



Market Analysis

Microhole Coiled Tubing Drilling Rig (MCTR)

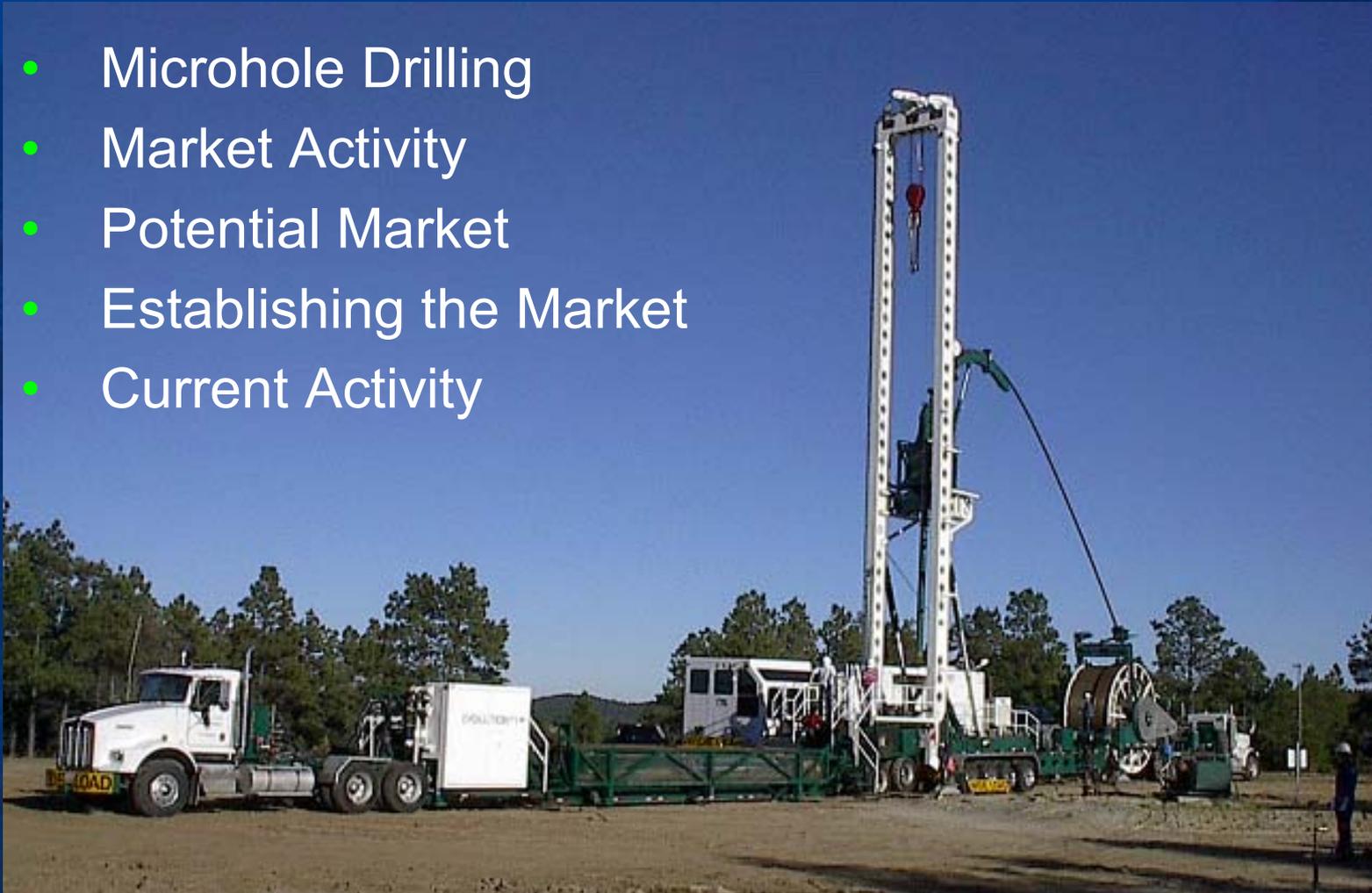
March 22nd, 2006

Bart Patton – Project
Leader



Outline

- Microhole Drilling
- Market Activity
- Potential Market
- Establishing the Market
- Current Activity



Microhole Coiled Tubing Drilling

What is it?

