

“Overcoming Adversity to Increase Production and Achieve Longer Pump Run Times in Parrylands E Block by Inventing Smart Lift Technology”

Presentation to AAPG SPE Joint Meeting in Trinidad

By: Greg Boyles, Managing Director

New Horizon Exploration Trinidad & Tobago, Ultd.

May 15, 2019



Trinidad

Lighthouse at Toco

Contents of our story...

- Where & Why we drilled in Trinidad
- What we got AND the huge Challenge we faced
- Chasing greener pastures, as in, explore somewhere else (*if at first you don't succeed*), OR,
- **Invent Something** to overcome the challenges you face; AND in the end,
- End-up with a Sustainable Development plus a Solution that helps others too.



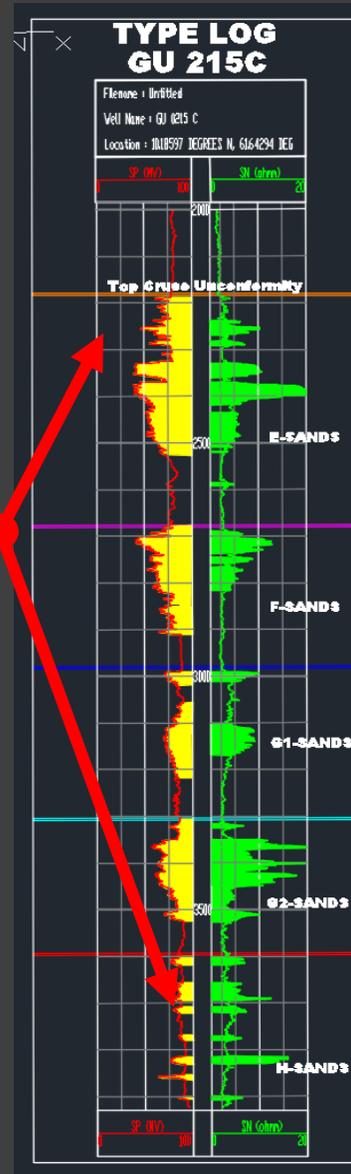


Where & Why we drilled

Location Onshore Trinidad
 Parrylands-Guapo Blocks
 2100+/- acres SW Trinidad

Reason for drilling...

- Shallow Miocene Sands
- >200' of Net Oil pay
- Substantial oil in place 130+ MMBOIP
- Initial flow rates >100s of BOPD.



What we got

Lots of Oil that had to be pumped

Net Oil Sand (NOS) 100-350'

OOIP Guapo and Parrylands >200MMBO

Porosity 34% with .25-1 Darcy of Perm

15 API 4200CP @ 99F

PLUS a huge Challenge

Pumping the Wells

Fine unconsolidated sands produced with the oil created very “Dynamic Well Conditions” – flow brings sand, as the sand migrates it fills the casing and plugs near well perm which changes entry rate unexpectedly Sustained Daily Flow Rates tended to be low <8 BOPD even with a BHP of +520 psi.

We frequently “dry pumped” damaging PCPs. Pumpjack rod pumps quickly wore out and became stuck. We frequently “sanded up” and “gas locked” and burned out PCPs while compressing gas through the stator. We were tricked into thinking there was nothing to produce.

PUMP RUN TIMES 14-30 days - Frequent Winch Work & Costly Operations



What we briefly considered

To pursue greener pastures *(abandon the site and look for something easier to develop)*.

The decision – Invent what we needed to be successful

Create hybrid-technology (PLC with Communication) that would give us remote control and a web-based platform that would support application software that would automate our operation and pump wells based on real-time fluid level to a level in the well that would not bring in as much sand. *“Only harvest the amount the well is willing to give”*.

Key elements of the process of this invention

Hardware

First, we Imagined and listed all of the things we wanted to automate.

