



WELL SUSPENSION TOOL APPLICATIONS

“THE PRODUCTION TOOL YOU DIDN'T KNOW YOU NEEDED!”

The Well Suspension Tool line enables an operator to suspend their sucker rod assembly within their well. This new technology enables well maintenance operations, well servicing work, and well suspension, to be performed safely and economically.



The WST tools were invented through the necessity to think outside the box in determining new economic well operating solutions.

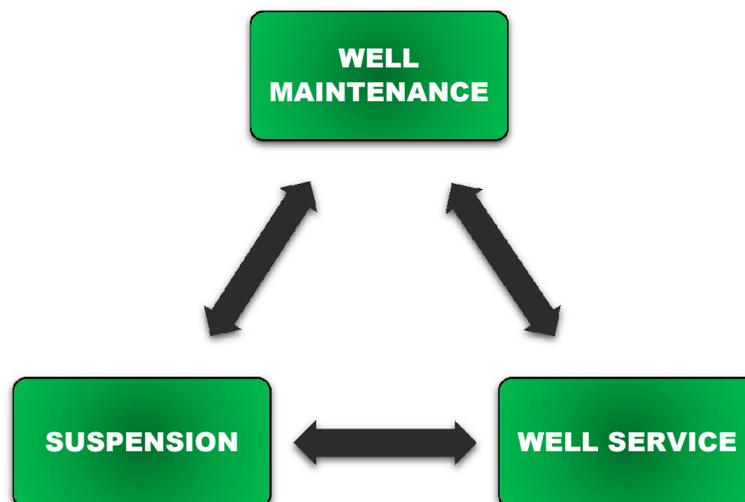
The tools are manufactured in Canada to the highest quality standards following ISO9001 and API standards.

The WST tools are designed to withstand high stress, high pressure, high temperature, plus H₂S (sour) and CO₂ environments.



The tools have multiple applications that will assist you to maintain or increase your production, while reducing expenses, and protecting both your assets and the environment.

Outlined below are applications which were recognized prior to, and during the development of the Well Suspension Tool line. In addition, clients are continually discovering new applications!





WELL MAINTENANCE

“Operation Maintenance, Reservoir Maintenance, Well Mechanical Maintenance”

During the production phase of your well, many different problems will arise which require on-going maintenance.

- Circulate your well past your bottom hole pump, and utilize your tubing for treatments, which allows for better control of your operation and expenses.
- Paraffin wax buildups, sand, scale and related mechanical problems which require chemical treatments, can be done more effectively down the tubing than down the annulus.
- Reservoir stimulation chemical treatments and stage solvent, can now be done safely down the tubing using smaller volumes and higher treatment pressures.
- During wellbore flushing, operations are currently constrained due to a low pressure wellhead assembly. By suspending the rod string safely, and installing a high pressure wellhead assembly, higher circulation rates and pressures can be utilized.
- SAGD steam injection can now be done safely, and with reduced operational issues by not having to remove the entire rod assembly for steam injection or service.
- Intermittent production wells which only produce part time due weather, geographical area, or reservoir maintenance, can be properly suspended which will allow the well pressure an opportunity to build and reduce liability of remote locations.
- Reservoir strategies can be developed which will allow you to determine a reservoir production program of shutting in strategic wells for injection or depletion.
- Utilize your tubing for pressure buildup operations.

- In heavy oil operations, you can now install bottom hole pressure recorders on your rod string without the problem of a wellhead leak.
- Allows for “scheduled” cost effective treatments of your reservoir, to maintain and increase production.

PROCEDURE

1. Unseat bottom hole pump and kill well down tubing.
2. Remove wellhead assembly at predetermined point.
3. Install the WST rod suspension tool.
4. Install a high pressure wellhead assembly.
5. Read and record shut in tubing and casing pressures.
6. Perform procedure by circulating down the tubing while monitoring the backside annulus pressure to determine how the well is responding, during the operation.
7. Flush well as required.
8. Remove WST tool and high pressure wellhead assembly.
9. Re-install polished rod/stuffing box and re-seat bottom hole pump.
10. Resume production.

These procedures will enable you to perform your maintenance operations in the most effective and cost efficient methods.



WELL SERVICING

“Operations Level Loading, Safer Operations, Well Mechanical Maintenance”

With the WST tool line, well servicing operations can now be done more efficiently and safely.

- At any point during the installation or removal of the sucker rod assembly, the operation can stop and the well can be secured. Rods no longer need to be all in or completely out.
- In an emergency, the well can now be secured quickly and efficiently.
- If the weather changes or operational issues arise that will result in a longer installation time, the well can be secured and operations can resume at a future time.
- Operations can be “Level Loaded” to ensure the maximum efficient use of services. You can start/stop operation at any time while optimizing the use of equipment & personnel. Overtime and “hours of work” are more easily controlled by well site supervisor. An operation can be suspended safely, completed in the morning, the rig moved, and the next operation started.
- Stuck rod strings can be flushed using a high pressure system, rather than picking up and installing the polished rod, and depending on the stuffing box for a pressure seal.
- The protection of offset wells during fracking operations is safely done by suspending the rod string using the WST ‘T’ tools, and installing a high pressure wellhead and pressure monitoring system. This leaves the well securely suspended.

PROCEDURE

1. Kill well down tubing.
2. Install MS landing sub on top of flow tee.
3. Install sucker rod table system.
4. Perform normal operations ‘T’ tool install.
5. Ensure that the well is dead.
6. Strip off and remove rod table.
7. Install WST ‘T’ tool.
8. Install TIW valve.
9. Well secured.

Reverse the procedure to re-commence operations.

These procedures will allow you to execute your service operations safely, efficiently, and in a cost effective manner.

