



## **N.E.R.D.™ WIRELESS DYNAMOMETER**

Through the years, the polished rod dynamometer has been the principal tool for evaluating, analyzing and optimizing the operation of sucker rod pumping systems. It is also a helpful tool in the design and selection of the pumping equipment.

Through extensive research and comprehensive field testing, Nelgar Oilfield Services Ltd. has developed the world's first wireless dynamometer - **N.E.R.D.™ Wireless Dynamometer**. It features the following technological advancements over other major competitors'.

- **72 data samples collected per second** (the highest in industry) – provides thorough and accurate polished rod loading relative to its position.
- **Wireless data transmitting** (the world's first) – eliminates cable entanglement for improved safety of operating personnel and equipment.

With each dynamometer test, you will get a **©color coded report** that is concise and offers distinctive visual identification of equipment loading/stress and ensures easy interpretation of the test results in the following areas:


- loading of the surface equipment – polished rod, speed reducer, prime mover and pumping unit structure
- loading of the downhole equipment – rod string
- conditions, performance and efficiencies of downhole pump
- fluid level and field observations

We provide detailed recommendations on how to **increase production, reduce operating expenses** and extend equipment run-life. Pressure survey candidates can also be identified.

**An average payout of 3.5 weeks on our dynamometer test recommendations.**

**Golden Company**  
**100/00-00-000-00 WOM/00**  
**Surface: 00-00-000-00 WOM**

**Foreman's Report/Work Order**

Work Ordered By: William Domore	Type of work: Dynamometer.
Date work completed: xxxx-01-07	Work completed by:  (403)309-2620
Reason for Dynamometer: Production optimization.	Comments: Good pump function. Severe gas interference.

Work requested:

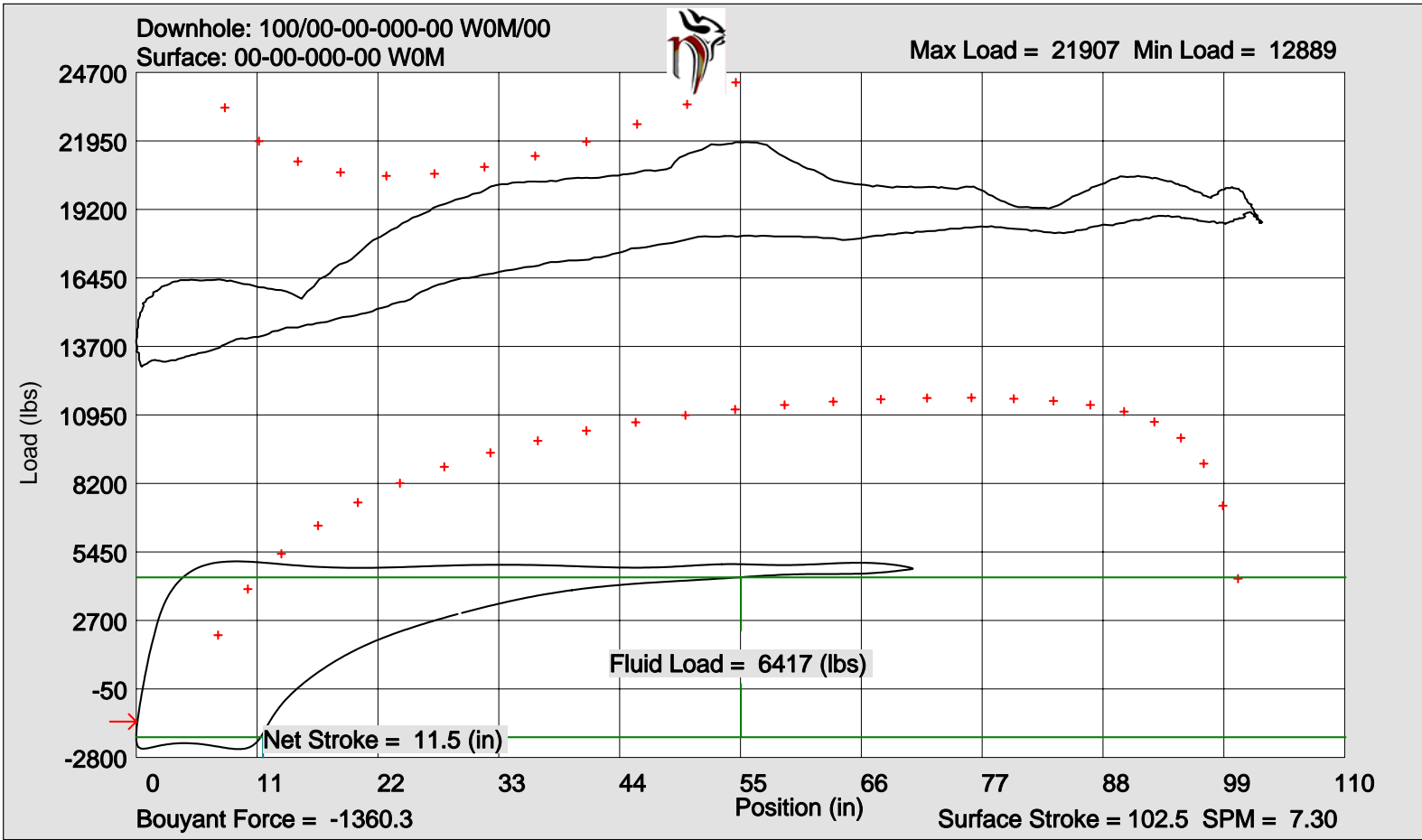
To improve production, increase stroke length from pitman #2 to #1. Monitor production, allow the well to stabilize and re-dyno to evaluate the increased equipment loading and counterbalance requirement.