- Simply a completion that is smaller than a conventional completion.

Why Microhole?

- Lower cost alternative for exploratory drilling
- Lower cost for installation of monitoring wells

What makes it Cheaper?

- Reduced site preparation.
- Lower Completion costs
- Lower Mud Cost
- Low mobilization costs

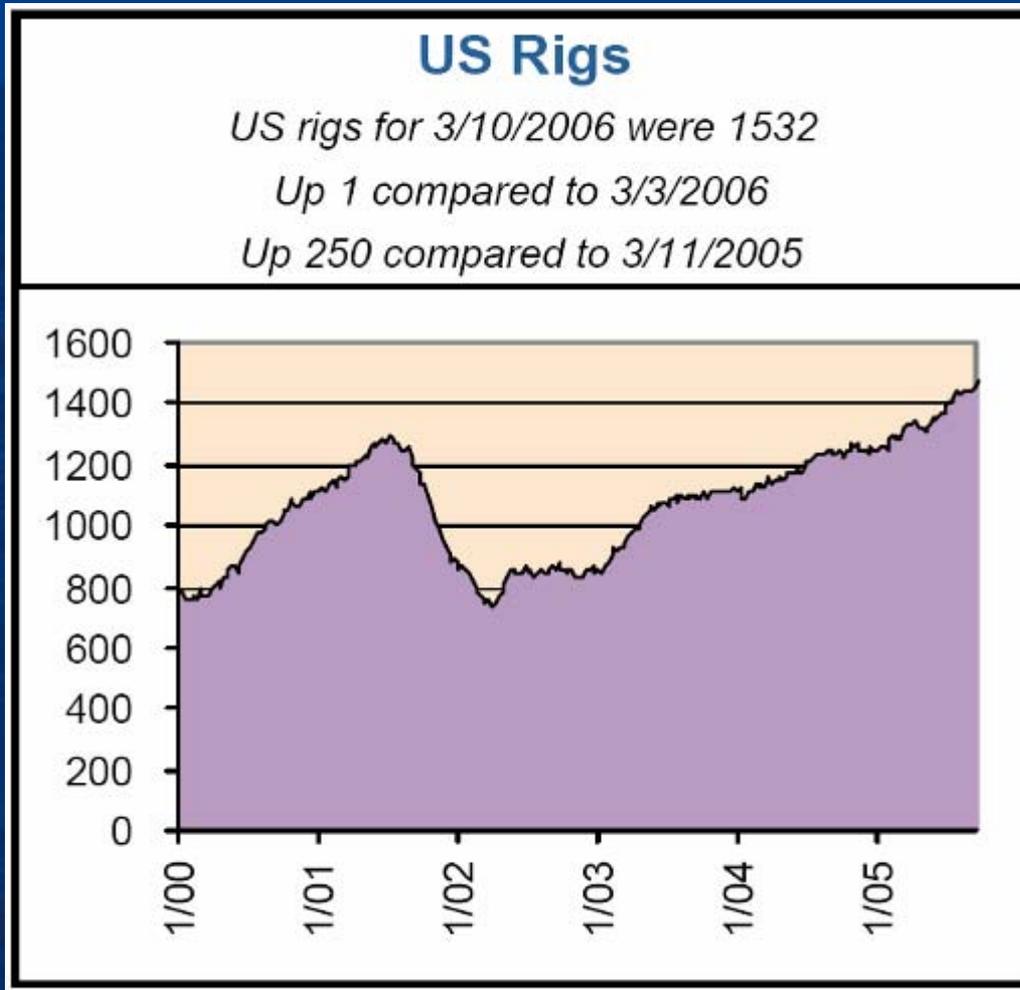


Market Activity

Currently drilling activity is on the rise

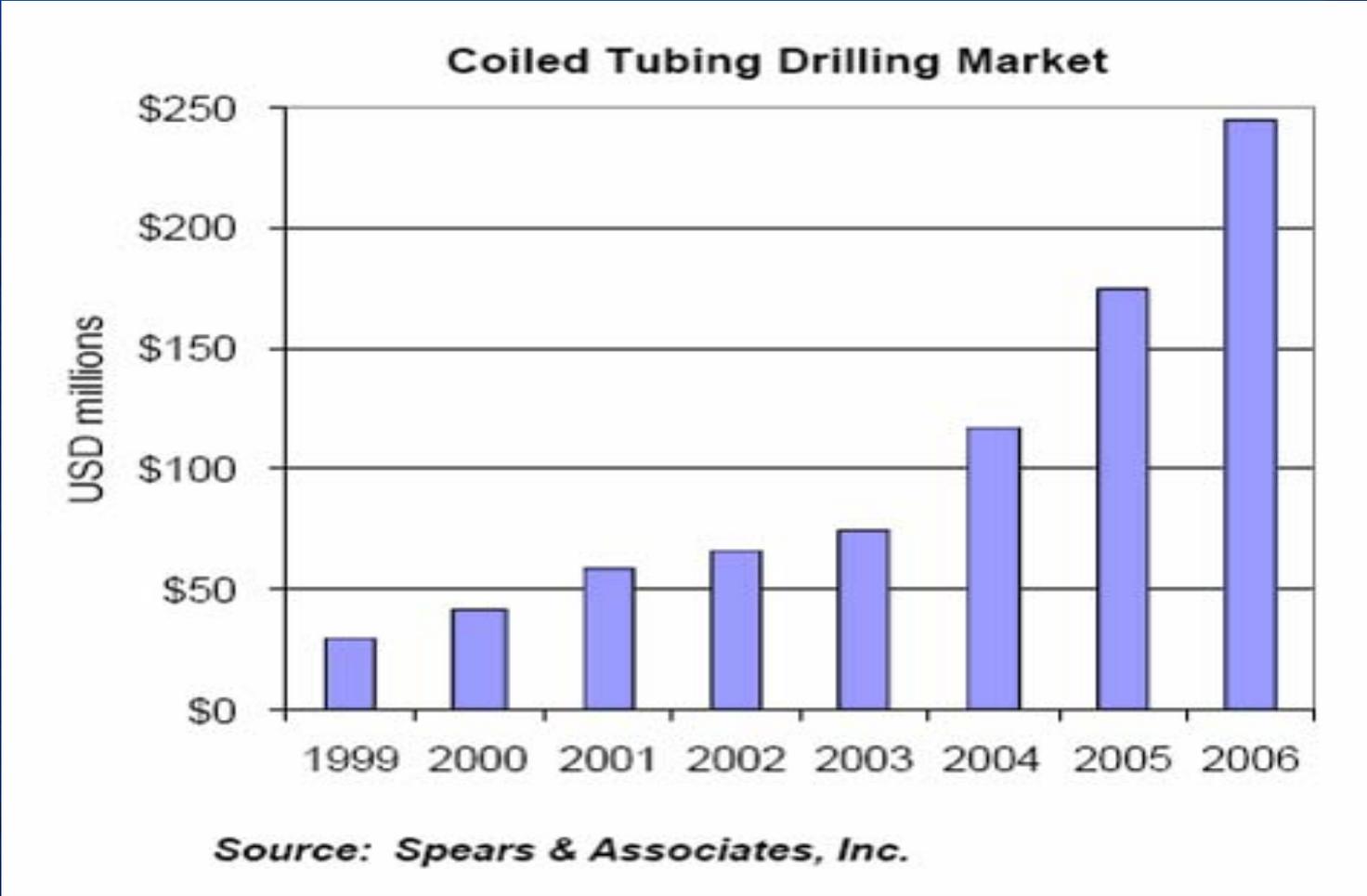
- Rigs have come out of retirement to attempt to meet demand
- Day rates continue to increase as rig availability is low
- Reduced availability is forcing operators to search for alternatives

