

The logo for Enersight, featuring the word "enersight" in a white, lowercase, sans-serif font. The dot above the letter "i" is a small orange circle. The logo is positioned in the top left corner of a dark blue banner that features a network of glowing orange lines and nodes, resembling a globe or a data network, with a bright light source on the left side.

enersight

Alberta Royalty Framework & Royalty Incentives Review for Natural Gas

SPE Technical Luncheon
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The logo for WellSpring Petroleum Planning Software. It features the word "WELLSPRING" in a bold, blue, sans-serif font, with a small orange circle above the letter "I". Below it, the words "PETROLEUM PLANNING SOFTWARE" are written in a smaller, blue, sans-serif font.

WELLSPRING
PETROLEUM PLANNING SOFTWARE

Introduction

The new Alberta Royalty Framework has been in effect since 2008, and already has introduced several new royalty incentive programs to try and address dynamic market conditions.

This analysis looks at the impact and relevance of these programs to representative wells for Alberta:

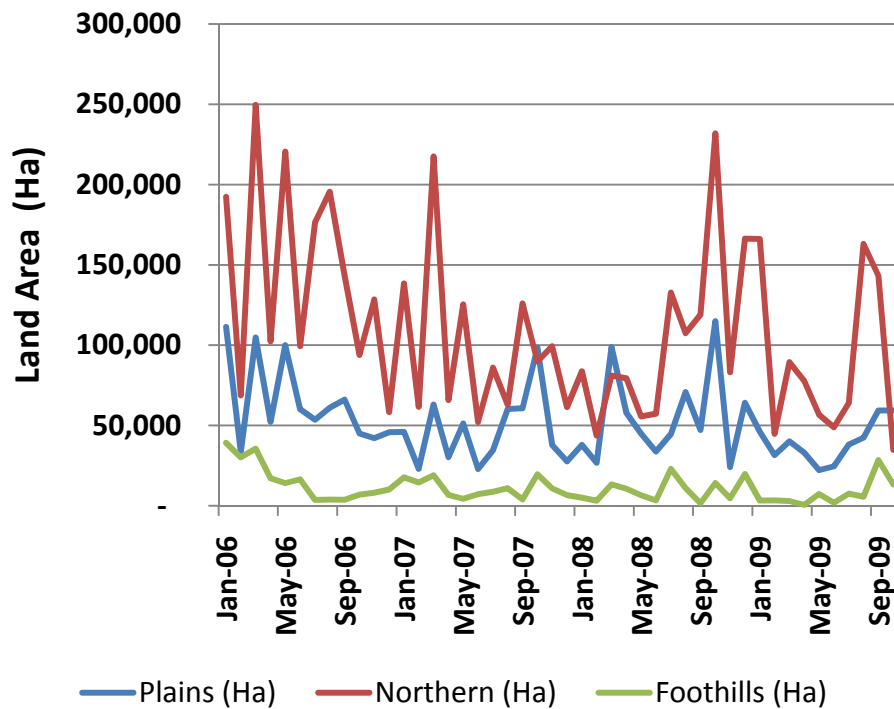
- **Shallow gas well with water production**
- **Vertical Deep Gas well**
- **Shale Gas well**

Enersight is a Calgary-based software company

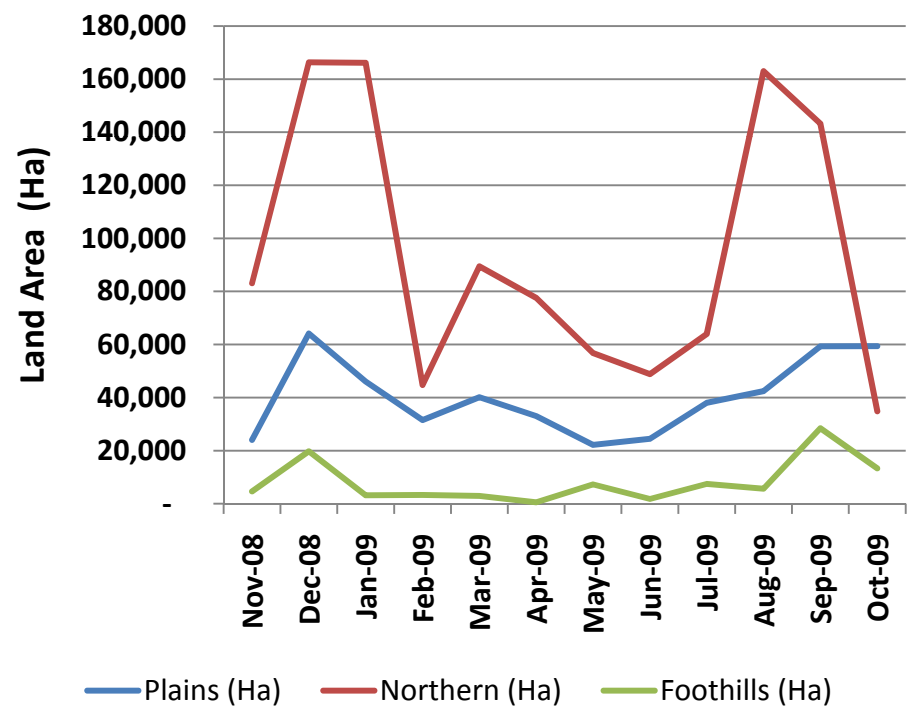
- WellSpring is an planning software tool for modelling the economic performance of conventional and unconventional development projects
- Maintain economic fiscal models for Canada, USA and some locations internationally

