

Tech-Flo Consulting LLC

Production Equipment & Artificial Lift Solutions

About Tech-Flo



Founded in 2006, Tech-Flo is a United States based, privately owned company that designs, manufactures, sells, services and distributes a new, highly efficient jet pump (US Patents Pending & WIPO/PCT registered) and related ancillary equipment.

The unique jet pump was designed to be a competitive means of lift for all types of producing wells, inland and offshore. The jet pumps ability to produce modest to large volumes of sub-surface formation fluid and gas that contain a moderate to high solids content give it a marked advantage over other forms artificial lift.

In 2012 and 2013 Tech-Flo was featured by Inc. Magazine as one of the fastest growing 5000 business in the United States, ranking 531st overall, 23rd in energy and 7th in the Houston, Texas area. Tech-Flo was also recognized in 2014 by the Houston Business Journal as one of fastest growing 100 companies in the Houston area ranking at 91.

With over 100 years of combined experience in hydraulic lift, niche jet pump applications and engineering, Tech-Flo is considered one of the most technically viable, privately owned artificial lift companies today.

Tech-Flo Areas of Operation



Areas of Work Experience: North, Central & South America, Russia & Former Soviet Countries, Oman, Iraq, India, Western Europe, The United Kingdom, Baltic and Barents Sea Areas.

Inland & Offshore Total Production Solutions



Product & Service Offerings

- TFC Hydraulic Jet Pumps
- TFC Surface Jet Pumps
- ASME code and non-code vessels and process equipment
- Hydra-Cell Seal-less pump technology
- Baker Hughes Hpumps™
- Multiplex Pumps & Equipment Packaging
- Focus Production Measurement System
- Field Services, Well Site Consulting & Project Management
- Artificial Lift well design and optimization
- Engineering, Tool Design & Testing

TFC Hydraulic Jet Pumps

The Most Versatile Form of Artificial Lift

Patent Pending, US and INTL

TFC Jet Pumps

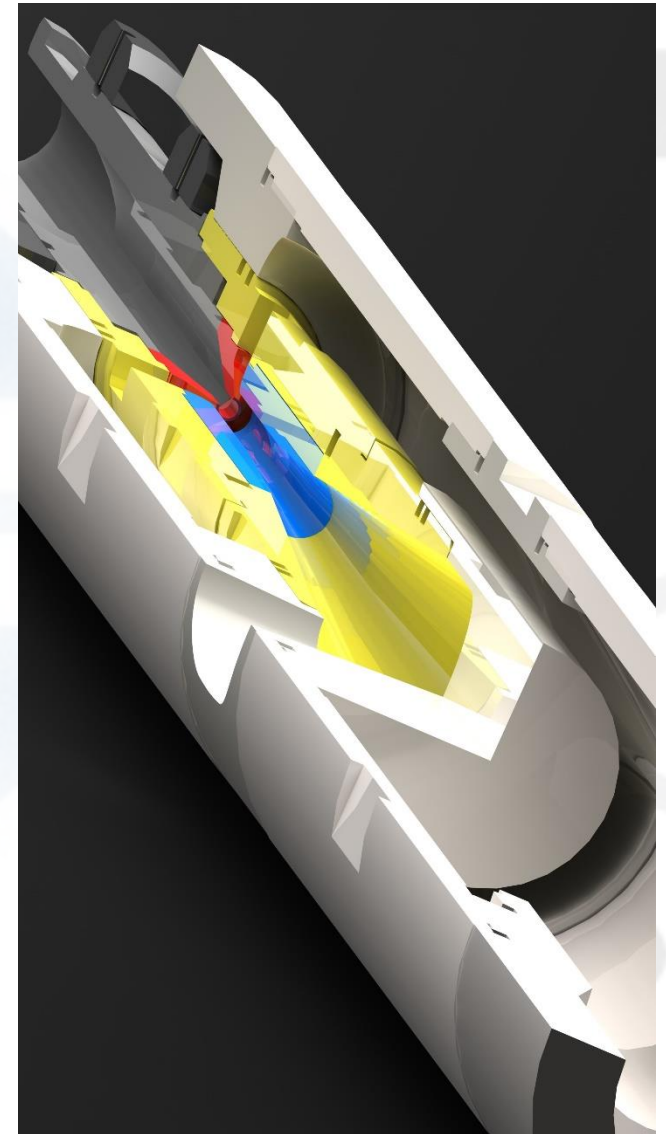


- TFC 1.66
 - Production Rates up to 1,700BPD
 - Applications
 - Slimhole with concentric tubing
 - Bad Casing
 - Gas Well Dewatering
 - Sliding sleeve/Cavity pump for 2-3/8 tubing
- TFC 2.20
 - Production Rates up to 4,000bpd
 - Applications
 - Sliding Sleeve/Cavity Pump for 2-7/8 & 3-1/2 tubing
- TFC 3.10
 - Production Rates up to 10,000bpd
 - Applications
 - Tubing conveyed housing for 2-3/8 – 4-1/2 tubing
 - Frac flowbacks
 - Highest volume and most efficient pump
 - Sliding Sleeve/Cavity Pump for 4-1/2 tubing and up

**Note: All pumps are designed to be run in conventional flow or reverse flow.*

Jet Pump Advantages

- No down-hole moving parts
- No work over rig or wire line unit needed for servicing.
- Widely scalable and efficient performance (15bpd – 10,000bpd) with the same bottom hole assembly by exchange of nozzle and mixing tube only.
- High volume production. Get to the pay faster post frac.
- Extreme solids and high GLR handling performance
- Can be installed in remote locations without electricity or infrastructure inland and offshore
- Wellbore, flow lines and facilities can be completely chemically treated for paraffin, scale and corrosion via jet pump power fluid
- No gas locking, low to high API suitability
- Ability to run pressure and temperature down hole memory gauges that are easily retrievable and protected inside the jet pump housing
- Wider range of applications than any other form of artificial lift



Increased Efficiency

- Increase flow areas, direct fluid delivery to the draw down point, and TFC's EDM machined patent pending outlet sub gives the jet pump a marked advantage over the competition & other types of AL.