Historic Rig Count

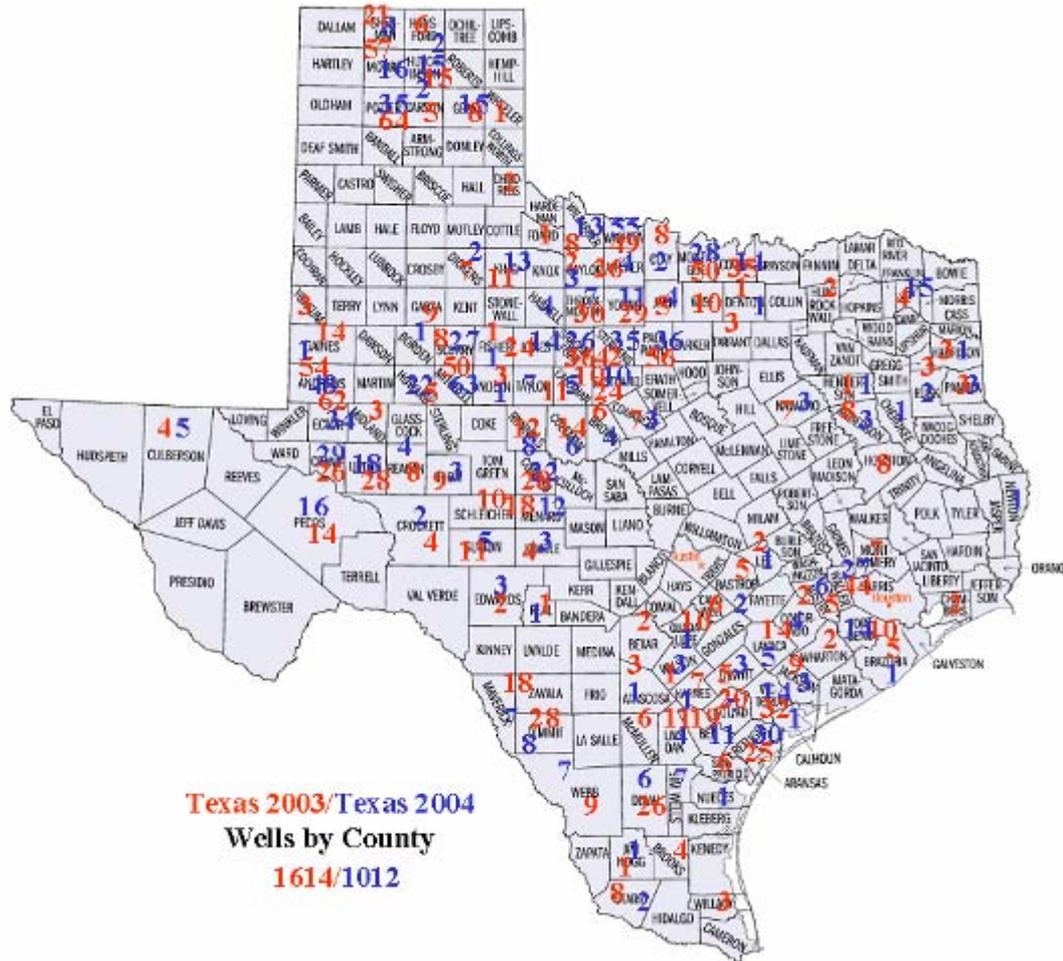


Source: BakerHughes

Effect on Coiled Tubing Drilling Market



Activity



Market Potential

Where is the US market?

Canada – It has been reported that 85% of all coiled tubing drilling takes place in Canada.