Alberta Land Sales Update

**Alberta Land Sales
(2006 to 2009)**

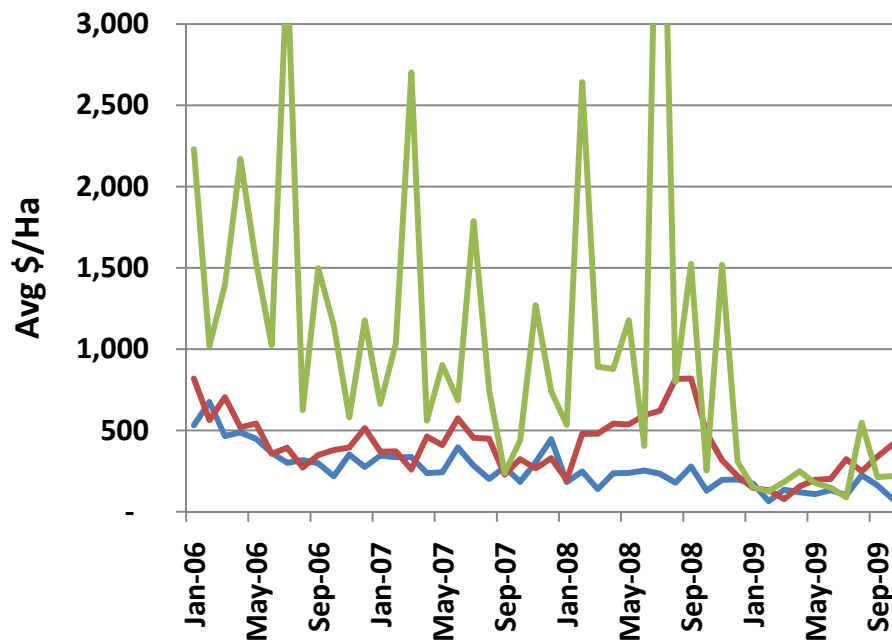


**Alberta Land Sales
(Last 12 Months)**



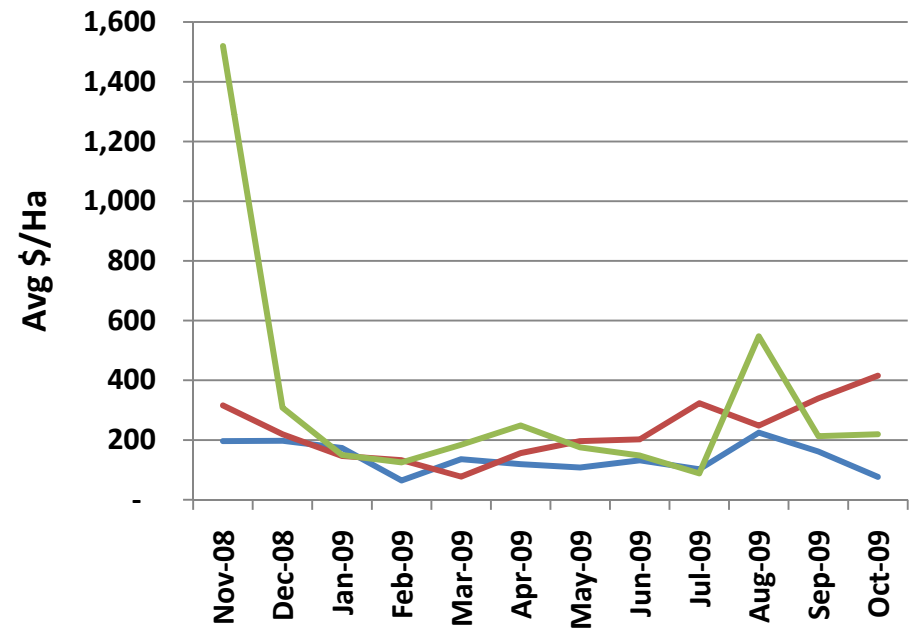
Alberta Land Price Update

**Alberta Average Land Price
(2006 to 2009)**



— Plains (\$/Ha) — Northern (\$/Ha) — Foothills (\$/Ha)

**Alberta Average Land Price
(Last 12 Months)**



— Plains (\$/Ha) — Northern (\$/Ha) — Foothills (\$/Ha)

Alberta Royalty Framework

- **Royalty/Tax Regime** based on Price and Rate of Production (natural gas 5% to 50%)
- **Transitional Royalty Program**
 - MD 1000 m to 3500 m, expires Dec-31-2013
 - Changes royalty tables – max gas royalty capped at 30%
- **Natural Gas Deep Drilling Program (NGDDP)**
 - TVD > 2500m, spud before Jan-01-2014, expires 5 years from FDD or credit consumed
 - Credit applied against royalties based on measured depth and type of well
 - Max Development \$8MM at 5917 m, Max Exploratory \$10 MM at 6583 m
 - Minimum 5% natural gas royalty rate
- **New Well Royalty Reduction (NWRR)**
 - Spud by Mar-31-2011, expires after 12 months production start or 500 MCFe
 - Reduces all royalties to 5%
- **Drilling Royalty Credits (DRC)**
 - Spud before Apr-01-2011, expires Mar-31-2011 (unused credits lost)
 - Reduces corporate royalties up to \$200/m drilled
 - Corporate Royalties are reduced based on 2008 royalty production, unused credits carry forward
 - 10% when over 25,000 boe/d to 50% when under 10,000 boe/d (10:1 BOE ratio)