Jet pump inflow area comparison



Jet Pump Inflow vs. Outflow Areas



Pump	Inflow Area (in ²)	Outflow Area (in ²)	Outflow/Inflow	BPD from Outlet @ 30ft/s
Tech-Flo	1.3486	3.9600	294%	12698
Manufacturer X	0.7300	1.2370	169%	3967
Manufacturer Y (2.875)	0.6250	1.0660	171%	3418
Manufacturer Y (2.375)	0.3300	0.6723	204%	2156

Jet pump outflow area comparison



TFC Surface Equipment

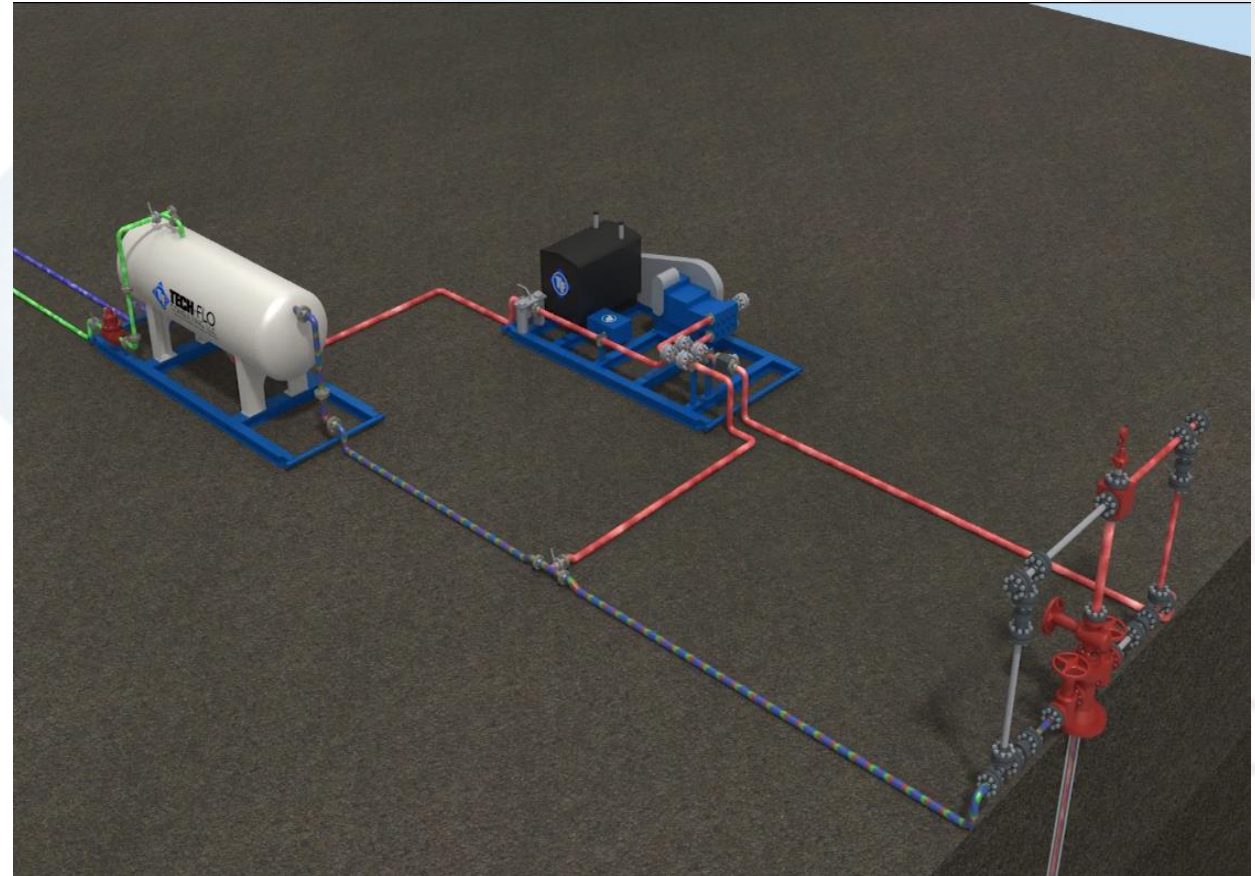
Power Fluid Sources & Separation

- Free Water Knockouts
- 2 or 3 Phase Separators
- Heater Treater
- Gun Barrel
- Stock Tanks
- Frac Tanks
- Flow Iron
- Filtration & Measurement Skids



Power Fluid Injection Units

Every Jet Pump has to have a pump on the surface to deliver power fluid to the down hole tool. These pumps can be operated by electric, natural gas or diesel powered drivers. This gives the jet pump system flexibility over other types of artificial lift where infrastructure may not be available.



Weatherized Skid Packages

All of Tech-Flo's surface pumping systems can be housed for your specific environment and requirements. This can be extremely beneficial for offshore applications and areas with cold and arid desert like climates.

