



TITAN
Oil Recovery, Inc.

Global Oil Field Success
Organic Oil Recovery

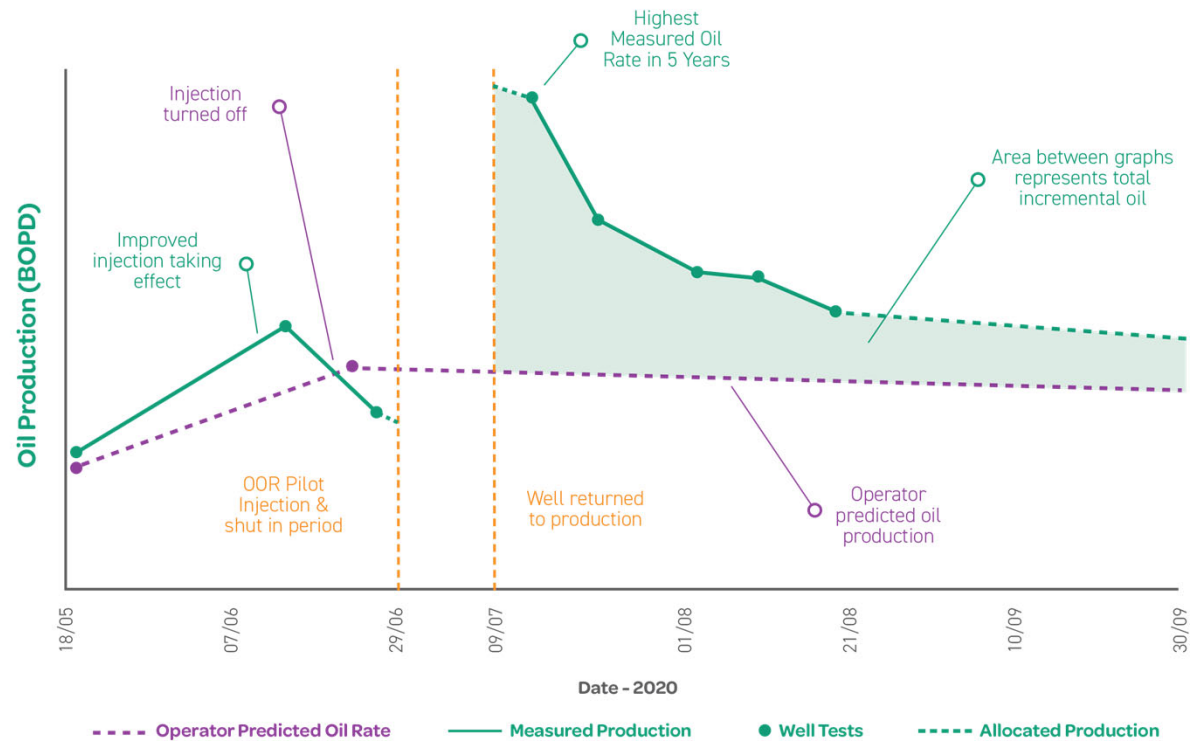


Organic Oil Recovery

Pilot Results – Incremental Oil Production CNOOC North Sea Scott Platform

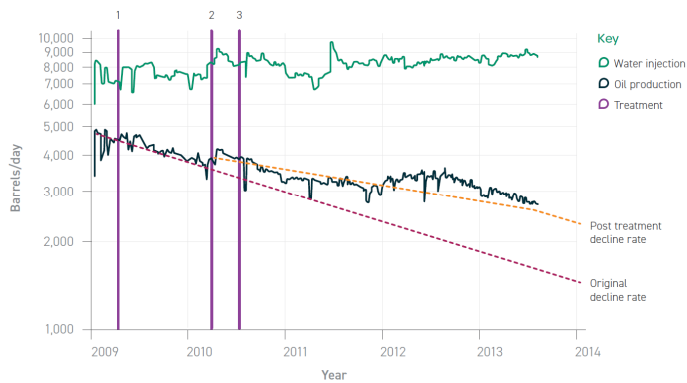
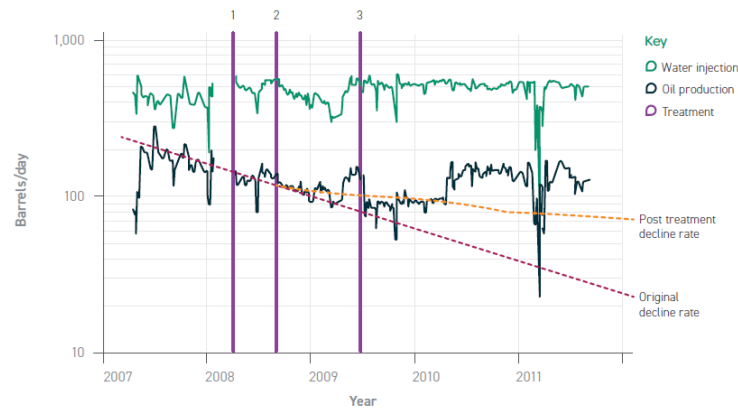

>25,000
 barrel incremental


< 1 week