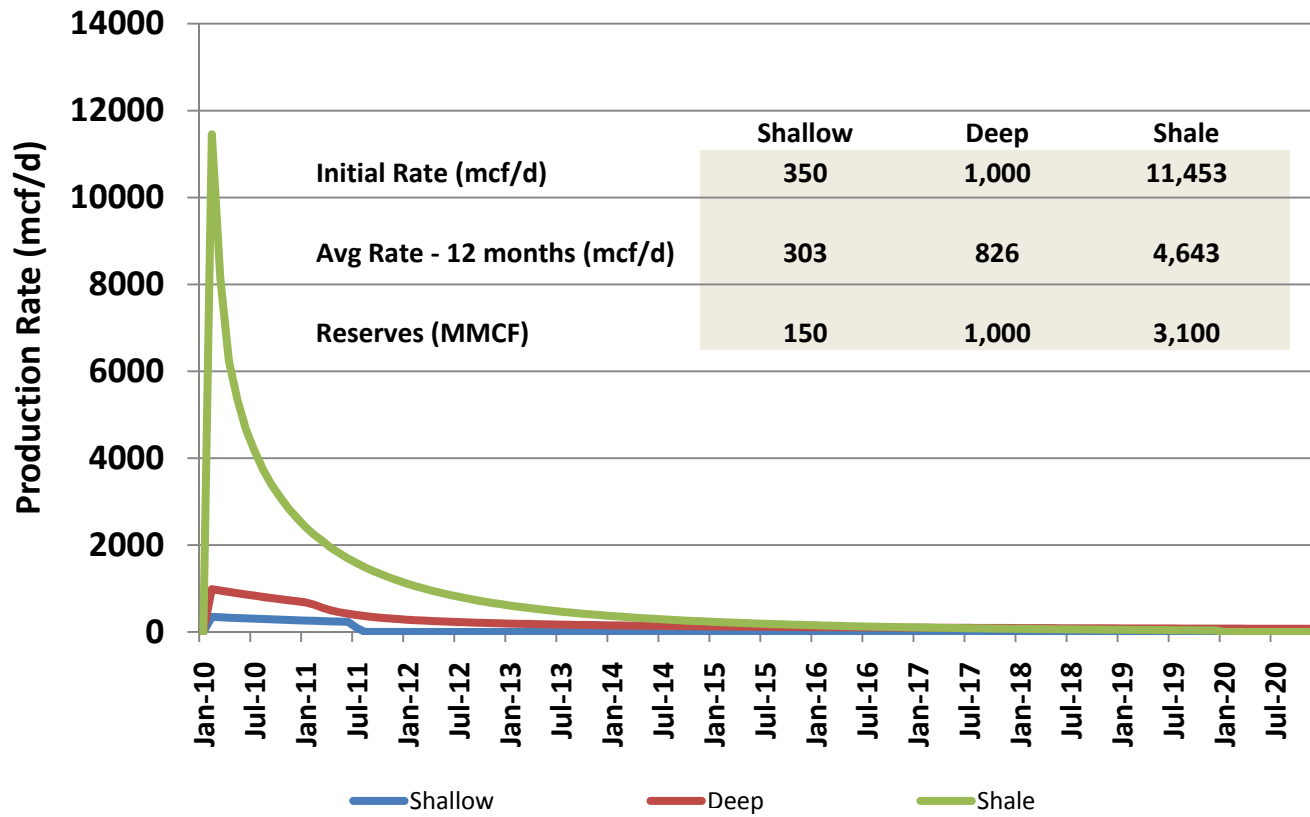
Alberta Representative Wells

Three representative wells were used to analyze impact of the royalty programs

	Shallow Gas	Deep Vertical	Shale Gas
Production			
True Vertical Depth (m)	800	2500	2800
Measured Depth (m)	800	2500	4700
Initial Rate (mcf/d)	350	1000	11453
Recoverable Reserves (bcf)	0.15	1.00	3.08
Water Ratio (bbl/mmcf)	267	0	0
Capital (\$000s)			
Drilling	180	1250	1800
Completion	40	500	4250
Facilities	180	250	300
Abandonment	40	50	50
Total	440	2050	6400
Opcosts			
Fixed (\$/month)	1000	3000	5800
Gas Variable (\$/mcf)	1.35	1.50	1.55
Water Variable (\$/bbl)	0.95	0	0

Well Production Curves

Well Production Rates

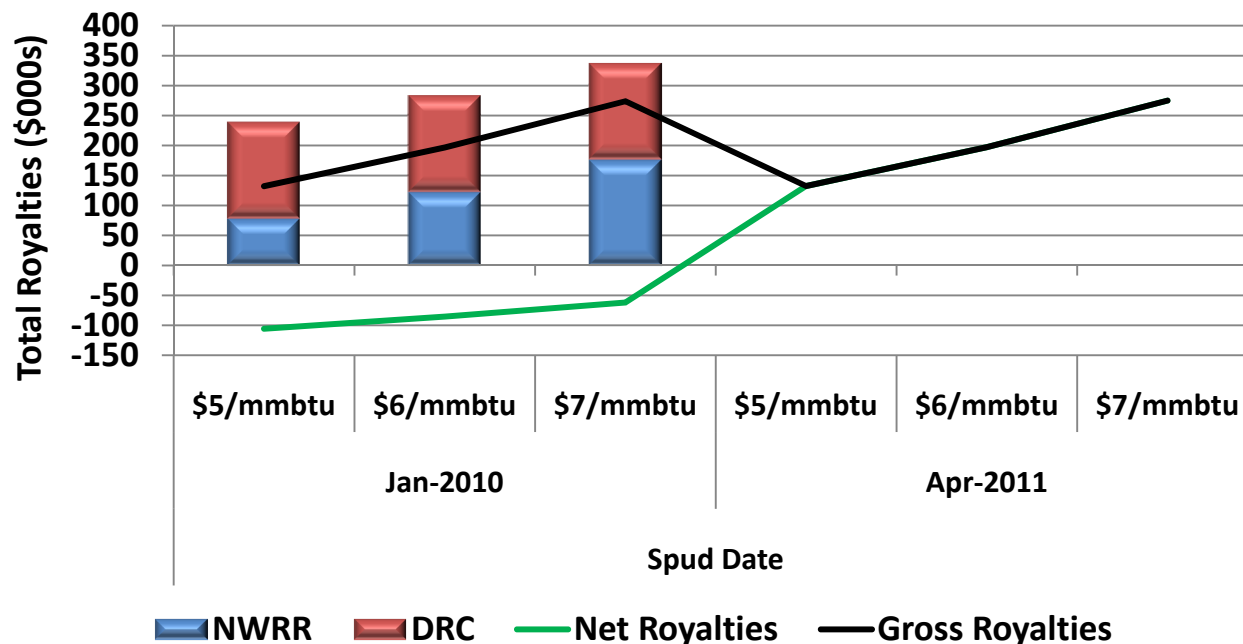


Royalty Incentives – Shallow Gas

The Shallow Gas Well only qualifies for the New Well Royalty Reduction and the Drilling Royalty Credit, both which expire Mar-31-2011