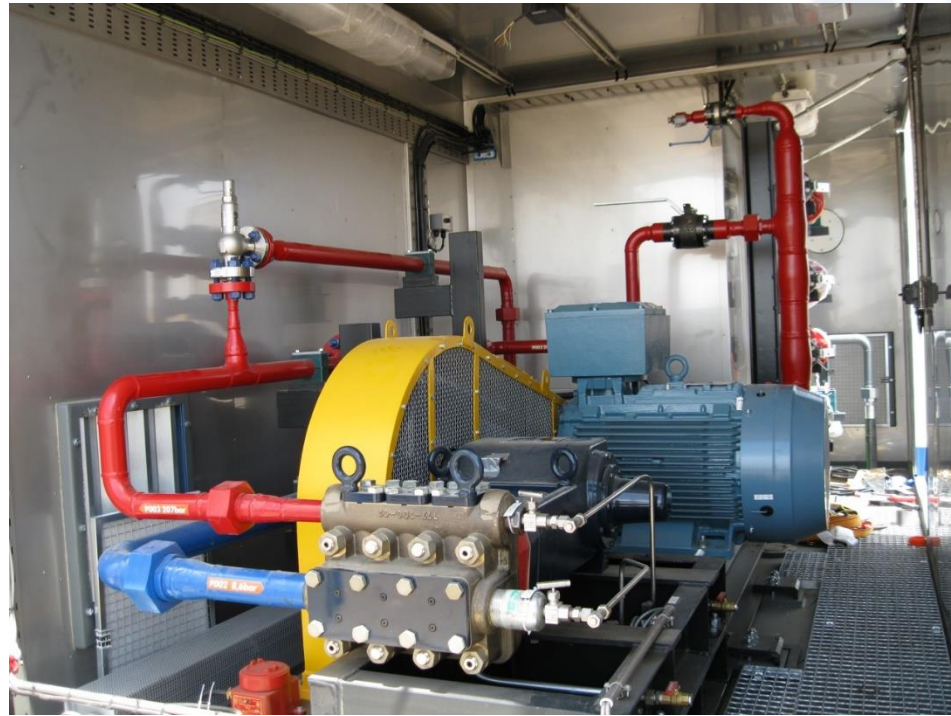


TFC Artificial Lift Solutions

Increasing reliability and efficiency while
decreasing downtime, OPEX and required
long term maintenance

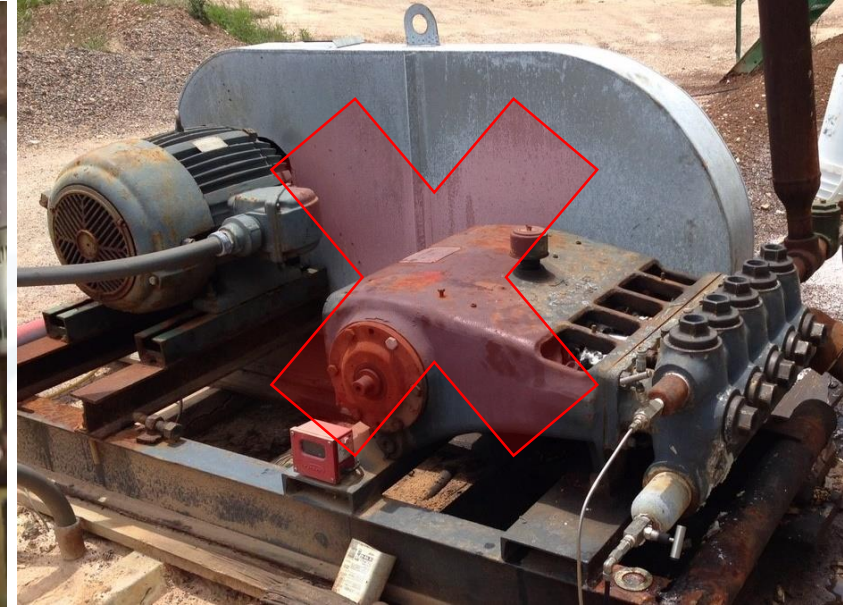
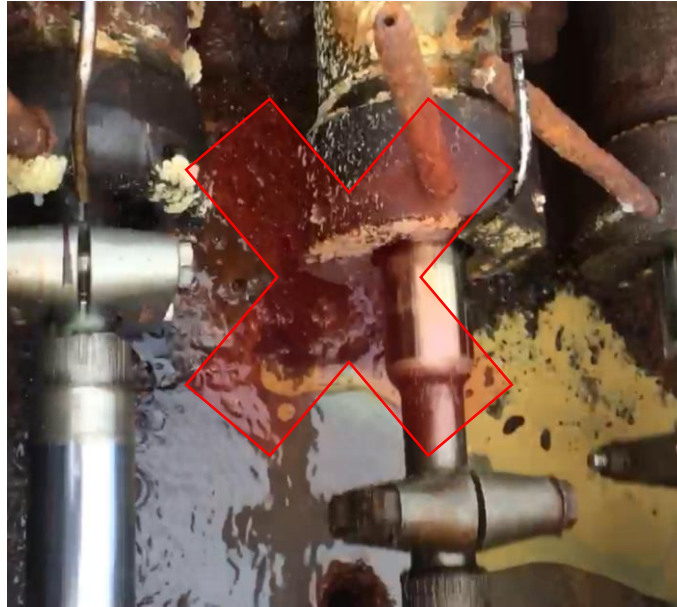
Increased Reliability

- Typically multiplex pumps are used as power fluid injectors with jet pump systems. TFC utilizes Hpumps (horizontal multistage) and Hydra-Cell Pumps (positive displacement diaphragm) to significantly lower the overall maintenance cost of the system to the end user or operator. Both being completely sealed pumps, this lessens the environmental impact to the operator at the well site.