- Fast ROP
- Fast mobilization
- Safer Operation
- Overall reduced well cost

Why? – The formations and drilling conditions are a good match for coiled tubing drilling

Market Potential Cont'd

Identification of Candidate areas of operation

Not all shallow reservoirs are proper candidates for Coiled Tubing Drilling

- Formation type
- Access to location
- Hole size



Current potential operating areas

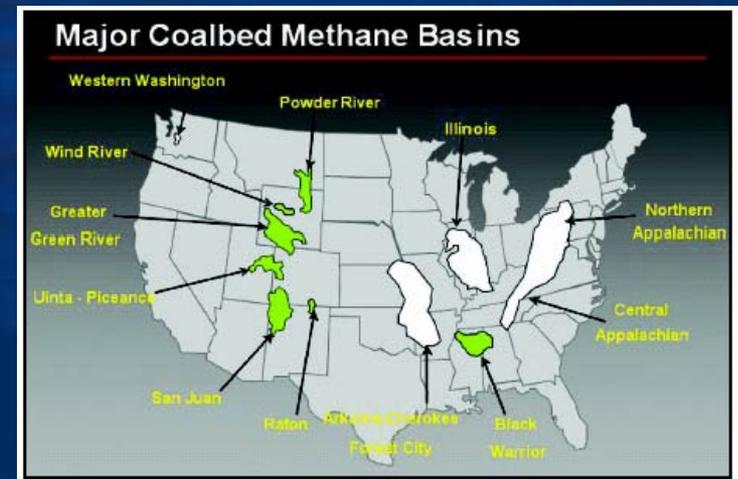
Rockies/San Juan Basin – Coal Bed Methane

Colorado/Kansas – Shallow Gas

Texas re-drills and side tracks in shallow shale reservoirs

Keys to Success

- Provide additional value to client
- Work within capabilities
- Build off of existing technology
- Maintain utilization



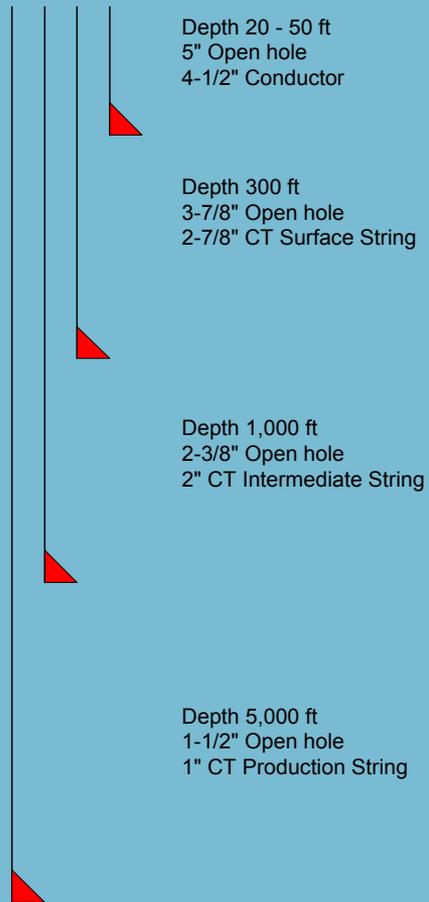
Establishing the Market

Acceptance in Market

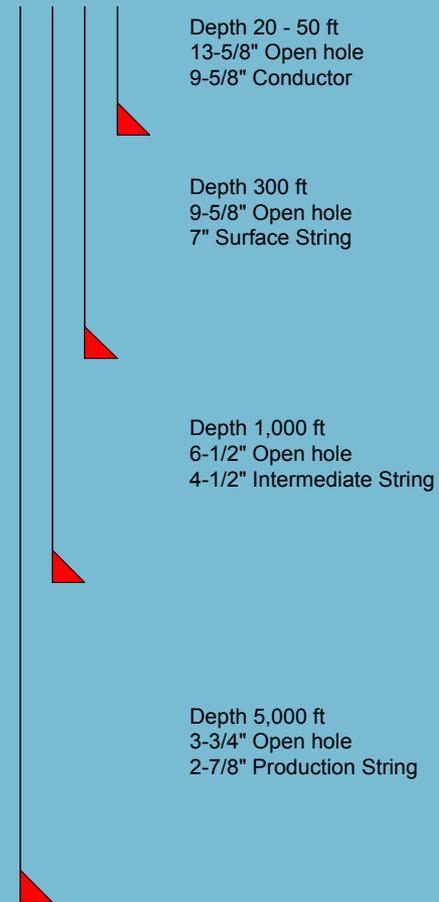
- Coiled Tubing needs to be accepted as a viable alternative.
- Reliability (Repeatability) must be established
- Easy to use (Familiarity in the market place)