 payback

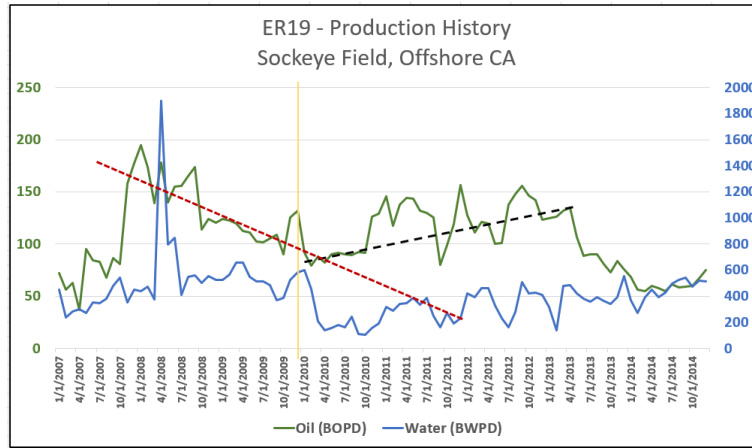


Organic Oil Recovery (OOR)

Treatment Analogues – Targeted Water Flood



- California, Dos Cuadras – incremental revenue of \$3.3m over 2 years
- Venoco Gail, Offshore California incremental revenue of \$6.4m
- Sockeye, Offshore California – incremental revenue of \$4.3m in 3 years