- During this period, the DRC pushes the total royalties to a negative number, subsidizing the drilling if you have corporate royalties to offset

Shallow Gas Well - Royalty Incentive Programs

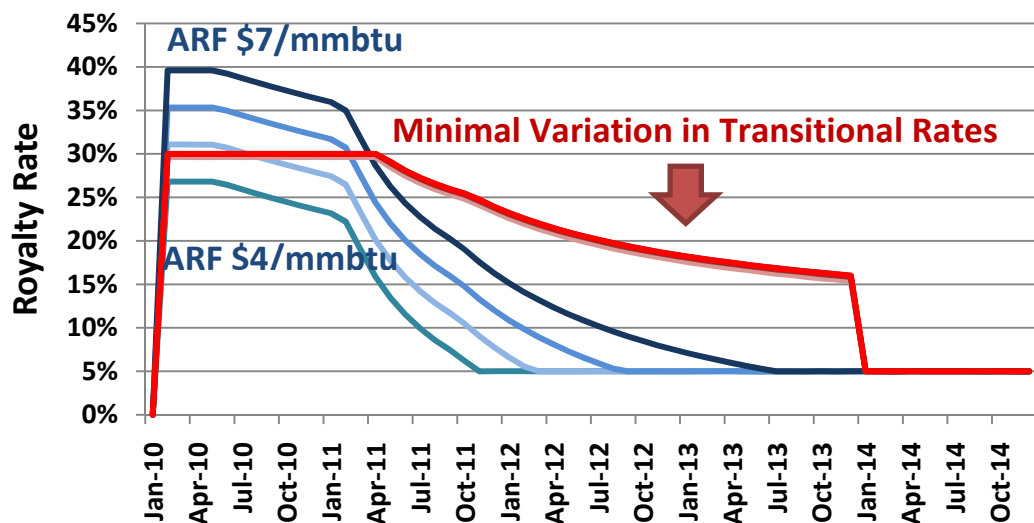


Transitional Royalties – Vertical Deep Gas

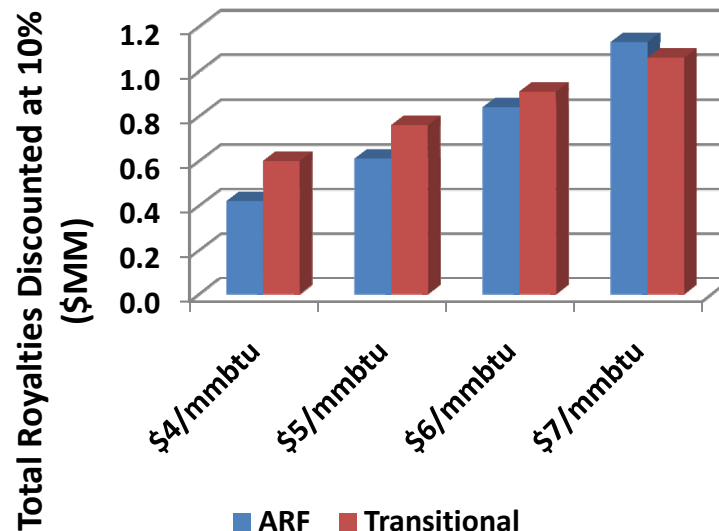
Only the Vertical Deep Gas Well qualifies for Transitional Royalties

- The standard Alberta Royalty Framework seems better than the Transitional Royalty Program for \$4 to \$6/mmbtu (excl. NWRR)

**Vertical Deep Gas - Royalty Rates by Fixed Price
\$4, \$5, \$6 and \$7 per mmbtu
ARF (Blue) vs Transitional (Red)**



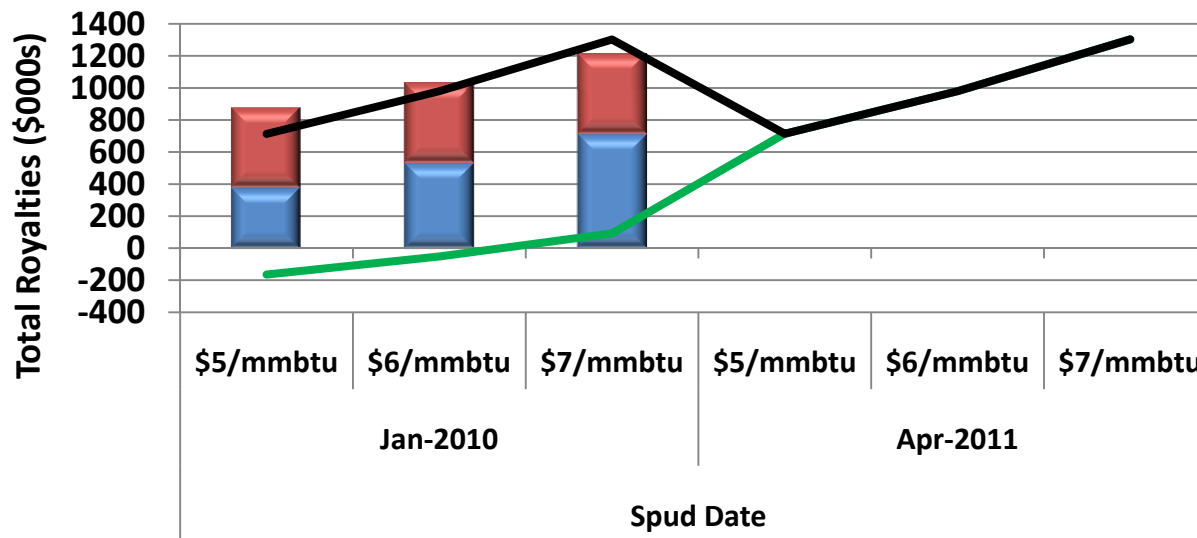
**Vertical Deep Gas
Discounted Royalties (@10%)
ARF vs. Transitional**