To reduce the effects of gas interference and increase production, equalize the casing (832 kPa) and tubing (652 kPa) pressure.

Ensure that the well is connected to the 30 hp connection (possible savings of \$1060.00 per month in electricity, prime mover rating: 30-40-50 hp). Horsepower requirements at present time are 15.6 hp.

Work order requested by: _____
Date requested: _____
Work performed by: _____
Date completed: _____
Comments/results

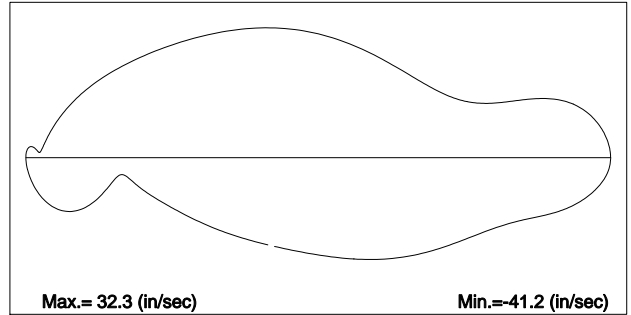




### Rod Loading

Depth (m)	Rod Size (mm)	Loads		% Goodman Range Service Factor of		
		Max (lbs)	Min (lbs)	(1.0)	(0.9)	(0.8)
				0.00	38.1	21807.1
9.81	25.4	21383.6	13001.3	26.9	31.4	37.6
483.47	22.2	16898.9	8327.0	34.5	39.8	47.0
1199.75	19.0	11512.3	3251.0	41.2	46.6	53.7
2274.17	19.0	5075.6	-2463.1	31.9	35.0	38.9