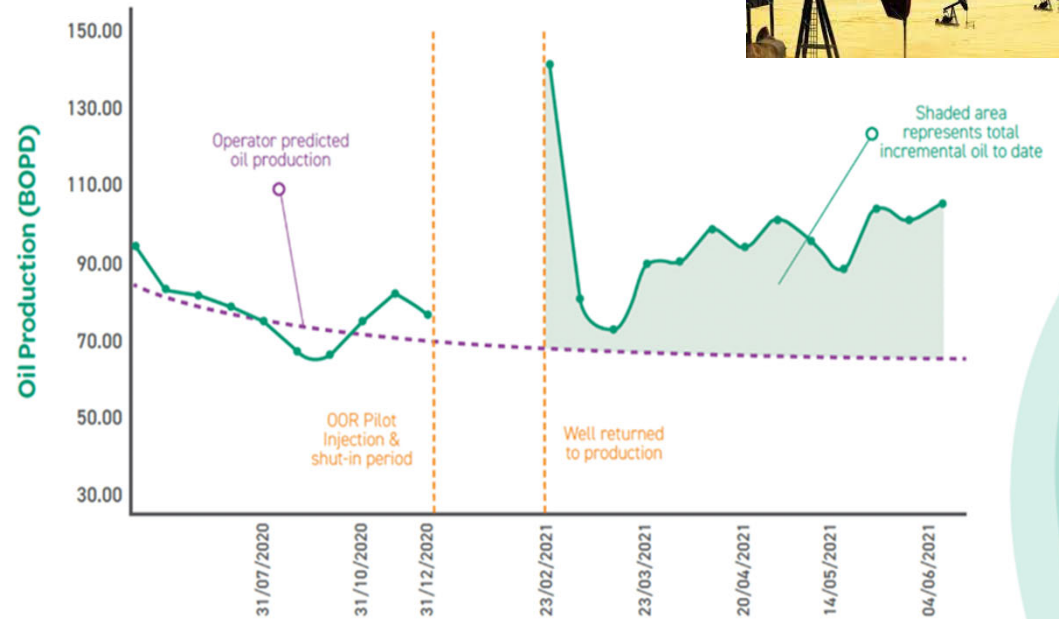
Independent Oil Company

Mideast Pilot Well
Serviced in 2021

4,000 bbls. of Incremental Oil
Production Increases 47%
for 5 months
Over 700% Return on
Investment to Operator



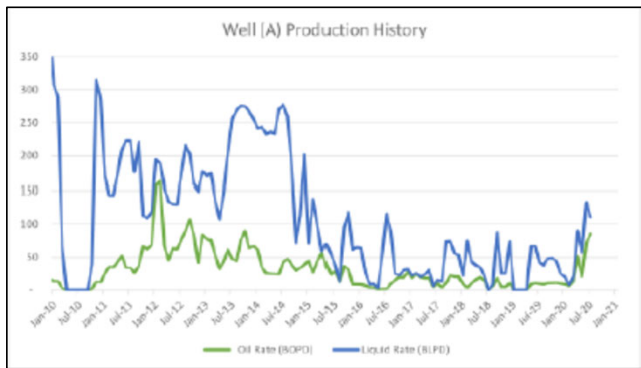
RESULTS/INCREMENTAL OIL PRODUCTION



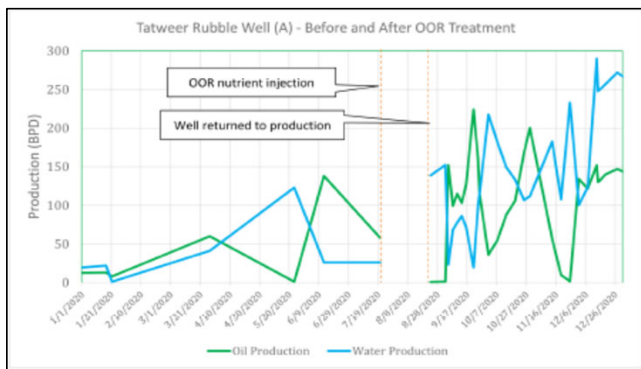

Bahrain National Oil Company SPE Paper 204884-MS

Forecasted Production 10 bopd, Organic Oil Recovery Delivers 148 bopd

Long-Term Decline Forecasted to 10 bopd



Oil Production Improves Dramatically for 5 Months to 148 bopd

Society of Petroleum Engineers

SPE-204884-MS

Organic Oil Recovery - Resident Microbial Enhanced Production Pilot in Bahrain

Christopher Venske, Hunting – Organic Oil Recovery; Ali Mohamed, Ammar Shaban, and Nelson Maan, Tatweer Petroleum; Dr. Colin Hill and Michael Carroll, Titan Oil Recovery; Roger Findlay, Hunting – Organic Oil Recovery

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Abstract

Tatweer Petroleum has been involved in a Pilot study to determine the efficacy of Organic Oil Recovery (OOR), a unique form of microbial enhanced oil recovery as a means of maximising oil recovery from its Rubble reservoir within the Awali field.

OOR harnesses microbial life already present in an oil-bearing reservoir to improve oil recovery through changes in interfacial tensions, which in the case of Rubble will increase the heavy oil's mobility and improve recovery rates and reservoir wettability. These changes could increase recoverable reserves and extend field life through improved oil recovery with negligible topsides modifications. The Pilot injection is implemented by injecting a specific nutrient blend directly at the wellhead with ordinary pumping equipment. The well is then shut-in for an incubation period and thereafter returned to production.

