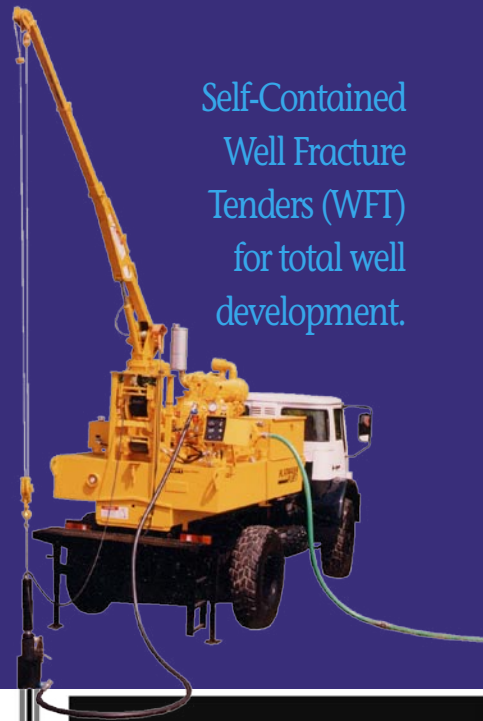




## WFT WELL-FRAC

A system for getting more water from existing dry or low yield wells.

Self-Contained  
Well Fracture  
Tenders (WFT)  
for total well  
development.



# Why Choose Flatwater Fleet?

Over the years, Flatwater Fleet has built a world-wide reputation for the innovation, quality and performance of its drill site support equipment. Hundreds of companies, organizations and governments in dozens of countries, are testimony to the durability, reliability and productivity of Flatwater Fleet

RTT-Rig Tenders®. This high standard of design, engineering and manufacturing is now available in the WFT WELL-FRAC™ system of well development and well service equipment.

## Quality

The commitment is to excellence. The quality is in the details. From stainless steel water pump shafts to pulsation dampeners on high pressure pump/engine mounts. From environmentally safe internal tank coatings to long lasting polyurethane finishes. From 3:1 safety margins on pins, bushings and couplings to engine safety shutdown and high pressure safety bypass chambers. Flatwater Fleet gets the details right.

## Value

Value is a creation of time. The longer equipment and tools perform reliably with a minimum of repair costs and breakdowns, the greater the value. At Flatwater Fleet, value is built in -- not added on. This means that the engines used have the horse power and torque to do the job right without overloading; that pumps have the proper bearings, seals and vales for extreme service, and that the hydraulic components exceed the working pressure required. Through and through, the WFT WELL-FRAC™ system is "built to last."

## Proven Performance

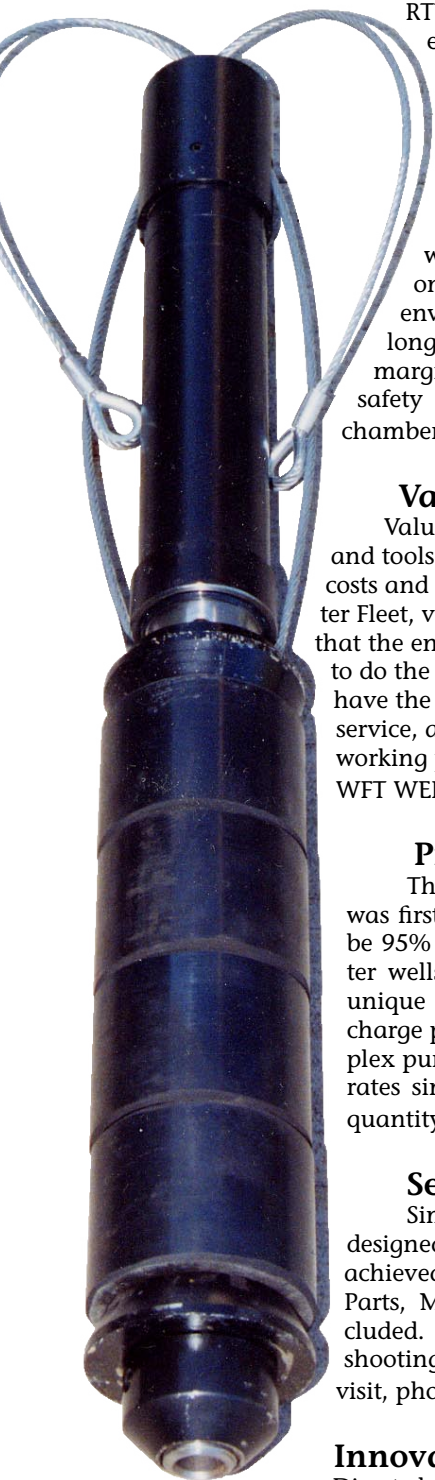
The hydro fracturing method of well development was first developed in the oil fields and has proven to be 95% successful at increasing the production of water wells drilled in rock formations. Flatwater Fleet's unique combination of a hydraulic-powered supercharge pump feeding a direct engine high pressure triplex pump produces both high pressure and high flow rates simultaneously. Both pumping time and water quantity are reduced.