### Pump Velocity



### Current Production

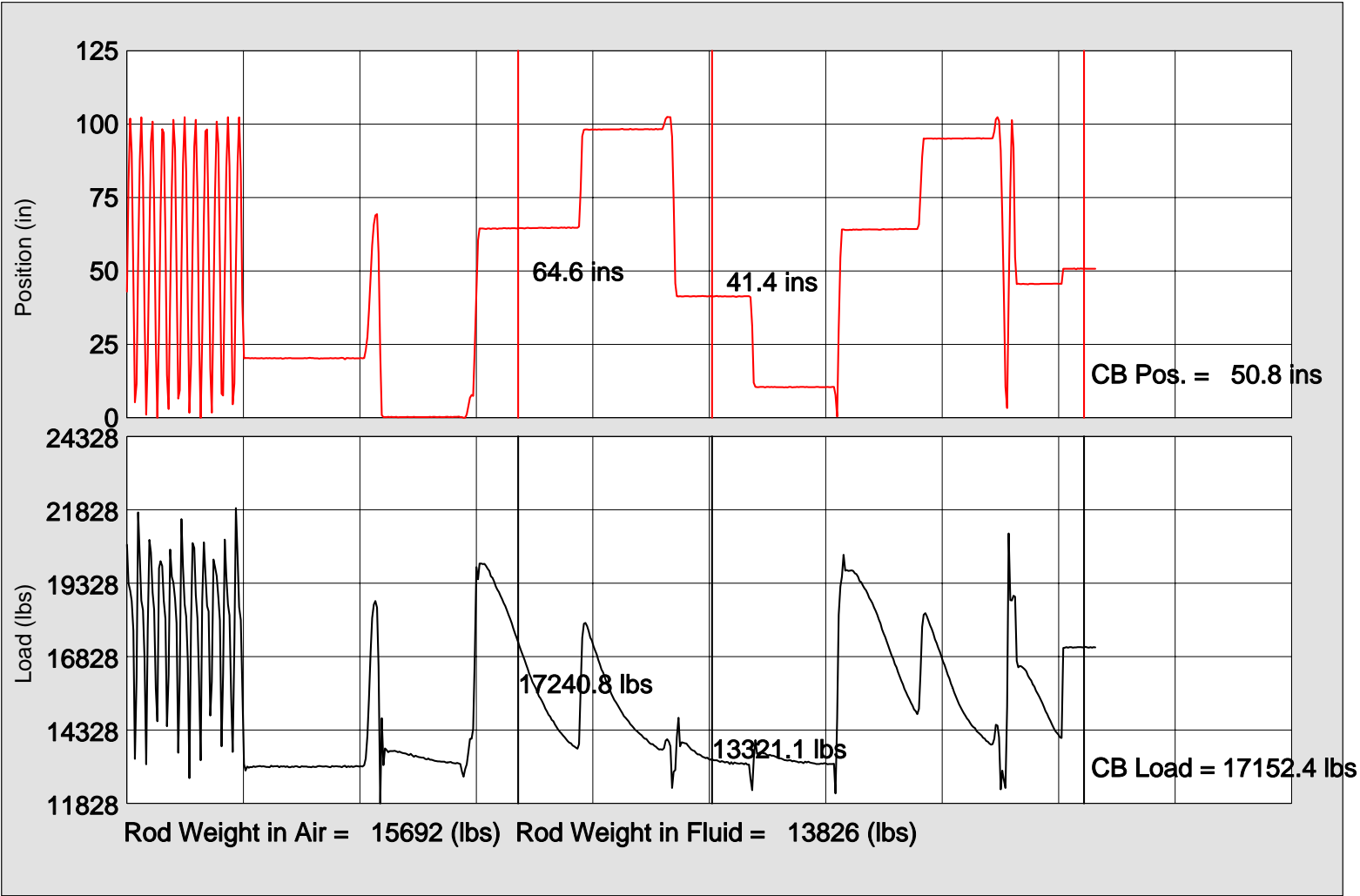
Oil (m3/day):	0.70
Water (m3/day):	3.99
Gas (E3m3/day):	3.75

### Pump Efficiencies

Pump Size (in): 2.00	Gross	Net
Downhole Stroke (in):	70.69	11.54
Displacement (m3/day):	38.25	6.25
Efficiency (%)	12.26	75.09

## Comments

The downhole pumpcard indicates good pump function with severe gas interference.



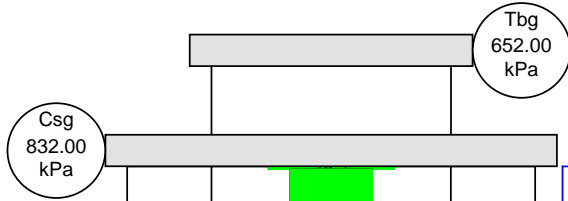
## Comments

The valve checks indicate that the downhole pump has a slight trave valve leak. This is considered normal for high watercut wells.

Golden Company Ltd.

Downhole: 100/00-00-000-00 WOM/00

Surface: 00-00-000-00 WOM



Elevations:  
 KB (m): 984.00  
 CF (m): 979.50

Casing:  
 OD (mm): 139.70  
 ID (mm): 122.58  
 Weight(kg/m): 23.10  
 Depth (mKB): 2350.00

Tubing:  
 OD (mm): 73.00  
 ID (mm): 62.00  
 Weight(kg/m): 9.67  
 Depth (mKB): 2289.10  
 Number of Jts: 241