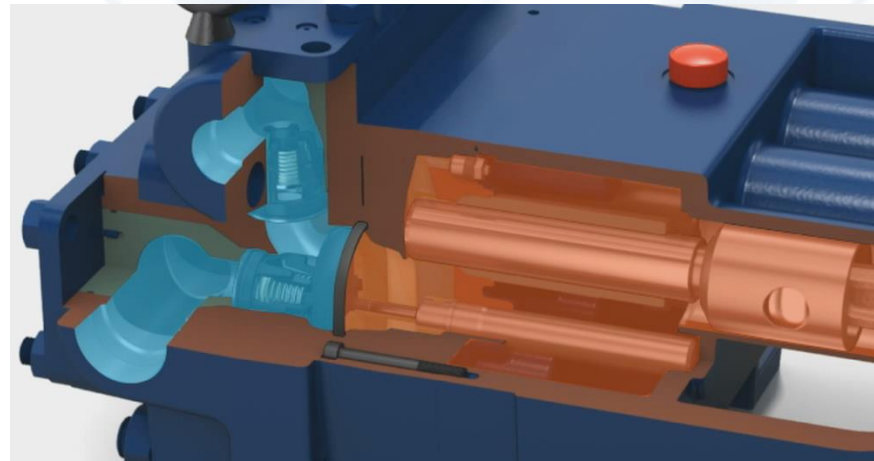
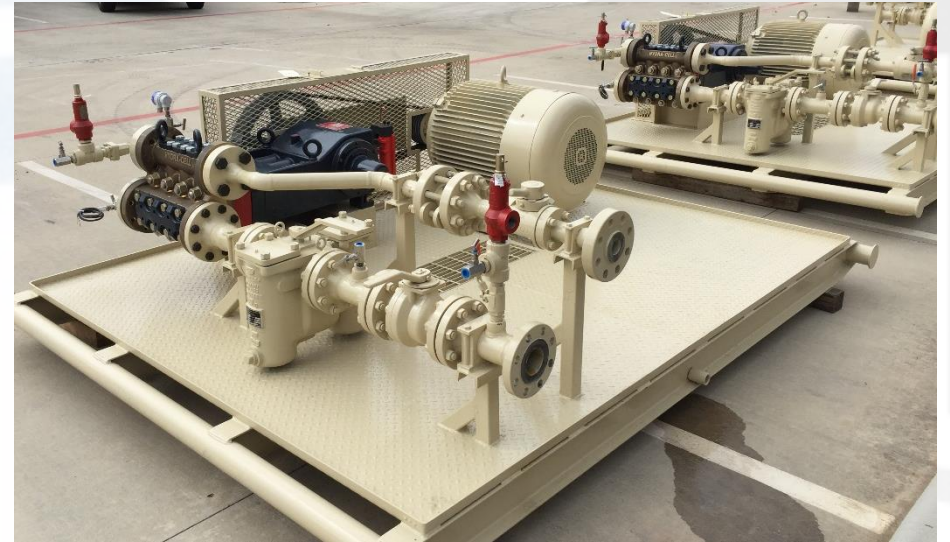
Benefits of HPump over Positive Displacement Pump

- Decreased maintenance & OPEX
- HSE friendly completely sealed pump
- No plungers, packing, & external lubrication
- Increased reliability
- Low vibration extends life of system components
- Flexible design from 800-130,000bpd
- Broad temperature operating range



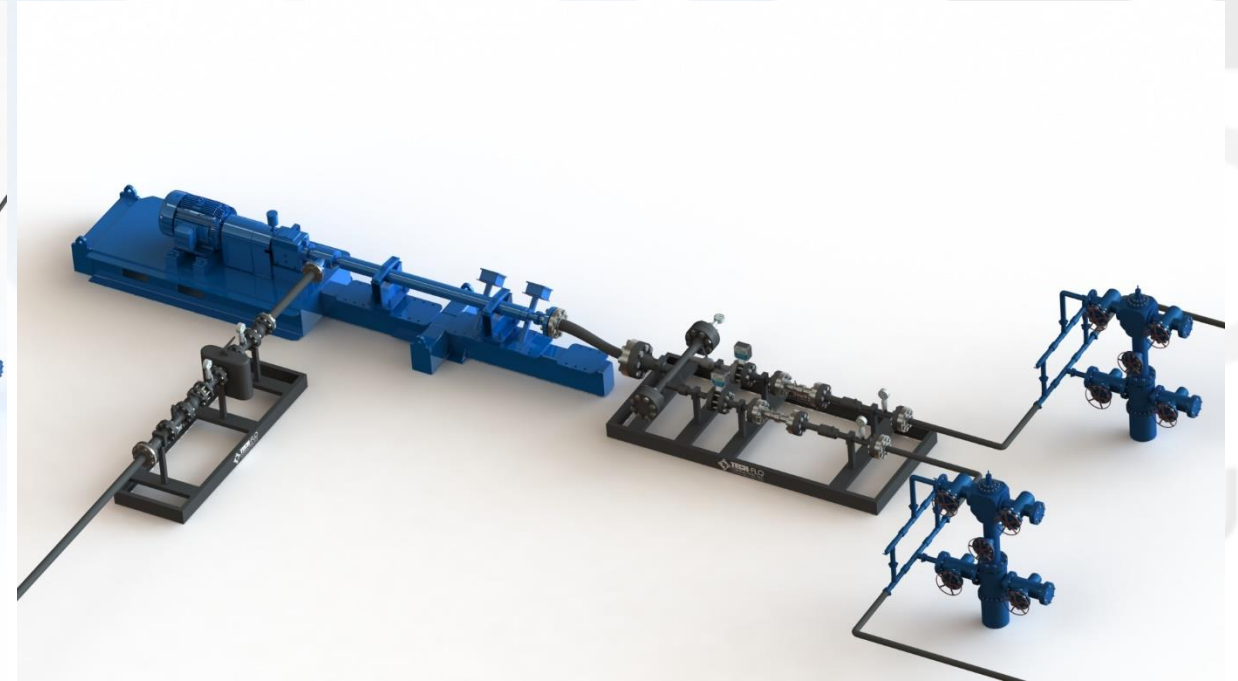
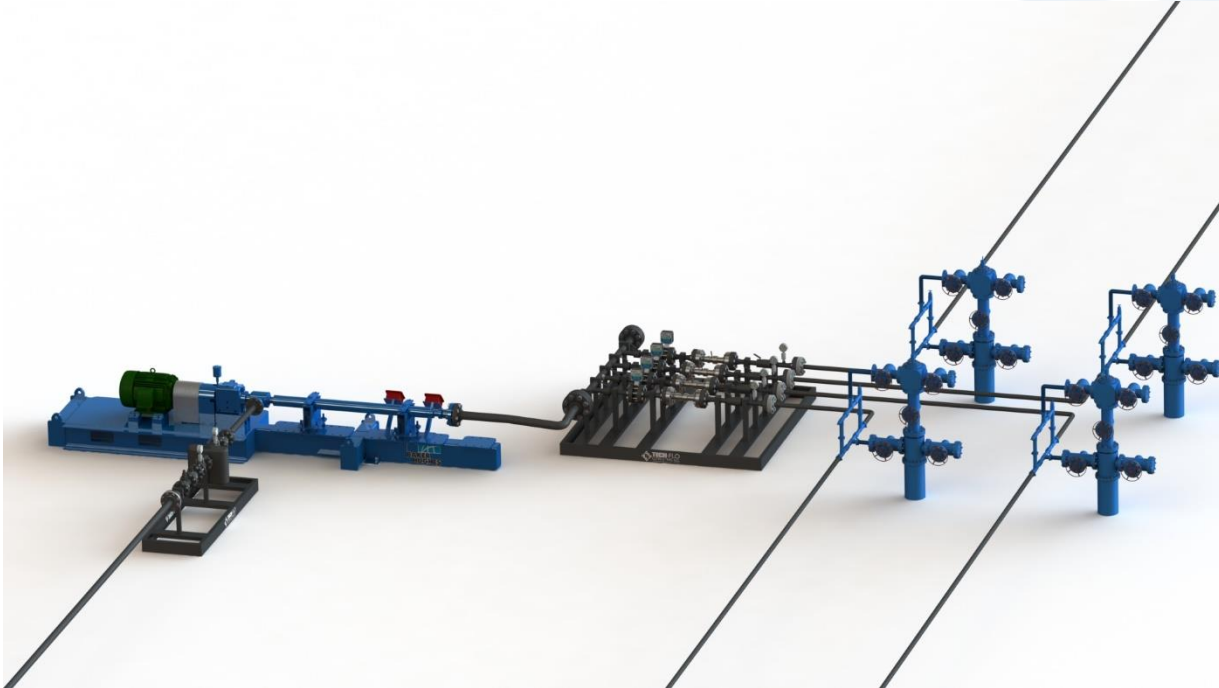
Benefits of Hydra-Cell over Positive Displacement Pump