Qualified Value Added Drivers

Envisioned Microhole Completion



Envisioned Slimhole Completion



Build off Slim Hole Technology

- Slim hole drilling has gone through market entry
 - Provides historical data
 - Provides drilling tools
 - Provides completion equipment
 - Provides production equipment
- Largest Microhole is the Smallest Slim Hole
 - Use this to introduce new tools
 - Establish techniques to drive hole sizes down

Current Worldwide CTD Activity





Alaska CTD - Continuous Improvement

SPE 67824 ... Key reasons for success of Alaska CTD program include:

Continuous utilization and a **repeatable job scope**, allowing rapid learning

Effective **performance-based service contracts** – expectations clear & simple, bonuses & penalties potentially large

The **right people** with the right expertise, technical innovation promoted, all possess attitude they can make a difference

The vision and **solid support of senior management** even in tough times / downturns



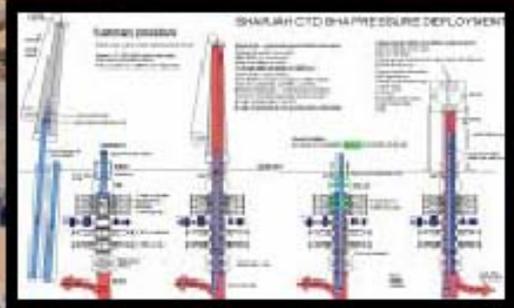


Four Phase Separators, Sampling Chokes

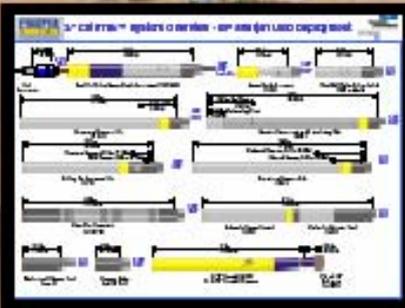
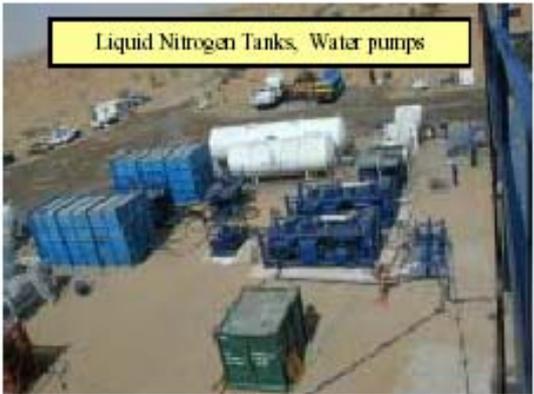


Sharjah Underbalanced Coil Tubing Drilling

Two Gas Compressors
50 psi to 300 psi to 9 MMSCFPD



Liquid Nitrogen Tanks, Water pumps



CTD Tower



Sharjah CTD Statistics

40+ wells reentered (some more than once)