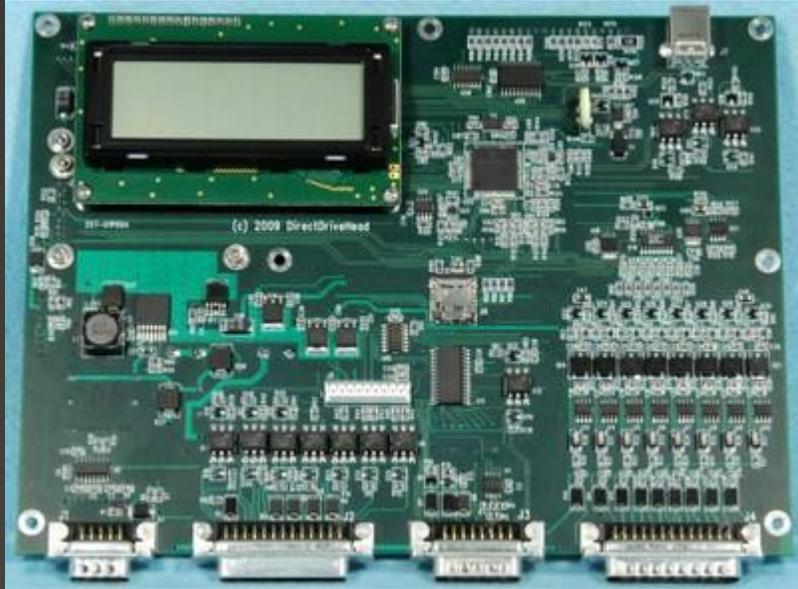
Then, Designed hardware technology with more capability than to simply satisfy the initial wish list for scalability and purpose to create a “universal platform”.

Software

1. Write code to create Precision Pump Control based on real-time fluid level by using permanent down hole pressure sensors to calculate fluid level in real time and use the data to create a PID loop for pump motor control. Eliminate pump failures and sanding up.
2. Automate other well site processes and provide warning and fault conditions to reduce HSE risk.
3. Data-log well & reservoir conditions to better understand the nature of each well in order to overcome the challenges of each to maximize the potential from each.
4. Deliver the Data and Remote Control to Virtual or In-house servers and enable access to data from anywhere by authorized personnel to use.
5. Reduce lease operational cost by reducing human error.

Because of Hardware Flexibility the Software Development continues to Expand into the Universe.

How it works...



by Controlling Variable Frequency Devices
to changes hertz which in turn varies a motors speed

Inventing a solution to pump better lead to other Unintended Consequents and Benefits.