In Tatweer Petroleum's Awali field the Rubble reservoir is one of the shallowest oil reservoirs in the Bahrain and the first oil discovery in the Gulf Cooperation Council (GCC) region. The reservoir can be found at depths of around 1400 – 1900 ft. During initial laboratory testing of the Rubble target wells the reservoir showed a diverse and abundant resident ecology which has been proven capable of undergoing the necessary characteristic changes to facilitate enhanced production from the target wells. The Pilot test on one of these wells, called Well (A) within this paper, took place in July 2020 and due to this process, the ecology of this well showed these same changes in characteristics in the reservoir along with an associated oil response. The full method of implementation of the Pilot test will also be discussed in detail and will include any challenges and/or successes in this area. The initial state ecology reports of Well (A) are demonstrated and compared to that of post-Pilot test ecology. We also present the production figures for the well prior to and post the Pilot implementation. A correlation will be demonstrated between changes in ecology and an increase in production.

Reservoir Summary

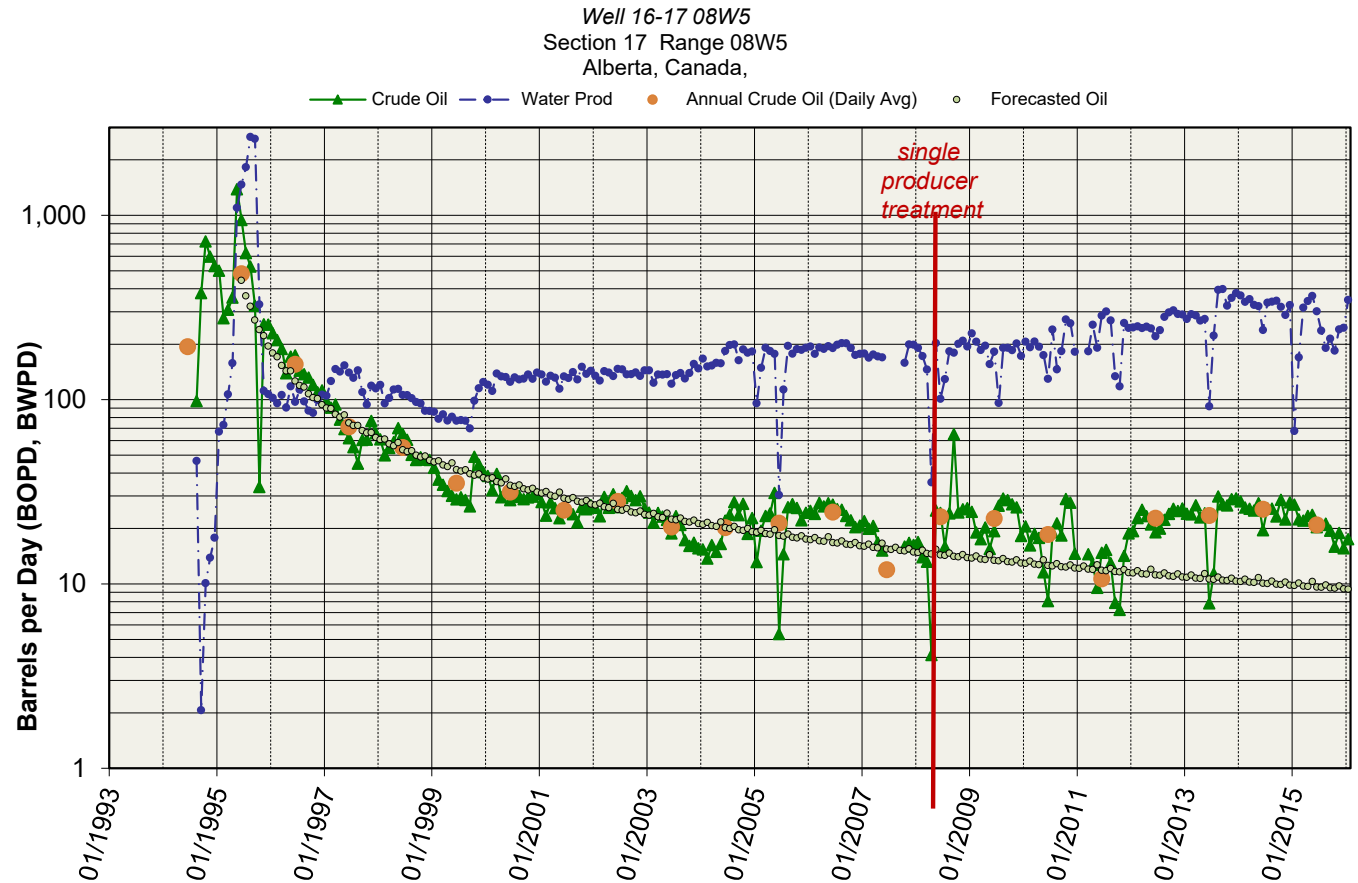
The Awali field contains multiple stacked oil & gas reservoirs within a faulted north-south trending anticline. It is assumed that all reservoirs are charged from the same deep source or sources via sequential vertical