Royalty Incentives – Vertical Deep Gas

- The Vertical Deep Gas Well qualifies for the New Well Royalty Reduction and the Drilling Royalty Credit
- The Natural Gas Deep Drilling Program will also come into effect for wells with TVD over 2500 m
- The incentives effectively negate royalties for wells drilled by Mar-31-2011

Vertical Deep Gas - Royalty Incentive Programs

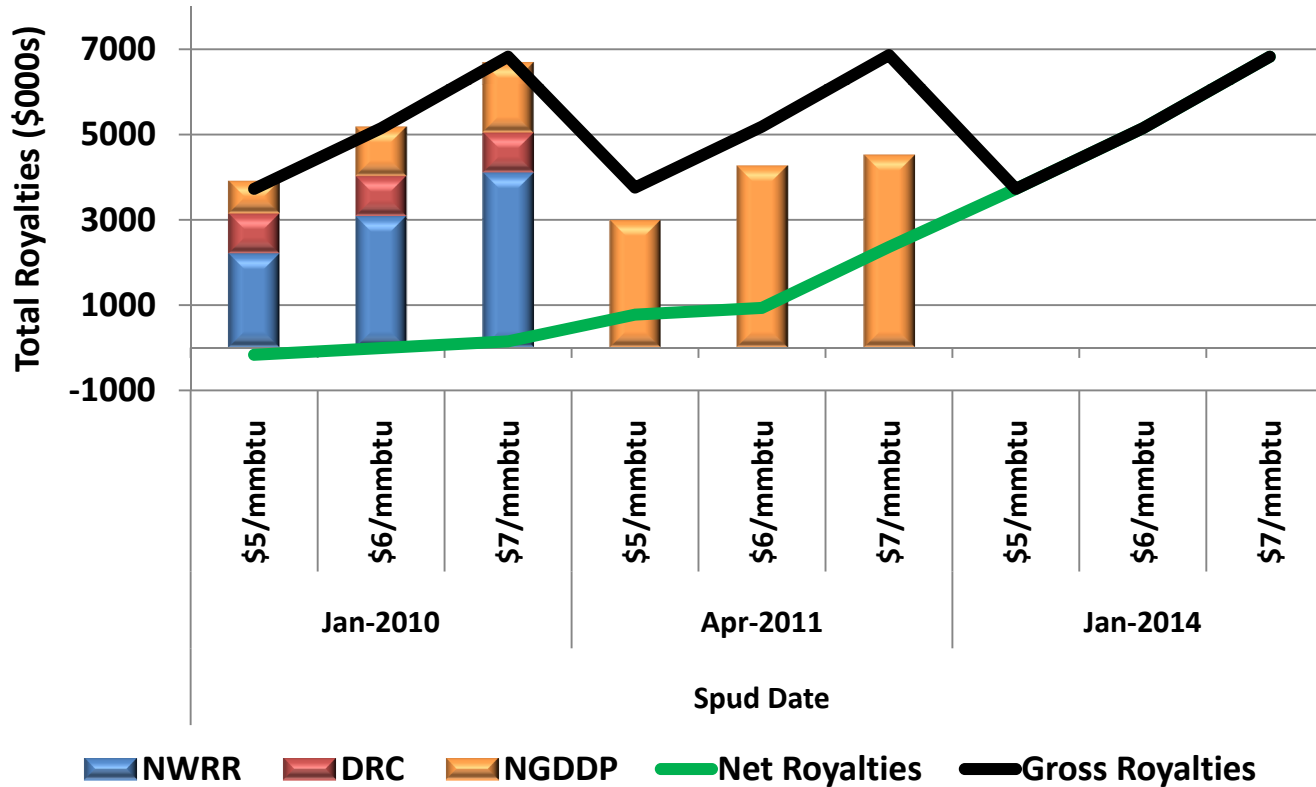


■ NWRR
 ■ DRC
 — Net Royalties
 — Gross Royalties

Royalty Incentives – Shale Gas

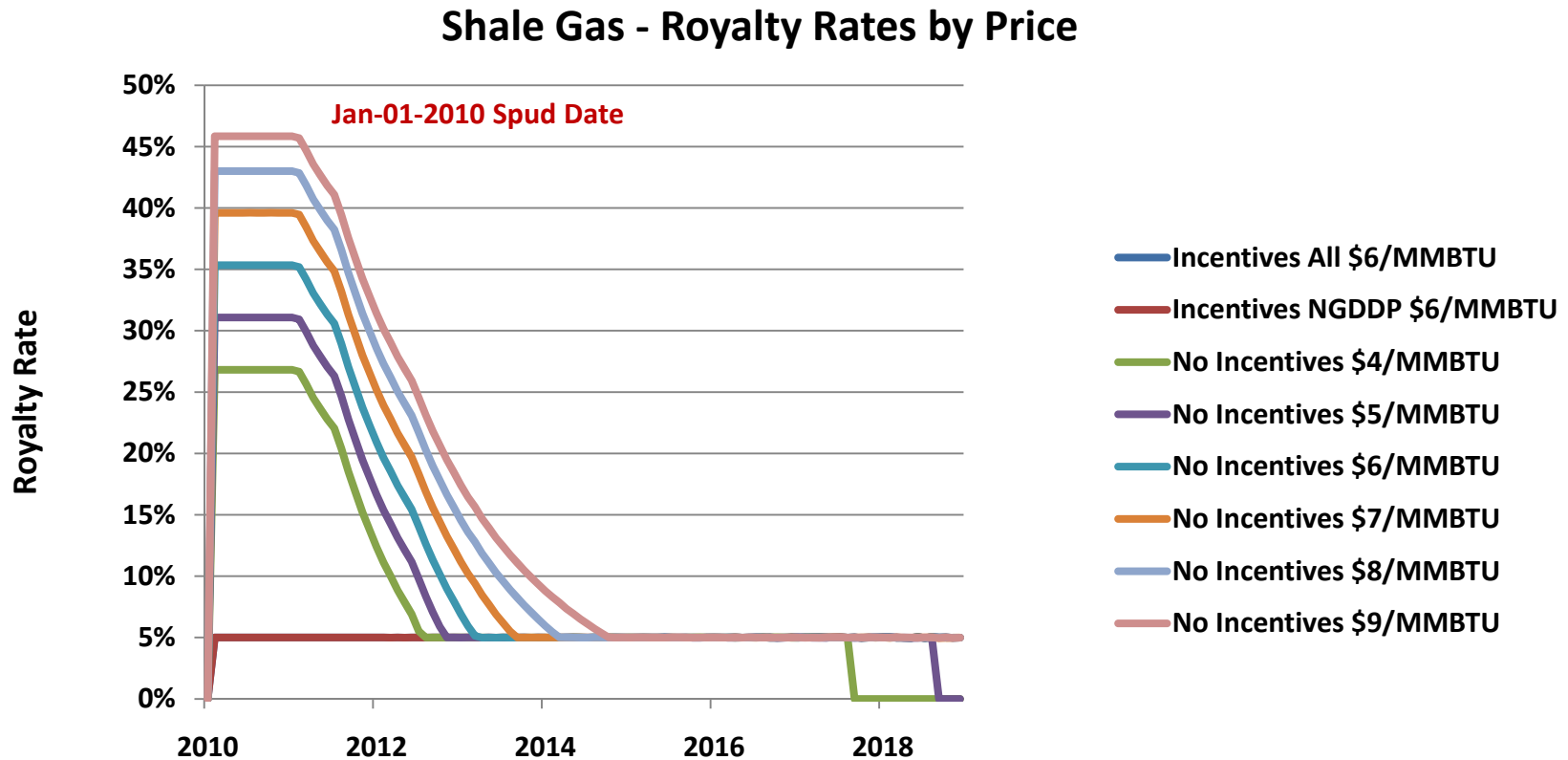
The Natural Gas Deep Drilling Program is the most influential program for Shale Gas (the NWRR reduces the impact of the NGDDP due to credits expiring)