- Decreased maintenance & OPEX
- HSE friendly completely sealed pump
 - Keeps pumped media 100% contained
- No plungers, packing, & external lubrication
- Very low operational maintenance
- Pump can self prime and operate in low NPSH or vacuum conditions
- Low vibration extends life of system components
- Pump can run dry indefinitely without damaging the components.
- Same volumetric efficiency as a multiplex pump



Multi Well Production

- With the TFC jet pump line and surface pumping capabilities we are able to produce several wells from a single power fluid source, lowering the per well capital cost for the operator.



Multi Well Production Benefits

- Split the capital equipment investment over 2,3, 4 or 5 wells
- Can be applied to pad sites or even when wells are far apart in fields
- Central facilities
 - Minimizes operators work load and logistics
- Reduction in maintenance cost
 - One surface pump to maintain rather than multiple pumps
- Simple operation and functionality
 - Can set, reverse and service other downhole jet pumps while other wells are in operation





Refrac Roadmap™

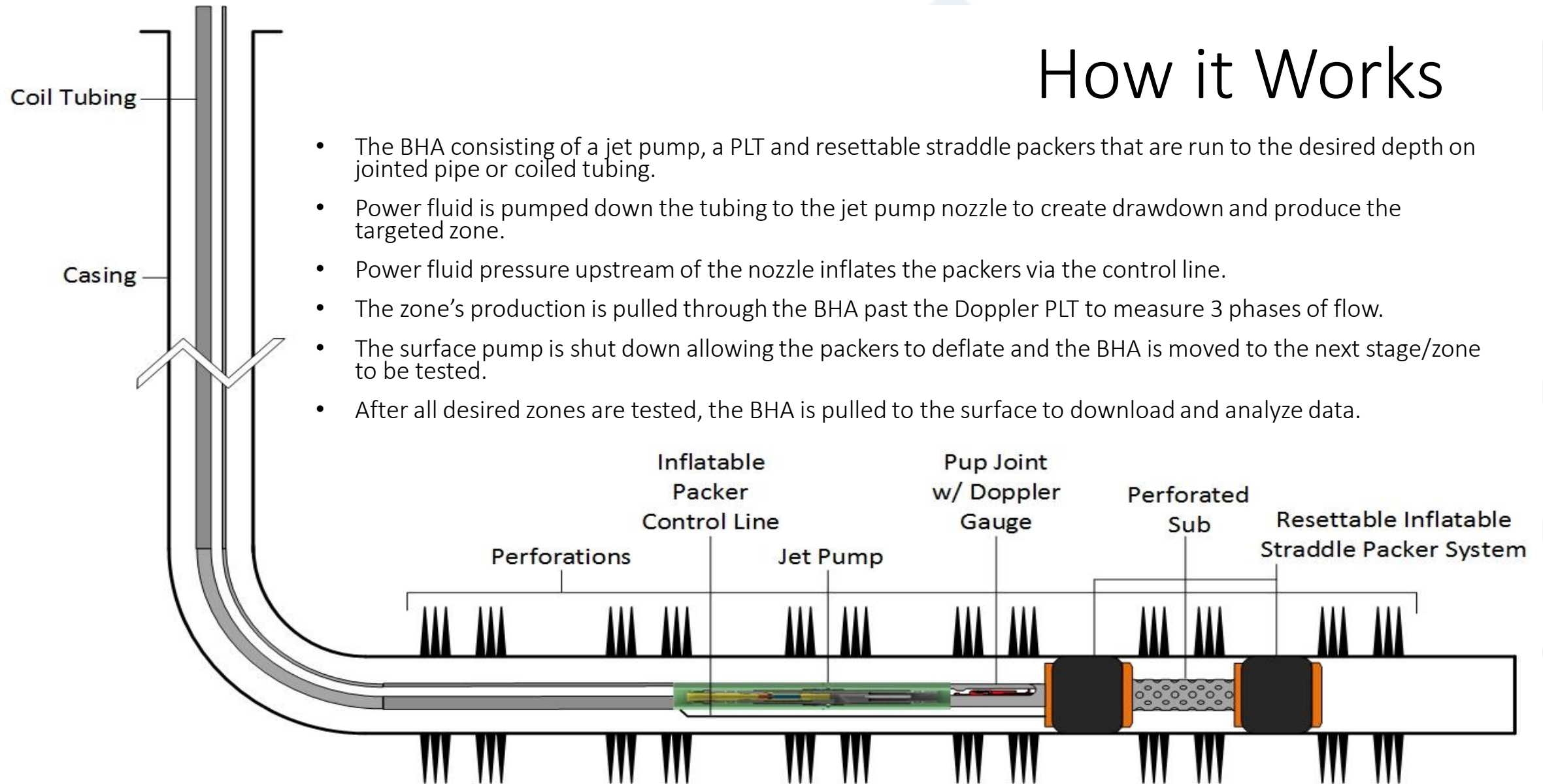
Focused Production Measurement

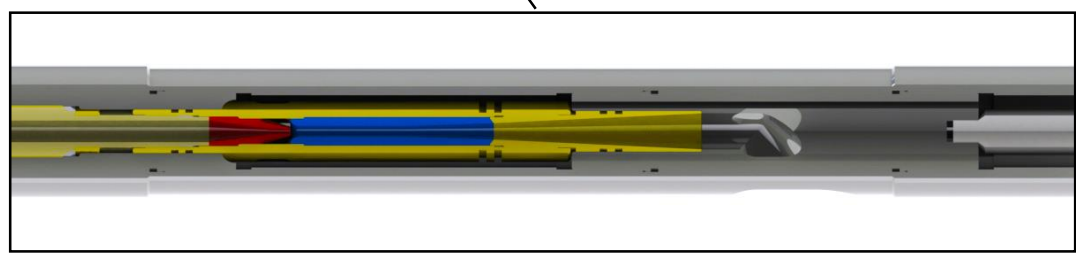
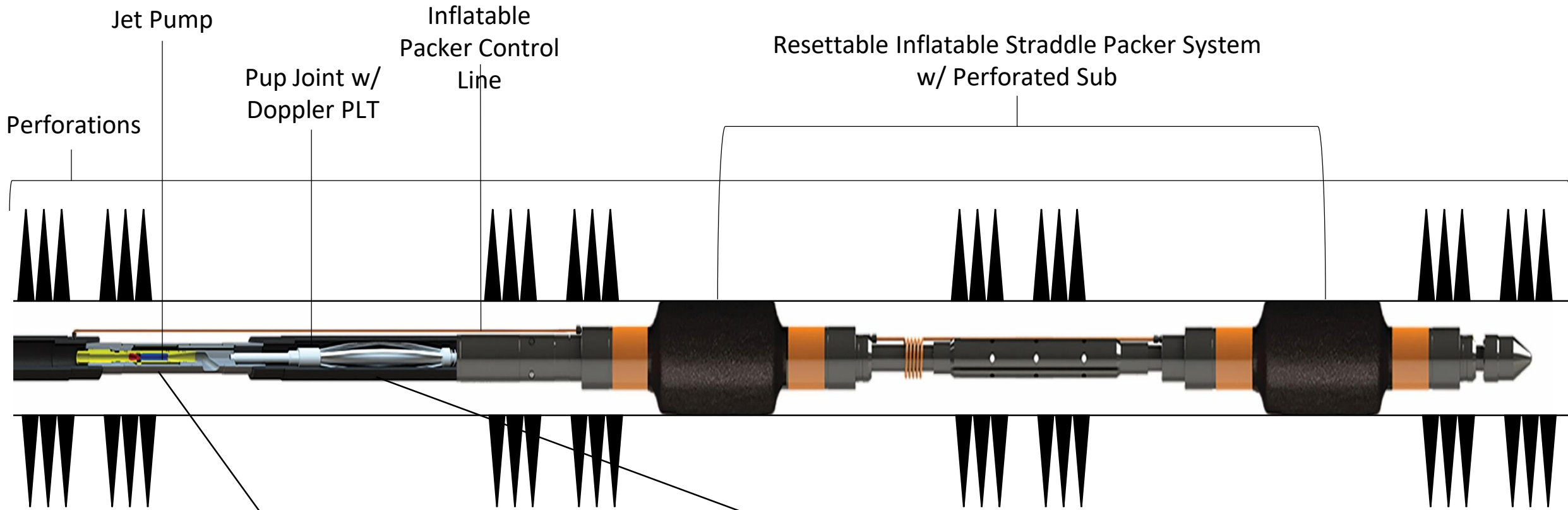
Patent Pending, US and INTL

FPMS – What does it do?

- Multi Stage Production Measurement System
 - Utilizes the flexibility of a hydraulic jet pump to produce the well while each zone is isolated between straddle packers.