SPE Paper Available at: www.titanoilrecovery.com



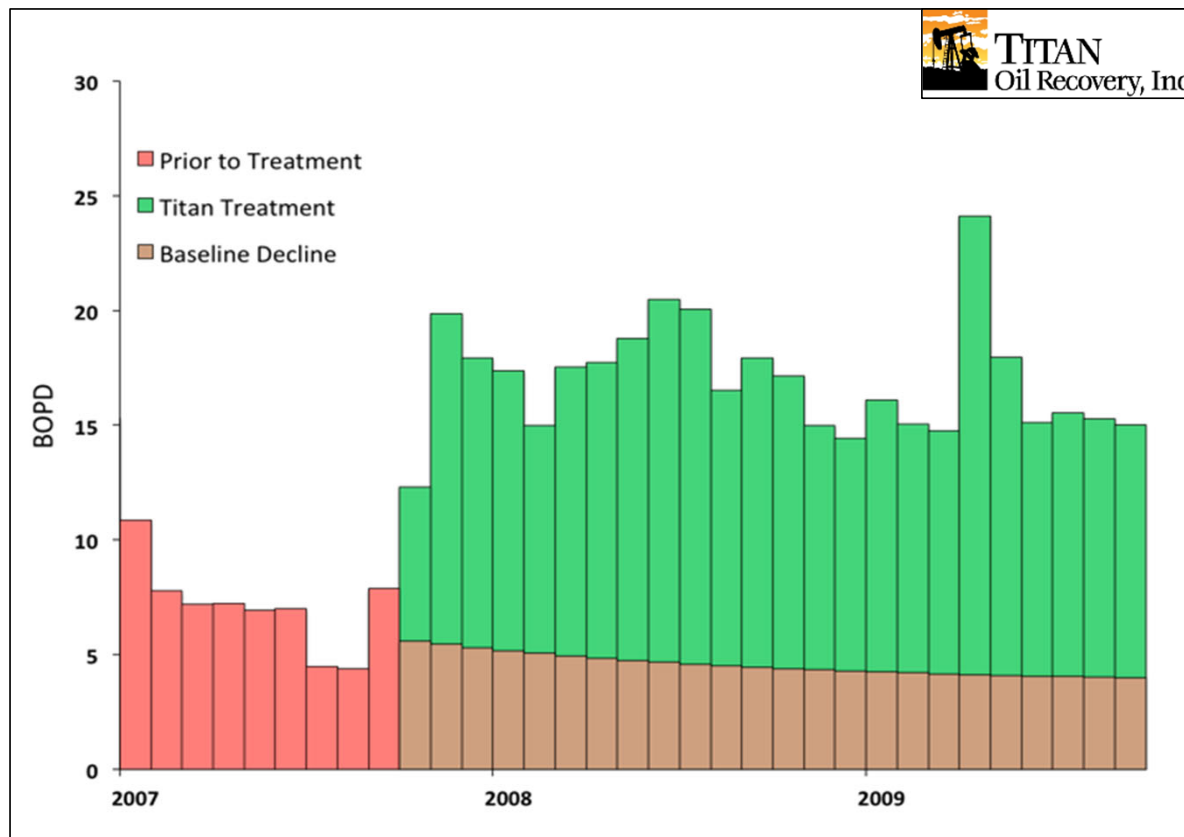
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This result shows a dramatic 8-year alteration of the previous 13-year decline. Production 8 years after the Titan Process is still above the oil production from the date of the single application and significantly above the expected decline for most of the 8 years.