Helps our Production & Maintenance Team Identify

Parted Rods and thrown belts

A Hole in the production tubing and flowlines

A Stuck Pump, A Bad Bearing, A Closed Valve

Predict Pump Wear and aids in Pump Sizing

See Tank Levels, Calculates Volumes and provides high-and-low level alerts

Meter flow, Protect Lines and Vessels from over pressure

Controls Transfer and Chemical Pumps

Basically Monitors and Controls everything in the field

Helps our Electrical Team Remotely Identify

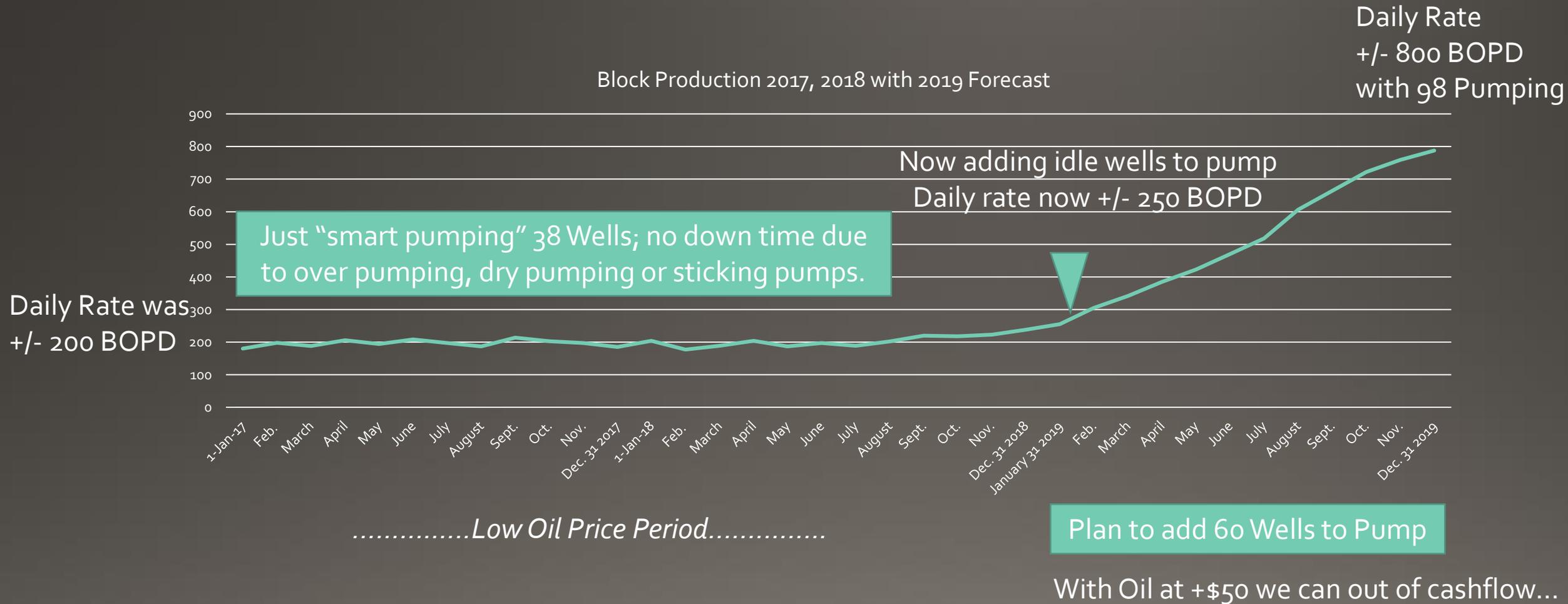
Motor Ground Faults (bad motor on artificial lift systems or others in the field)

Low Voltage, High Voltage and No Voltage Areas

See Amps, Current, Motor Voltage, Line Voltage, kW and Hp usage



Production & Forecast with Activity Schedule





Lets Login from UWI to remote wells in Trinidad

<http://SmartPumper.com>

Grow 30% More for 30% Less
Funny, SPE Paper by Staatsoile stated Smart
Pumper produced 18-57% more oil and reduce
LOE's by a similar range when compared to
"others" claiming to be "smart".



Automated Plant Feeding
Water Quality Monitoring & Control System

It delivers more unintended benefits

1. Web Based Interface to Control and Monitor all your operational aspects associated with irrigation and plant feeding
2. Provides Alerts, Warnings and Faults for any condition
3. Control Irrigation Pumps and Vary Speed
4. Control Chemical Injection Pumps and Regulate injection quantity in harmony with Water Supply
5. Provides low inventory warnings to supplier and operator
6. Monitors Water Quality pH, ORP, Salinity, other
7. Delivers Organamax™ (a naturally occurring soil bacteria combination) into the irrigation system and/or hydroponic flow that boosts plant production by up to 30%, in less time, using less fertilizers



Happy Grower in Santa Crews

Invitation – *Come to Parrylands*



See Seeps

See Outcrop of [Morne l'Enfer](#)

See Port of Spain and Venezuela

See Automated Well Performance, Work Overs and Drill Outs

Ponder your future from the deck

Closing Thoughts...

Oil Entrepreneur

a person who organizes a business and takes on financial risks to profit from the oil patch either by producing oil and/or providing a service for it.

Some may find success in the first well you drill and others by inventing a solution that overcomes a challenge. In either case never giving up (*persistence*) will lead to success in areas others walked a way from.

*Think of yourselves as unconventional
and frack a shale!*



Thank You