Shale Gas - Royalty Incentive Programs



Royalty Rates by Price – Shale Gas

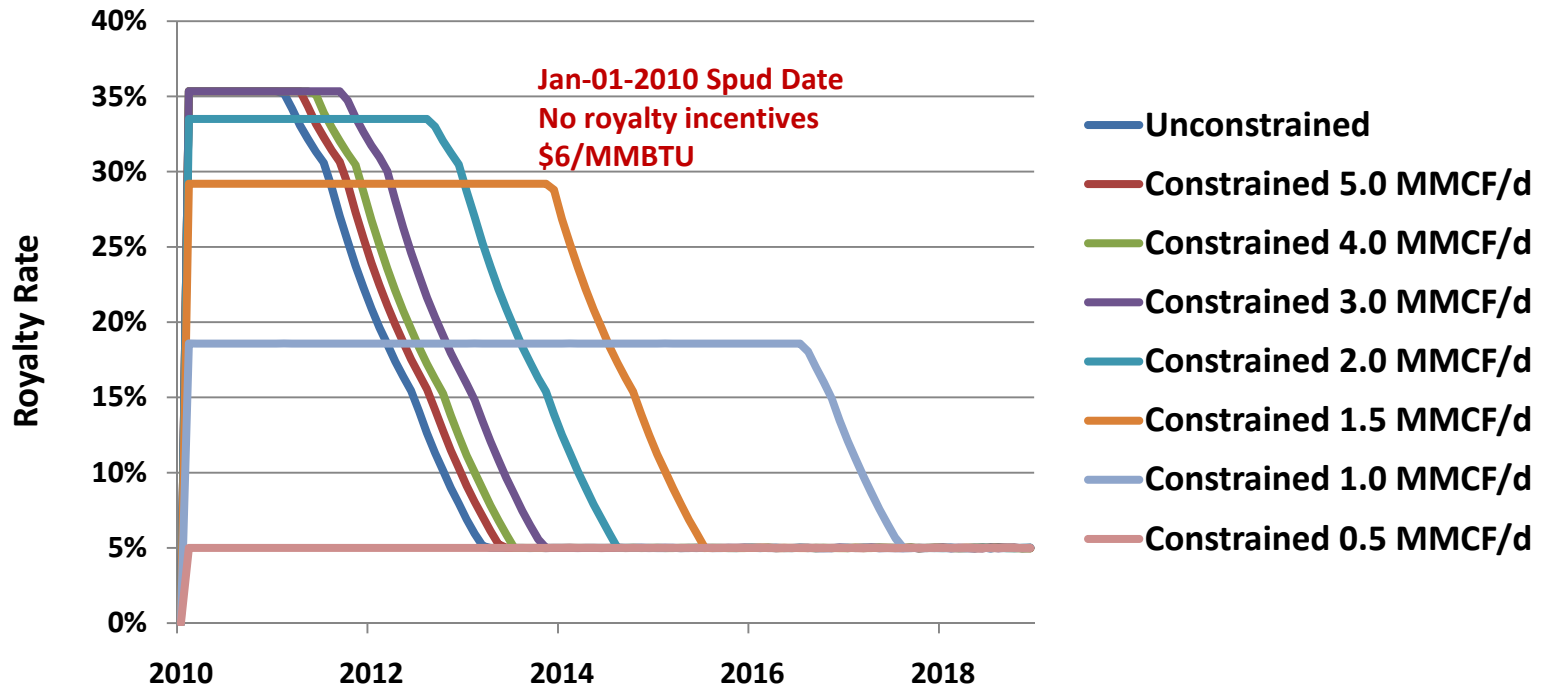
Royalty incentives drive royalty rates down to 5%



Royalty Rates by Production – Shale Gas

Curtailing production actually lengthens high royalty rates if producing at 3 MMCF/d