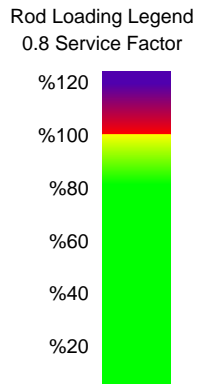
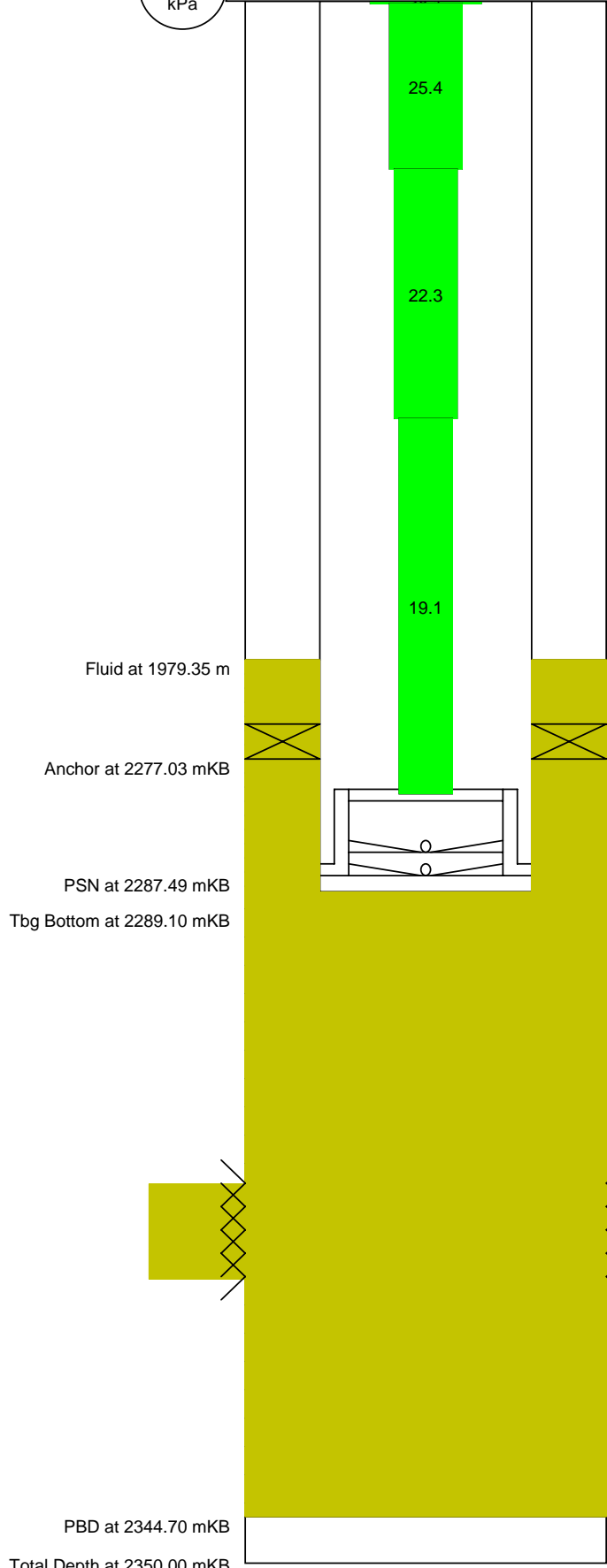
Liner:  
 ID (mm): 0.00  
 Top (mKB): 0.00  
 Bottom(mKB): 0.00

Type	Scraper	Rod String Rod Dia. (mm)	# Rods	Length (m)
STEEL C	No	38.10	1	9.81
NORRIS 97	No	25.40	2	1.22
NORRIS 97	Yes	25.40	62	472.44
NORRIS 97	No	22.20	94	716.28
NORRIS 97	No	19.10	141	1074.42