 - Increases and measures a flowing well's production.
 - Produces and measures a dead well's production.
 - Can produce a stage's absolute open hole potential ($P_{wf} = \pm 0$).
 - Measures 3 phase flow from isolated zones in a multistage vertical or horizontal well.
 - Measures static and flowing bottom hole pressure from isolated zones to determine inflow performance.
 - Measures temperature in isolated zones in a multistage well.
 - Can be run in memory mode or real time mode.
 - Can be utilized both inland and offshore
 - Max Temp 275° F

How it Works





Jet Pump



Pup Joint w/ Doppler PLT

Applying the Information Collected

- Water control and zone isolation
 - Shut off water producing zones via scab liner or squeeze to limit water handling cost and increase hydrocarbon production.
- Re-Frac/stimulation potential
 - Via the FPMS we can examine the most productive zones or find the least productive pre re-frac to limit cost and pin point the zones that require stimulation or fracturing.
- Exploration value
 - Testing vertical wells to examine the area/zone to drill future horizontals.
- Well testing/artificial lift selection
 - Test a wells absolute potential for artificial lift selection
 - Evaluate wells value via 3 phase well testing
 - Measures salinity to confirm water flood water has reached the targeted zone.
 - Measures static and flowing bottom hole pressure from isolated zones to determine inflow performance.