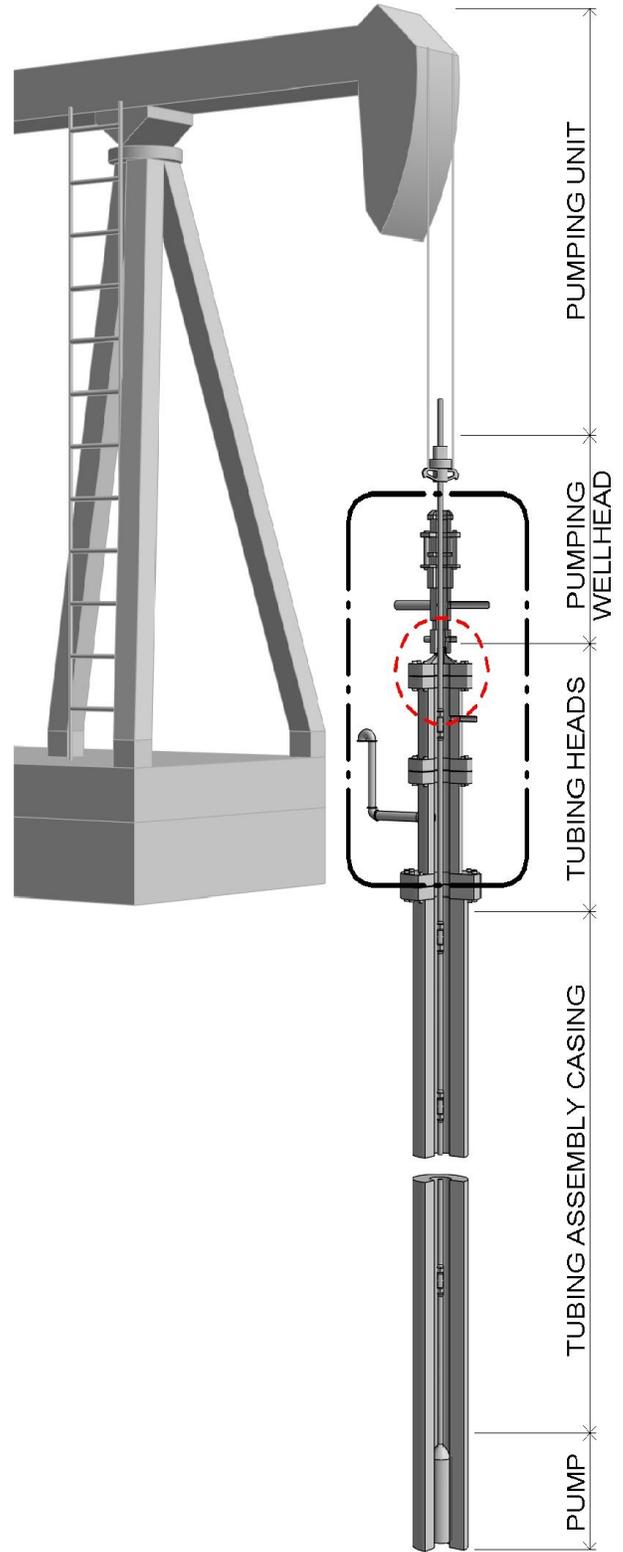


“T” tool installation



Valve installed, well secured.

Beam Pumping Unit



SUSPENSION

“Reduced Liability, Protect Your Assets, Reduce Operating Costs”

Implementing the WST tool line, well suspension operations can now be done more cost effectively, efficiently, and more safely. These tools allow for a well to be suspended and re-activated at any time – hours, days, or years later. Reservoir pressure can be re-charged allowing for greater reserve recovery!

Shut-in wells can have leaking gas, oil, water and H₂S. Suspending the well with the rods and pump protected within the well, along with a proper wellhead, can prevent environmental issues.



A stuffing box and rod BOP combination are not a proper wellhead system for well suspension.

A proper suspension includes a secured wellhead system c/w bull plugs on all outlets.

Using the WST tool system this operation can be done cost effectively and safely.



ADVANTAGES

- 1) **Reduced liability**
 - A full wellhead installed c/w bull plugs.
 - No H₂S or leaking fluids.
 - Regulatory compliance.
- 2) **Leave your well bore properly inhibited**
 - The tool line allows for inhibitors and H₂S scavengers to be pumped past the tool.
 - Properly protect your wellbore casing / tubing.
 - Protect your rod assets by leaving them suspended in the well, not on the ground or moved to a warehouse.
- 3) **Reduce operating costs**
 - Reduced operational requirements.
 - Reduced road maintenance.
 - Shut off power, release energy from pumping unit.
- 4) **Re-activation of well is simple & cost effective**
 - Wells can be suspended and re-activated based on their economics.
 - Wells can be suspended until services are available.
 - Simple, easy installation.

PROCEDURE

SUSPEND

1. Unseat bottom hole pump and kill well.
2. Remove wellhead assembly at predetermined point.
3. Install the WST rod suspension tool best suited for the operation.
4. Install a wellhead assembly.
5. Pump inhibitor down tubing and casing.
6. Install bull plugs, and chain and lock wellhead.

RE-ACTIVATE

1. Kill well as required.
2. Remove wellhead assembly.
3. Remove WST rod suspension tool.
4. Re-install polished rod / stuffing box.
5. Re-seat bottom hole pump.
6. Resume production.

These procedures will allow you to suspend and re-activate your well, while reducing your costs, and your liability.

Send inquiries to:

sales@wellsuspension.com

or call toll free 1 (844) 483-1124

Technical information and installation videos are available at
www.wellsuspension.com



THIS IS PREVENTABLE!!!

These spills were caused from improperly suspended wells,
shut in on the stuffing box and rod BOP only.