## Service

Simplicity of operation and maintenance are designed into the system. Excellent results can be achieved with minimal knowledge and experience. Parts, Maintenance and Operator's Manuals are included. Sequence, methods, techniques and troubleshooting are explained. Technical advice available by visit, phone, fax or E-mail.

## Innovation Design

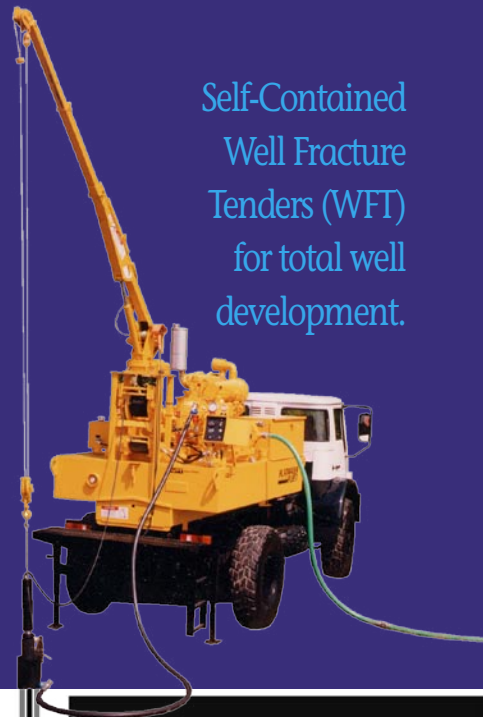
Direct drive frac pump eliminates transmissions, belts and sheaves. Full flow at both low and high pressures eliminates unloader adjustments and pump cylinder overloads. Hydraulic 10,000 psi (700 bar). FRAC-PACKER™ with solid rubber "donuts" eliminates costly and fail-prone bladders and mechanical hook jaws. Lightweight, hand-tightened FRAC-PIPE™ eliminates cumbersome and heavy tubing and wrenches.



# Get More Water from Existing Wells Without Drilling New Wells

It is now possible to greatly improve poor producing water wells that already exist without the time, risk and high cost of drilling new wells. A water well drilled into a rock formation may be dry or low producing because of few or no connections to surrounding water-bearing fractures. Similarly, a water well that has been drilled into a sand and gravel formation may produce very little water because of well screen or filter zone plugging, bio-fouling or encrustation. The WFT WELL-FRAC™ system of proven aquifer and well development equipment, tools and methods can quickly and economically correct these problems -- without drilling new wells.

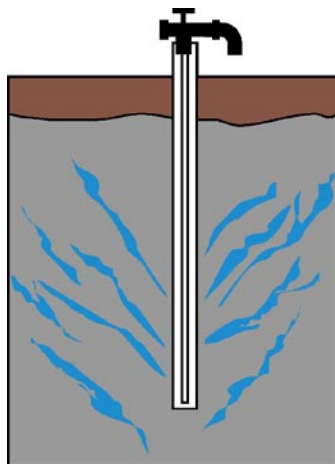
Self-Contained  
Well Fracture  
Tenders (WFT)  
for total well  
development.