API Pump Description: 25-200 RWBC 20.0- 5.0- 0.0  
 PSN (mKB): 2287.49

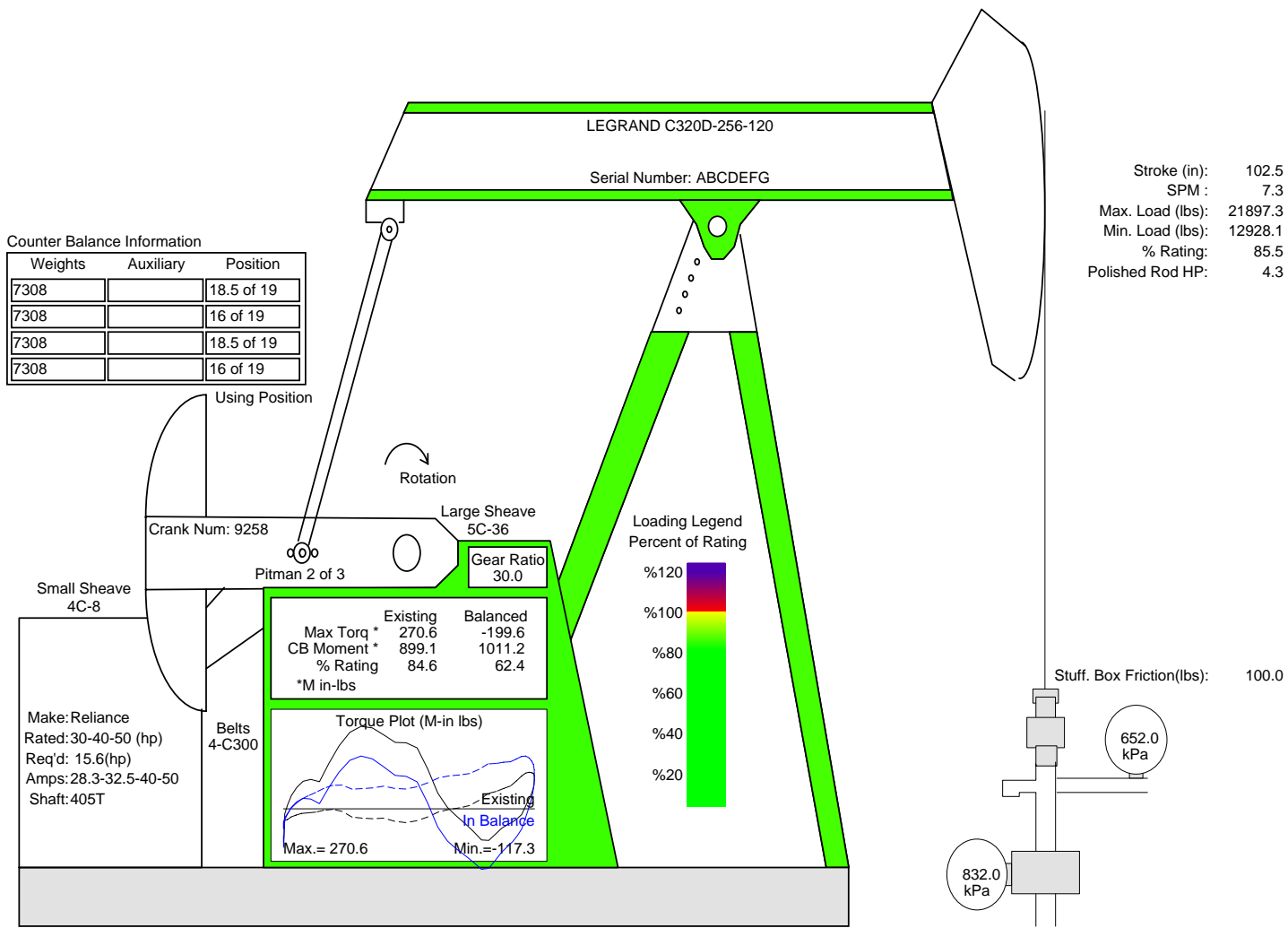
Perforations:  
 From (mKB) 2315.00 to 2323.50

A fish top @ 2289.98 mKB. The producing string has a perforated pup and the bottom is bull plugged.