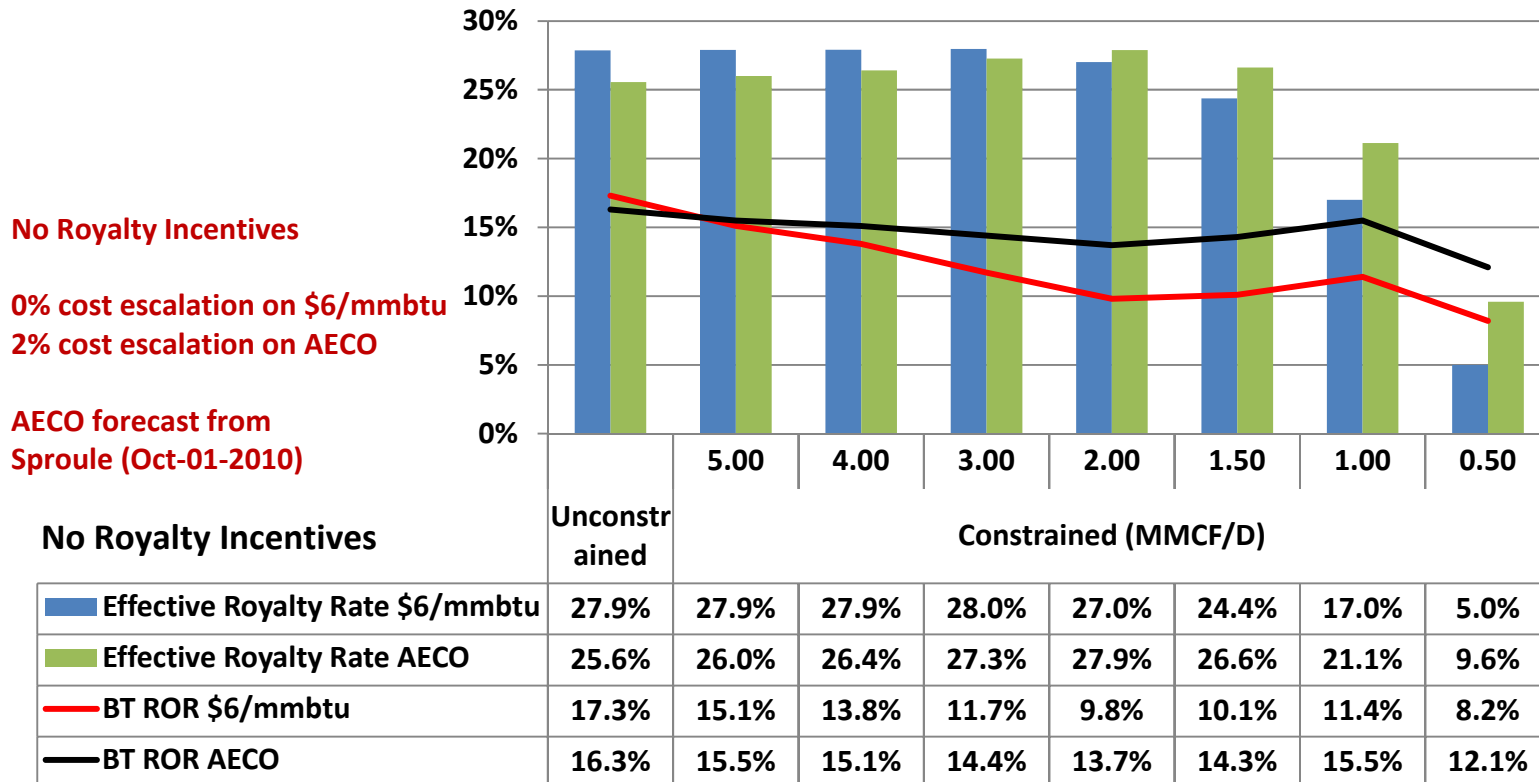
**AB - Royalty Rates
by Constrained Production Rate**



Curtailing Production Rates – Shale Gas

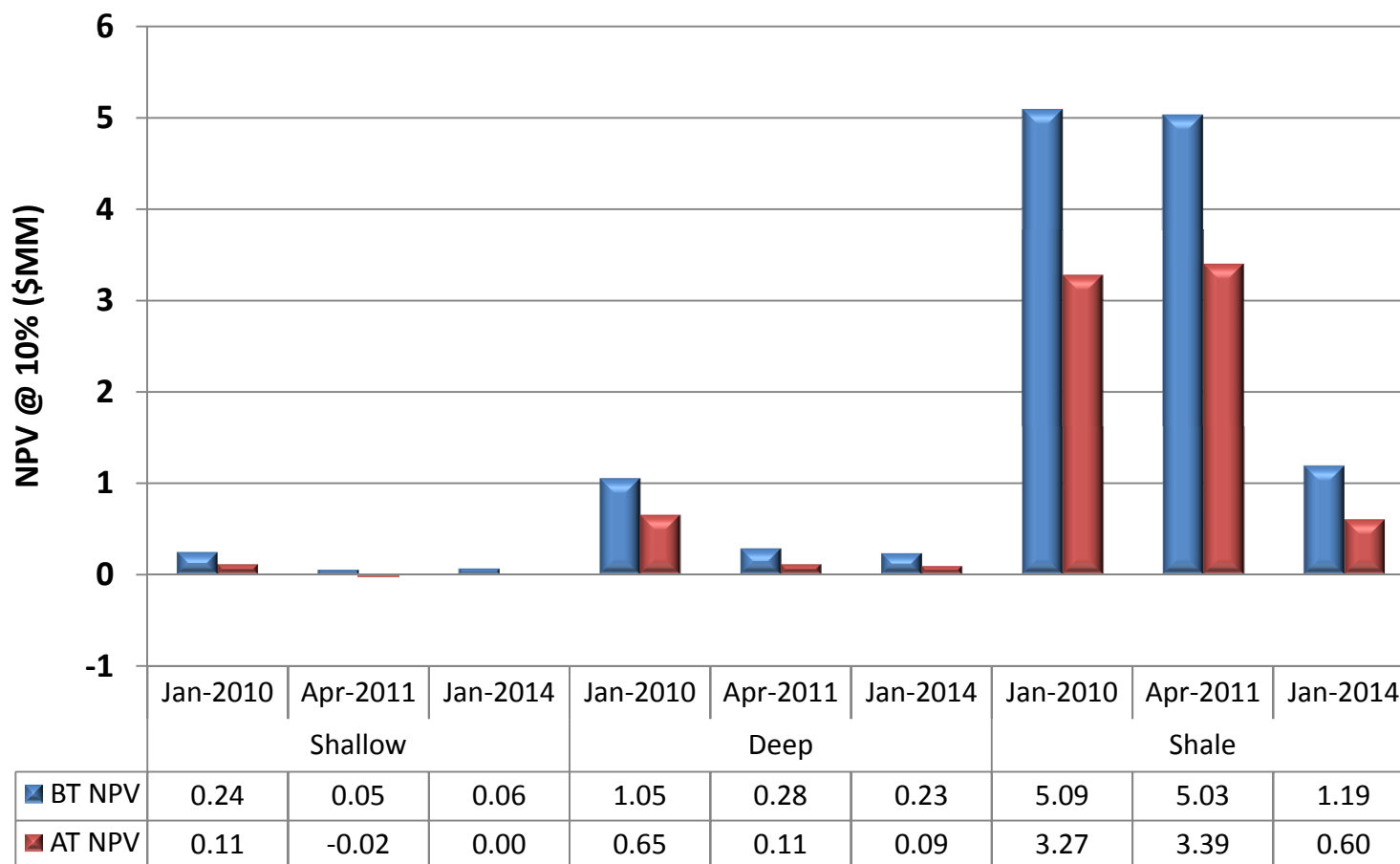
Deferring production would not appear to be of benefit in this example