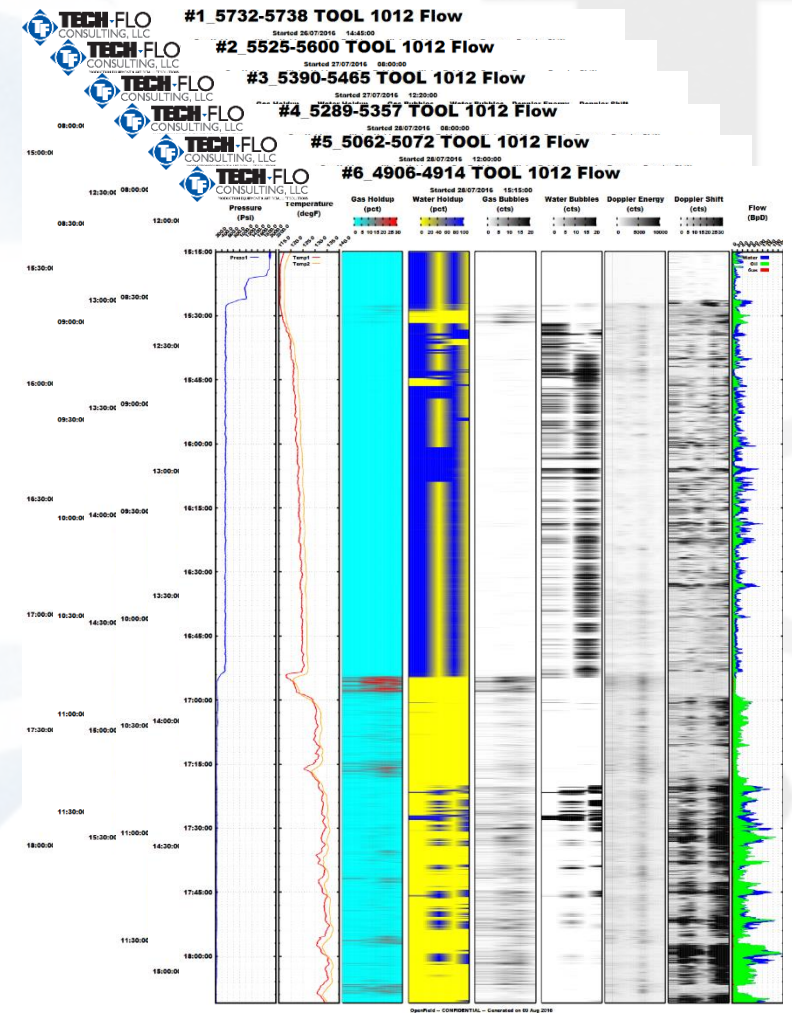
Real Results – Case Study 1

Permian Basin Vertical Well – July 2016

Application: An oil and gas well operator wanted to test 6 vertical zones for 3 phase production and producing formation pressures. The Refrac Roadmap™ or Focused Production Measurement system was selected and for the test.

Results: After testing the 6 zones for 3 hours a piece, the system was removed from the well bore and the data was downloaded from the PLT and analyzed. The results indicated that that two of the zones were producing 100% water and a third zone was producing majority water and minimal hydrocarbons that were not marketable. The jet pump was able to draw the formation pressure down to and below 100 psi at pump intake resulting in absolute zone production potential. (See data on next slides)

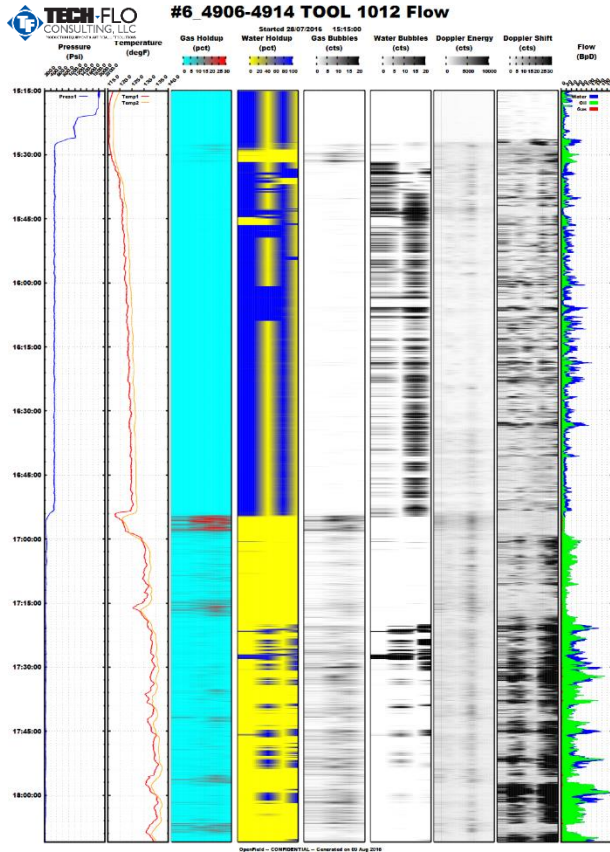
Remedial work over and application of lift: Based upon the data collected from the test, Tech-Flo was able to set a bridge plug above the 3 non hydrocarbon producing zones and isolate the majority of the water production from the well. The operator then chose a jet pump from Tech-Flo to produce the 3 productive zones for permanent production. Water production decreased from the well by 140 bpd while oil production stayed constant at 65bpd with minimal water. By controlling the water production from the well the operator saved 25,000.00 USD per month in disposal and water hauling expenses.