Downhole: 100/00-00-000-00 WOM/00

Surface: 00-00-000-00 WOM



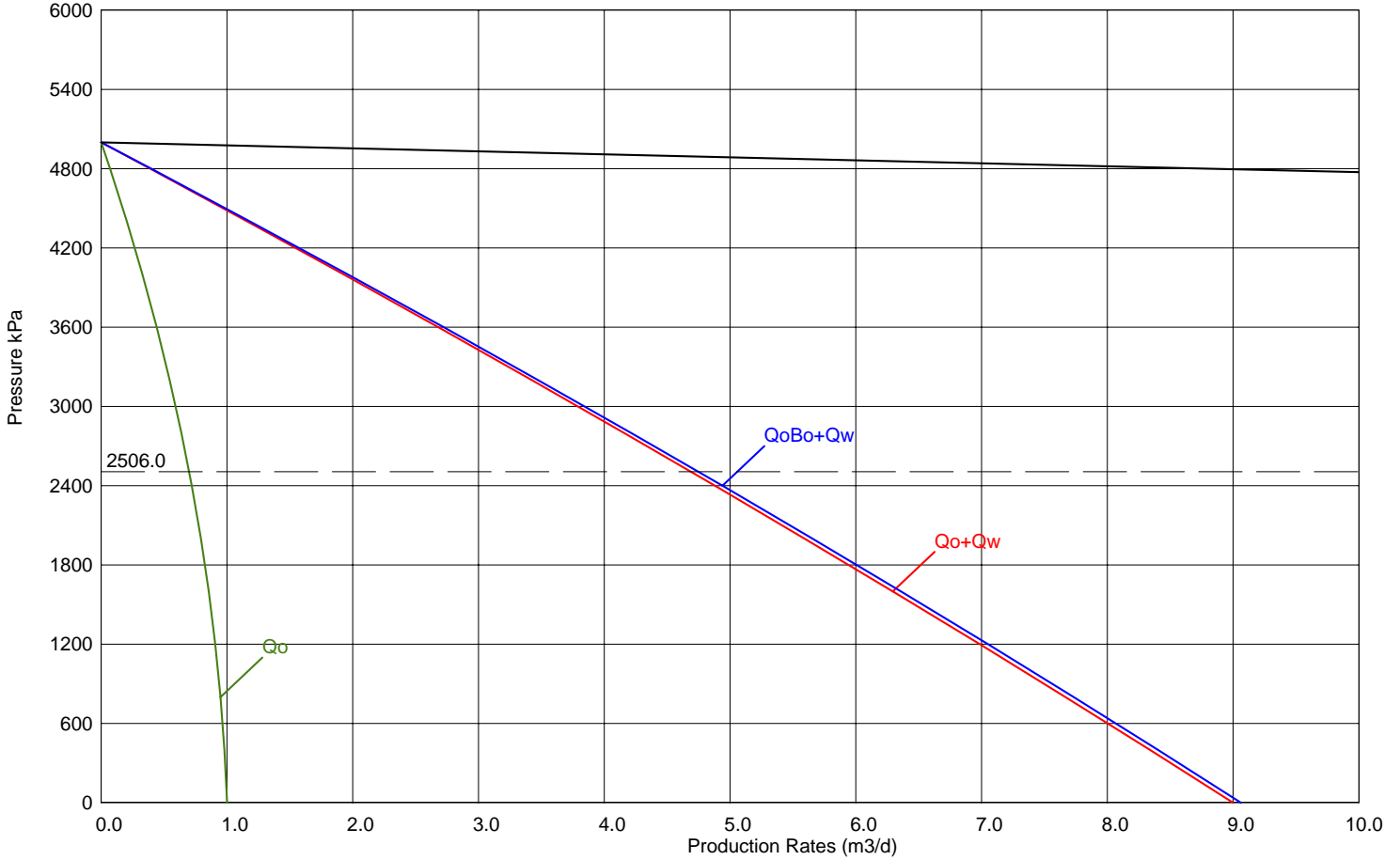


# Inflow Performance Relationship

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100/00-00-000-00 WOM/00  
xxxx-01-07



Producing Pressure vs. Production Rate



Pressure (kPa)	At Surface			At Reservoir Depth			
	Oil(Qo) (m3/d)	Water(Qw) (m3/d)	Qo+Qw (m3/d)	QoBo (m3/d)	QoBo+Qw (m3/d)	Gas(Qfg) (m3/d)	QoBo+Qw+Qfg (m3/d)
0	1.0	8.0	9.0	1.1	9.1	6338.9	6348.0
400	1.0	7.4	8.3	1.0	8.4	1244.3	1252.7
800	0.9	6.7	7.7	1.0	7.7	664.5	672.2
1200	0.9	6.1	7.0	1.0	7.1	436.5	443.5
1600	0.9	5.4	6.3	0.9	6.4	312.2	318.5
2000	0.8	4.8	5.6	0.9	5.7	232.4	238.1
2400	0.7	4.2	4.9	0.8	4.9	176.0	180.9
2800	0.6	3.5	4.2	0.7	4.2	133.2	137.4
3200	0.5	2.9	3.4	0.6	3.5	99.2	102.7
3600	0.4	2.2	2.7	0.5	2.7	71.1	73.9
4000	0.3	1.6	1.9	0.4	2.0	47.3	49.3
4400	0.2	1.0	1.2	0.2	1.2	26.7	27.9
4800	0.1	0.3	0.4	0.1	0.4	8.4	8.8
5000	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Production(m3/d)  
Oil 0.70  
Water 3.99  
Gas (E3) 3.75

Pressures(kPa)  
Reservoir 5000.00  
PBHP 2506.00

Well Parameters  
Gas Gravity 0.73  
Oil Gravity (API) 26.80  
Res. Temp (C) 68.000