Shale Gas - Managing Royalties and Returns By Constraining Production Rates



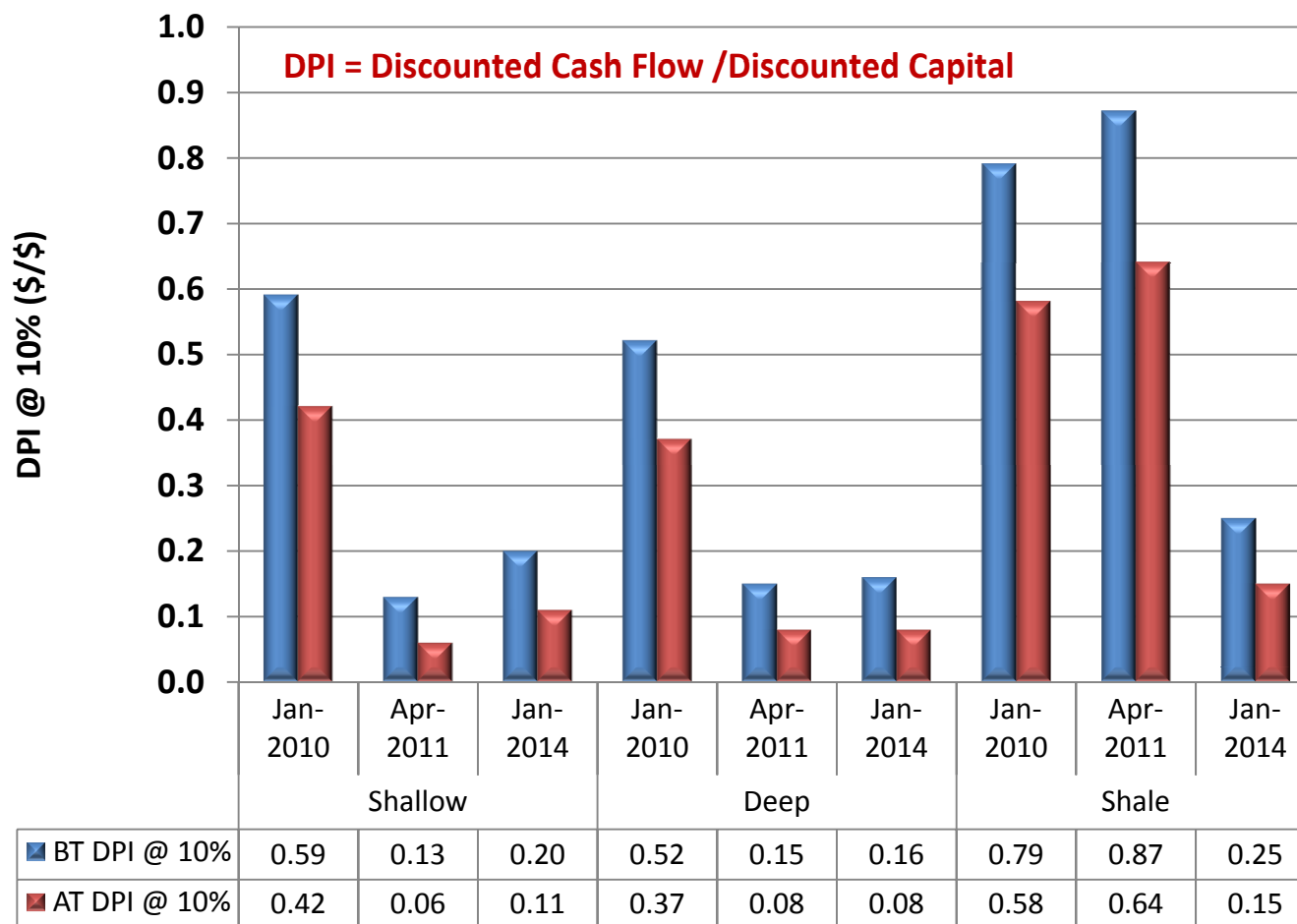
Well Economic Performance - NPV

NPV at 10% by Key Royalty Dates



Well Economic Performance – DPI

DPI at 10% by Key Royalty Dates



Royalty Round-up

- **Transitional Royalty Program** - seems unattractive in this price environment, especially while the NWRR is available
- **Drilling Royalty Credit** – strong incentive if you have other production to offset the royalties
- **New Well Royalty Rate** – good incentive but of limited benefit when working with the NGDDP
- **Natural Gas Deep Drilling Program** – most important incentive for shale gas or deep horizontal wells that qualify

Sproule Price Forecast

- The AECO C price forecast used in this analysis came from Sproule Associates