Drilled 170 laterals

Pumped > 12 million gallons of liquid nitrogen

More than 1.2 MM man hours without LTI

Record for longest CTD lateral ... 5,273 ft

Non-Productive Time < 5% excluding 1st two wells

NPT = 22% on 1st two wells

Savanna Energy - Trailblazer

**Rig rate = \$12,000
USD/day**

Cost per foot = \$8.00 USD

**700m (2300 ft) avg depth in
2004**

**850m (2800 ft) avg depth in
2005**

2700 vertical wells drilled in 2004 with
year-end rig count of 20

2005 year-end rig count of 32

10 – 12 rigs drilling Coal Bed Methane
applications



Savanna Energy - Trailblazer

The Efficiency Multiplier

Hybrid CTD rig drills up to 2X faster

Charge only 25 to 30% higher dayrate

Drilling rig is 1/3 of running cost of drilling a well

Another 1/3 of cost is consumables (fixed per well)

“Other” 1/3 of cost is charged on time basis (rental items, consultants)

By reducing total drilling time, indirectly reducing customer “other” charges

“Conventional rigs cannot match this savings”



Trailblazer CTD

Rig # 20 is 2200m
double

But most Trailblazer
CTD Rig Reels hold:

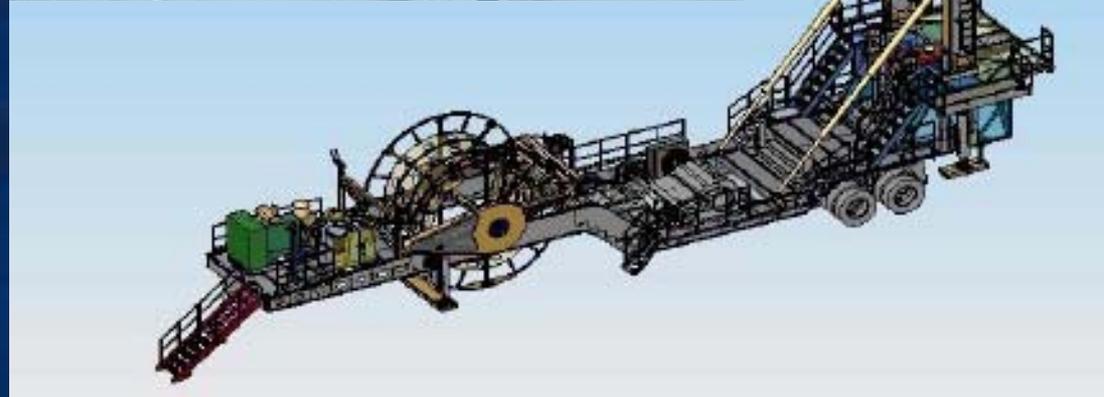
1650m of 2-7/8" CT or

1200m of 3-1/2" CT

Basic well is 6-3/4" hole

Using 4-3/4" BHA

Finishing with 4-1/2" Csg



Trailblazer CTD

1 Canadian Driller in terms of:

Wells Drilled per Rig

Meters Drilled per Rig

9 Truck Loads which is comparable to Super Single Light Rigs

Current design capable of drilling more than 75% of all Canadian wells



Ensign ADR-1000-CT

Hydraulic Single Rig + CTD
capable

1000m with Jtd Pipe or 3-1/2
CT

**1/3 fewer bending cycles on
CT**

Self leveling trailers



Canadian Coiled Tubing Drilling Activity



CTD Provider	CTD Rigs	Wells Drilled
Trailblazer	32 ... 42 by YE2006	2700 in '04
Precision	10 Big Wheel units	2641 in '03
Technicoil	4 ... 6 soon	257 in '04
Ensign	10 planned	?
Nabors	10 planned	?
Xtreme Coil	10 planned	Zero

Schlumberger Public



CTD Advantages

- **Fast trip times**
- **Can circulate continuously while tripping**
- **Constant low ECD's possible - continuous control in UBD Operations**
- **Efficient kick-off/casing exits**
- **High build rates up to 50 deg/100 ft possible**
- **Small diameter coil/BHAs ... ideal for thru-tubing reentry**
- **Telemetry independent of Drilling Fluid using wireline in coil**
- **Safer operations, especially in UBD applications**
- **Remote controlled & small footprint operations possible**
- **Less pipe handling - safer, less noise pollution, less spills**