Real Results – Case Study 1

DATA - Hydrocarbon Producing Zone

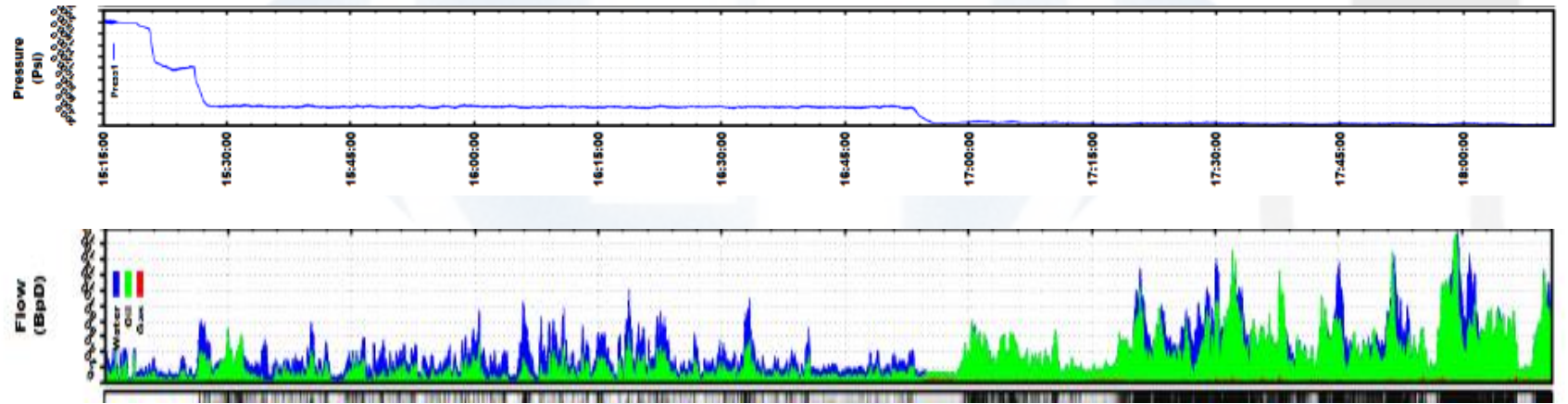
Permian Basin Vertical Well – July 2016



Initial Static PSI drawdown and flush production

Maximum draw down via TFC Jet Pump

Bottom hole pressure graph



Formation fluid graph, Green = Oil, Blue = Water

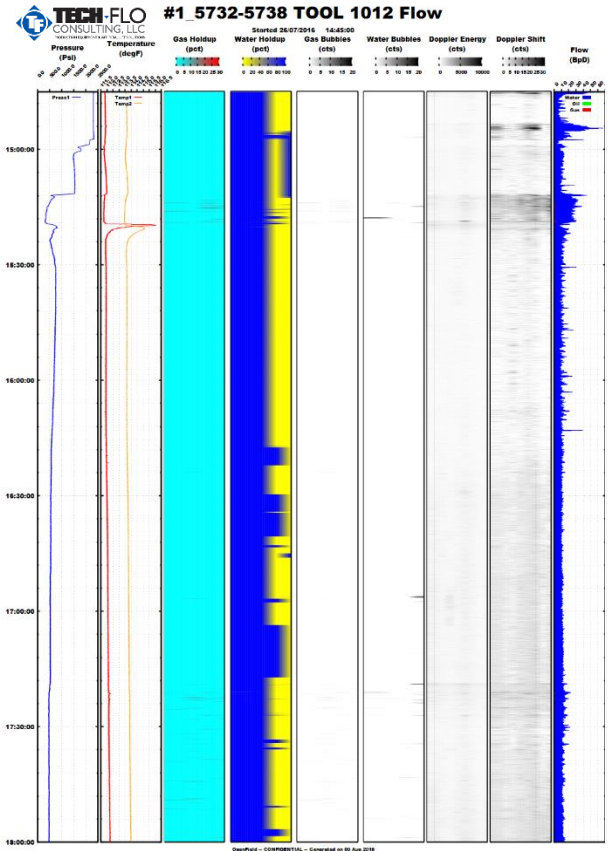
Flush wellbore production

Absolute zone production potential

Real Results – Case Study 1

DATA - Water Producing Zone

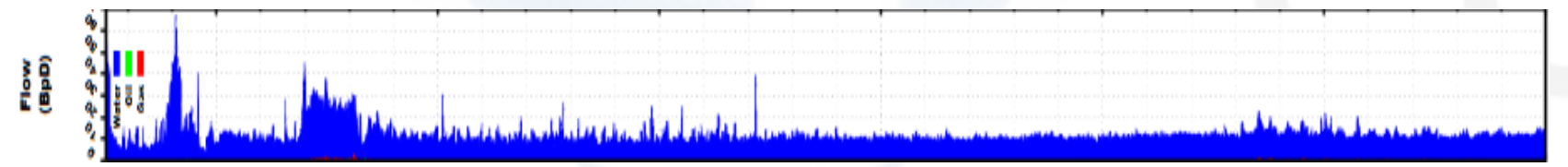
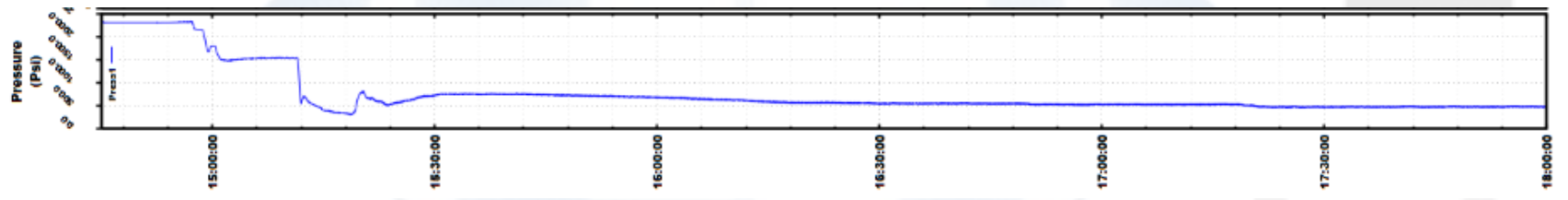
Permian Basin Vertical Well – July 2016



Initial Static PSI drawdown and flush production

Maximum draw down via TFC Jet Pump

Bottom hole pressure graph



Formation fluid graph, Green = Oil, Blue = Water

Note: Zero hydrocarbon production, 100% Water

Flush wellbore production

Absolute zone production potential

In Conclusion

We greatly thank you for your time and attention. Please contact Tech-Flo using the information below for any additional material, case studies or to have a specific well analyzed and system quoted.

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