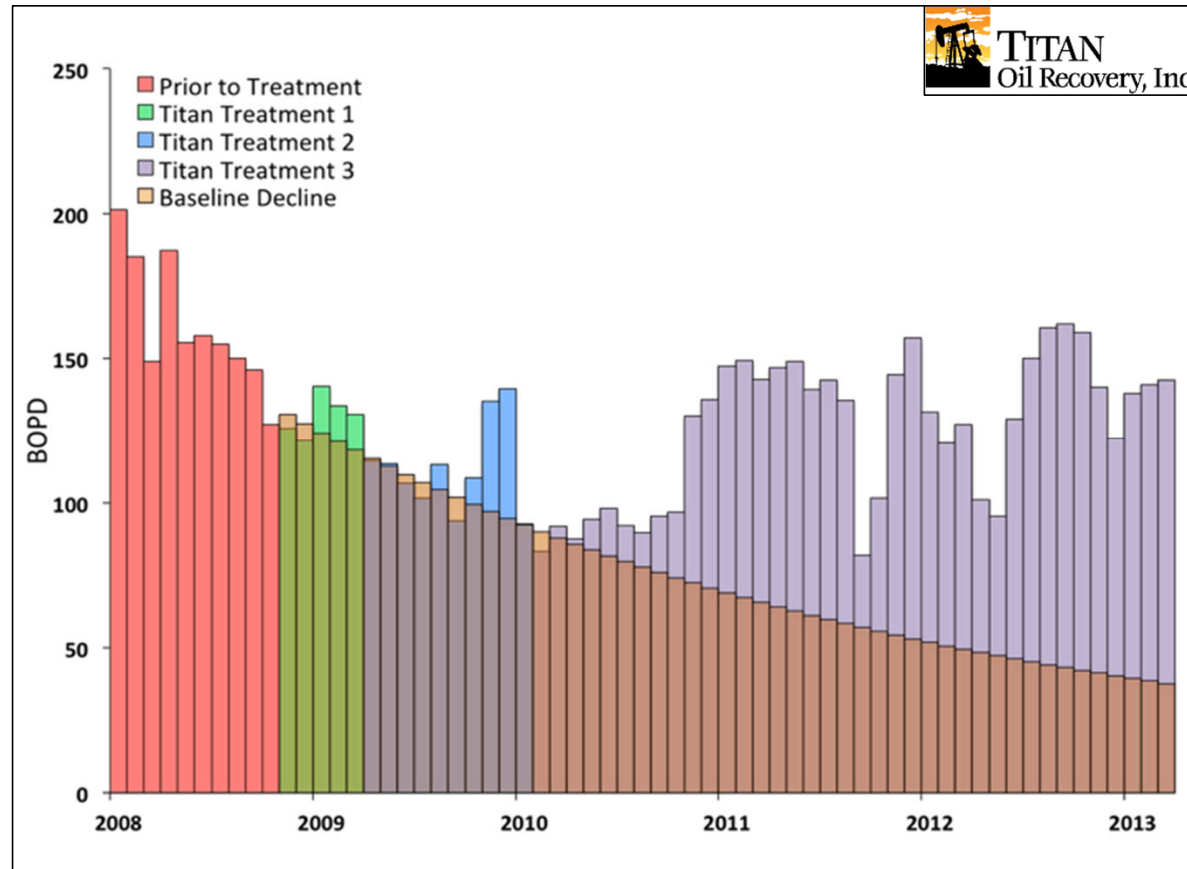
Saskatchewan Well Response to Titan Process