## Turning poor wells into good wells fast and efficiently.

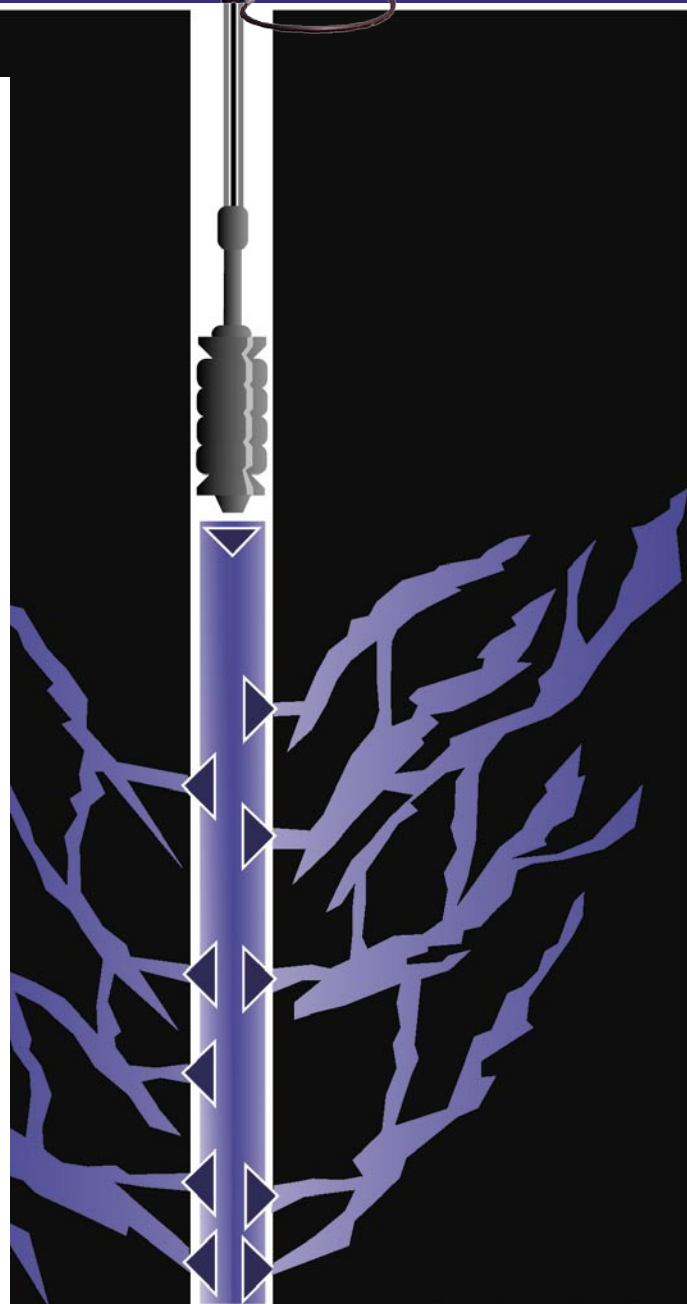
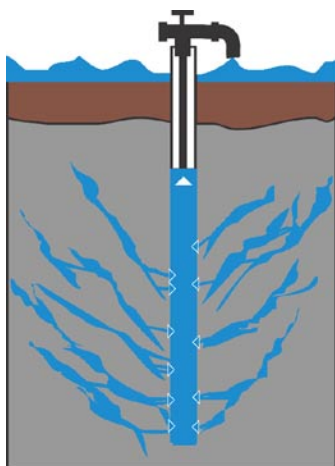
### Before Well Fracturing

A large investment in equipment, material, time and manpower has been used to drill a bore hole into a water bearing rock formation. However, very little water is getting into the bore hole. The natural fractures are plugged with sediments, rock flour, bio-fouling or mineral deposits. People, livestock or crops are not getting the water they need. A valuable asset is being wasted.



### After Well Fracturing

A WFT WELL-FRAC™ system has been used to set a string of FRAC-PIPE™ and FRAC-PACKER™ plug into the bore hole. A frac-pump then has injected a large flow rate of clean water into the bore hole below the packer at high pressures. In just a few minutes, fractures have been opened up and flushed out allowing the groundwater to flow to the well. The people's needs have been satisfied. A Valuable asset has been saved.





## A Model for Every Need

The integrated design of the WFT WELL-FRAC™ system starts with the basic core model and then can be expanded to match the customer's needs and means of transport. The basic model includes: diesel engine, clutch, frac-pump, charge-pump, high-pressure relief valve w/chamber, controls and 3-way-frac-water valve. Several engine/frac-pump combinations are available within the basic core model to deliver frac water at pressures up to 4200 psi (300 bar) and flow rates to 150 gpm (560 l/min). Engines provide 100 hp (75 kw) to 175 hp (130 kw). Geologic formations and budgets are the primary determining factors in selecting a frac-pump/engine combination.

