

# Non-Contacting Solution for Plugged Off Flow Meters in The Oil Patch



“When something works,  
it works”

*Terry Willoughby  
Petrobakken Energy Ltd.*

For years [Petrobakken Energy Ltd.](#) used inline turbine flow meters to track the flow rate of oil recycled to treaters. But with a high concentration of wax and sand in the oil, the turbine meters were quickly plugging off. The line had to be shut down at least once a day and the turbine flowmeters disassembled for cleaning. This was troublesome and expensive. Petrobakken knew there had to be a better way.



**Tanker Truck Offloading at  
Petrobakken Crude Oil Battery**

Crude oil is delivered by tanker truck to the Petrobakken battery site in Drayton Valley, Alberta and offloaded to emulsion tanks and then pumped to treaters for processing where gravity, heat and chemical additives break down the oil-water emulsions.

To maintain production without shut downs Petrobakken contacted [Seidlitz Engineering](#) of Cochrane, Alberta to help find a solution to their wax off problem. Seidlitz specified clamp-on ultrasonic meters because they work from outside the pipe without obstructing flow. They contacted [Carbon Controls Ltd.](#) in Calgary for DFM 5.0 Doppler Flow Meters manufactured by Greyline Instruments. Three meters were originally installed. Petrobakken's lead operator, Terry Willoughby found that the [Greyline DFM 5.0](#) meters measured flow reliably and were unaffected by wax and sand in the oil. Because they work from the outside of the pipe the Doppler ultrasonic flowmeters did not cause plugging off or pressure drop. With more than six months continuous operation with the new Greyline flowmeters there has been no shut downs for cleaning. Terry commented “When something works, it works”.



**Sand, Wax and Solids  
Removed in Crude Oil Treater**



**Clamp-on Ultrasonic Transducer  
Monitoring Crude Oil Flow in 3" Steel Pipe**

Seidlitz Engineering redesigned the pipe configuration for 1.5m straight runs for good optimum flow conditions. Each flowmeter's 4-20mA output is connected to Petrobakken's PLC for pump speed control. Flow rate and totalizer are displayed on the instrument's backlit LCD display. After three months of successful testing, Petrobakken installed three more Greyline DFM 5.0 flowmeters. All units are mounted on 3" steel pipes. The ultrasonic sensors do not require maintenance or cleaning and do not obstruct flow. Doppler works by injecting high frequency ultrasound through the pipe wall and into the flowing oil. It requires solids or gas bubbles in the fluid to reflect its signal so dirty crude oil is an ideal application for this technology.

The Greyline DFM 5.0 Doppler Flow Meter uses a single-head ultrasonic sensor mounted on the outside of a metal or plastic pipe. The clamp-on sensor works on 1/2" diameter or larger pipes and is rated for Div 2 locations, or it can be Div 1 with optional intrinsic safety barriers. It displays, totalizes and controls with settings entered through a simple keypad menu system.

Time is money in the oil business. Petrobakken's battery site is automated and runs 24 hours a day, 7 days a week. They produce 350 m3 of oil per day and are equipped to handle up to 1000 m3 per day. By switching to non-contacting Greyline DFM 5.0 Doppler Flow Meters Petrobakken can now keep production going without shut downs for flowmeter maintenance.



**Pump Jacks in Alberta**

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