200% Production Increase lasting two years from One Treatment



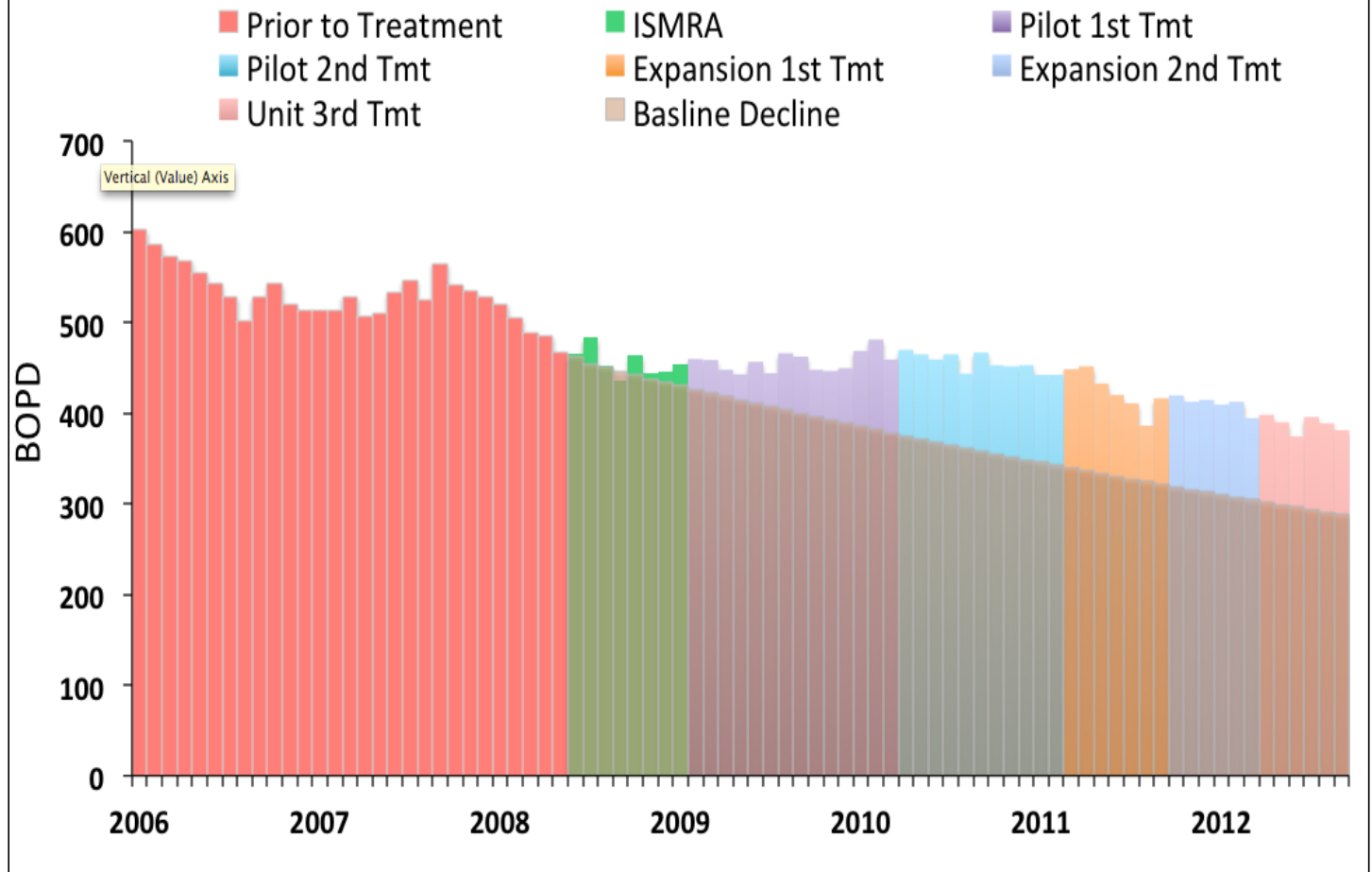
California Offshore Success with the Titan Process