Further expansion of system capability can include: a hydraulic-planetary winch for lowering and raising the FRAC-PACKER™ and FRAC-PIPE™ in the bore hole, a deck or flat water tank with 800 to 2600 gallons (3 m<sup>3</sup> to 10 m<sup>3</sup>) and universal mounting kit for truck or trailer; storage compartments for tools and accessories; reel for packer hydraulic hose; pump service hoists; generators and compressors.

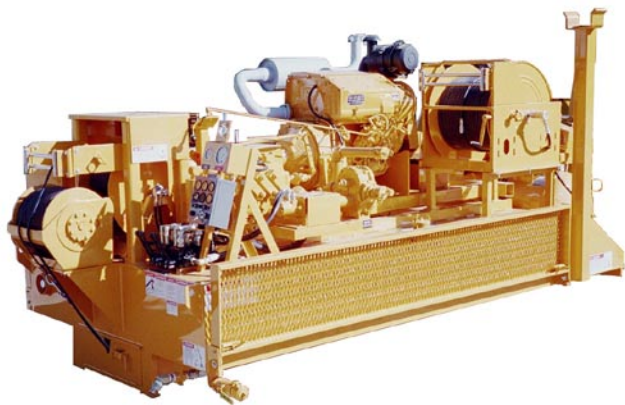
### Well-Frac Truck

This model is totally self-contained with pump service crane, frac-water tank and truck for dedicated use as a complete well development and pump service unit.



### Well-Frac Trailer

This model provides complete well development capability when towed by an existing or locally provided water truck. Fits in ocean ship container.



### Well-Frac Skid with Tank

This model is also a totally self-contained well development and pump service unit for local installation on an existing truck or trailer. Fits in ocean ship container.

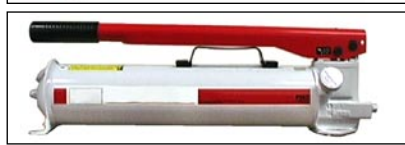
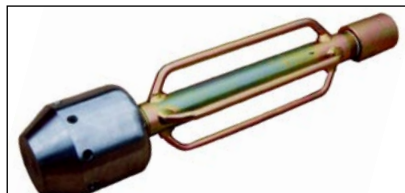
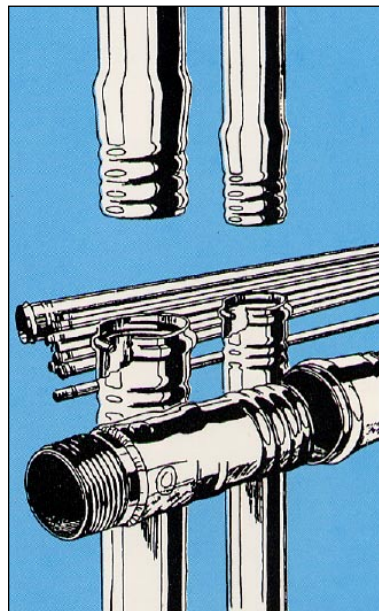


### Well-Frac Skid Without Tank

This model provides complete well development and pump service capability when installed on a locally provided or existing water truck. Fits in ocean ship container.

# Well Development Tools and Accessories

A variety of tools and accessories, some essential and some optional, are used with the system. They are designed for easy use, solid performance and long life. Tools for development of both rock wells and sand and gravel wells are provided. Well inspection, test pumping and clean-out requirements can be satisfied. All of the tools and accessories can be stored on the equipment and secured without need for other vehicles or trailers.



1. The FRAC-PACKER™ is both simple and durable. A Hydraulic cylinder, activated from the surface, compresses solid rubber "donuts" to plug the bore hole and allow clean water to be pumped through the center. Hydraulic pressures up to 10,000 psi (700 bar.) ensure a solid hold. Packer release is both quick and certain. No bags to stick or tear. No jaws to wear out or slip. Small, lightweight and trouble-free. 4" to 20" (100mm to 508mm) bore holes.

2. Air hose reel connects air compressor to air-lift pump for clean out and well screen development.

3. A simple but durable wellhead roller assembly to guide the FRAC-PACKER™ winch cable and hydraulic hose into the bore hole without damage. Fits 4" to 20" (100mm to 508mm) casing pipe.

4. The well head valve cross connects the high pressure frac-water hose to the FRAC-PIPE™. A well pressure bleed-off valve and safety hoisting nipple complete its function.

5. Thin-wall stainless steel FRAC-PIPE™ measuring 1½" in lengths of 5, 10 and 20ft (38mm x .91, 3, 6 m) and weighing less than one-half pound per foot (0.60 kg/m) replaces heavy, long, cumbersome pipe of old. A patented, hand-tightened joint provides fast and easy installation or removal without the need of a pump hoisting derrick. Handles pressure in excess of 4,000 psi (280 bar.).

6. A simple but effective air-lift pump for well clean-out and approximate test pumping. Capable of 26 gpm (100 l.min) to 325 ft. (100 m) of lift. Requires only a small air compressor even with low submergence.

7. 12vdc (24vdc optional) electric FRAC-PACKER™ expansion pump where packer setting depths exceed 130 ft. (40 m). Capable of 10,000 psi (700 bar.). Uses environmentally safe hydraulic oil.

8. Water well inspection cameras and test pump monitoring equipment for professionally demanding requirements. A permanent record of your well.

9. High-pressure water jetting device for cleaning and developing well screens in sand and gravel wells Also blasts rock flour, bio-fouling and mineral deposits from water wells drilled in rock formations. Eight jet nozzles. Velocities to 550 ft./sec. (165 m/sec.) Available for all well diameters.

10. Hand-operated FRAC-PACKER™ expansion pump for packer setting depths up to 130 ft. (40 m). Capable of 10,000 psi (700 bar.). Uses environmentally safe hydraulic oil.



## Equipment Features and Options

All WFT WELL-FRAC™ systems feature air-cooled, turbo-charged diesel engines with high-torque rise characteristics. These engines provide instant load pick-up, low fuel consumption, minimal maintenance, easy starting, no cooling system leaks/freeze-ups/overheating and long life. All frac-pumps are positive displacement, tri-plex piston or plunger style with built-in gear reductions, water filters, adjustable relief valves and by-pass relief chambers for no frac water losses. Self-priming, hydraulic-driven water supercharge pumps also fill water tanks. Their stainless steel shafts and Teflon bushings eliminate lubrication requirement. Well acid compatible versions are also available. Every component function is designed for ease of operation with minimal maintenance. Unique design utilizes an absolute minimum of water hoses, pipes and valves for safety and simplicity.

### Operator Friendly

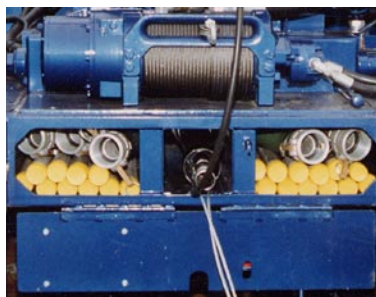
All controls for engine, clutch, charge pump, frac pump, winch and pump service crane are grouped in one location for the operator. Pressure and temperature gauges for engine, frac-pump, FRAC-PACKER™ and hydraulics are centrally located on control panel. A fold-up operator's platform is used on truck-mounted units.

### Pump Service Crane

A 360° rotating, live hydraulic, radio remote controlled pump service crane option provides complete well service capability of existing water wells already in use. Full circle rotation and -10° to +70° boom elevation gives access to tight places and provides general material handling capability.

### Generator

Optional air-cooled, diesel driven S.E.R. type generator provide voltage to within 1% of rating for running test pumps, light plants and power tools. 5, 10 or 15 kw 110/220 vac. single phase or 380/440 vac. three phase. 50 hz or 60 hz. Complete with control panels, submersible pump cable quick-connects and vibration dampeners.



### Hose Reel and Winch

Centrally located reel stores packer expansion hose. Hydraulic driven, planetary winch lowers and raises FRAC-PACKER™, FRAC-PIPE™, jetting nozzle and air-lift pump over wellhead roller assembly into the bore hole without the need of a hoisting derrick.

### Tool Storage

A conveniently located storage compartment holds FRAC-PIPE™, FRAC-PACKER™, frac hose and water hose. A lockable door prevents tampering or theft. These small and lightweight tools and accessories are far easier to use and handle than other heavy and cumbersome methods.

### Compressor

An optional on-board compressor provides all the air and pressure needed to operate air-lift pumping device for well clean-out and fast, approximate test pumping. Engine or hydraulic drive.

For additional information, contact:

[www.flatwaterfleet.com](http://www.flatwaterfleet.com)  
[info@flatwaterfleet.com](mailto:info@flatwaterfleet.com)

**FLATWATER®**  
**FLEET**  
INC.

5354 Twig Blvd. Saginaw (Duluth), MN 55779  
(218) 729-8721 • (218) 729-8721 FAX