Production up 200% three years after last treatment



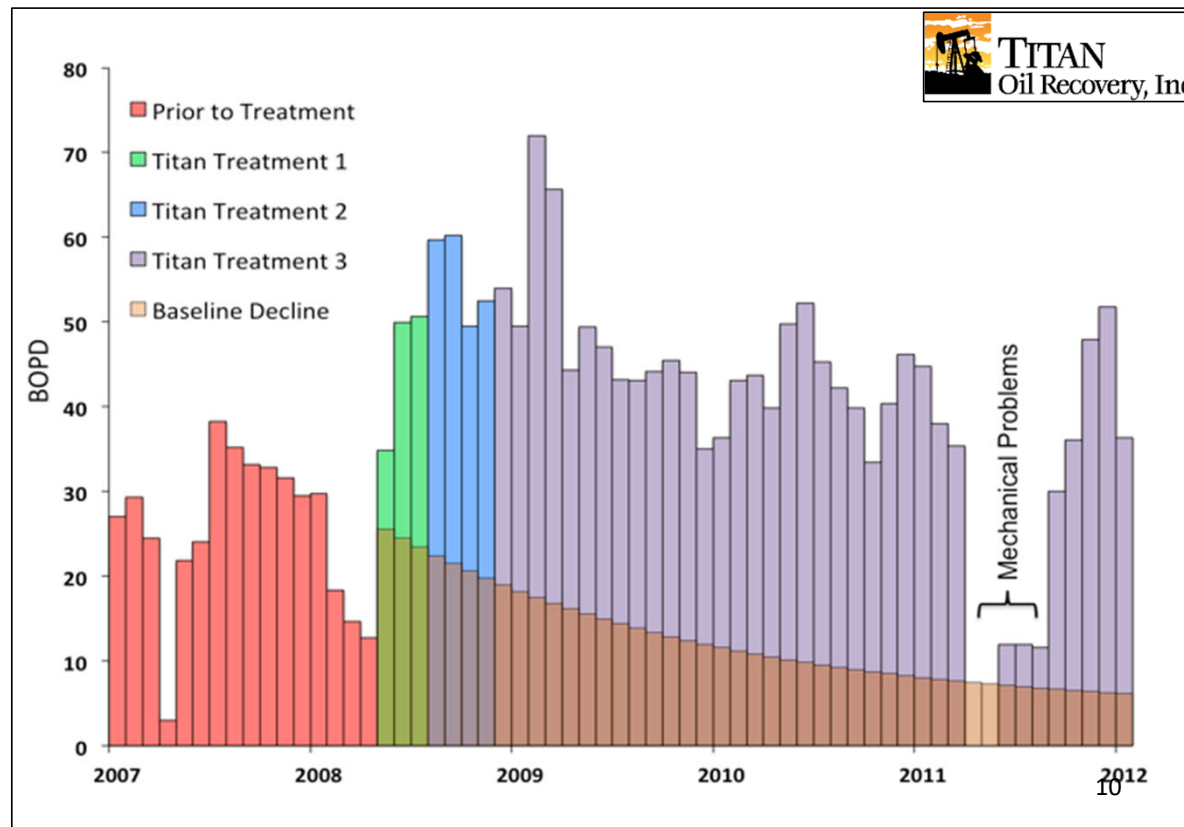


Canadian Unit Response to Titan Process

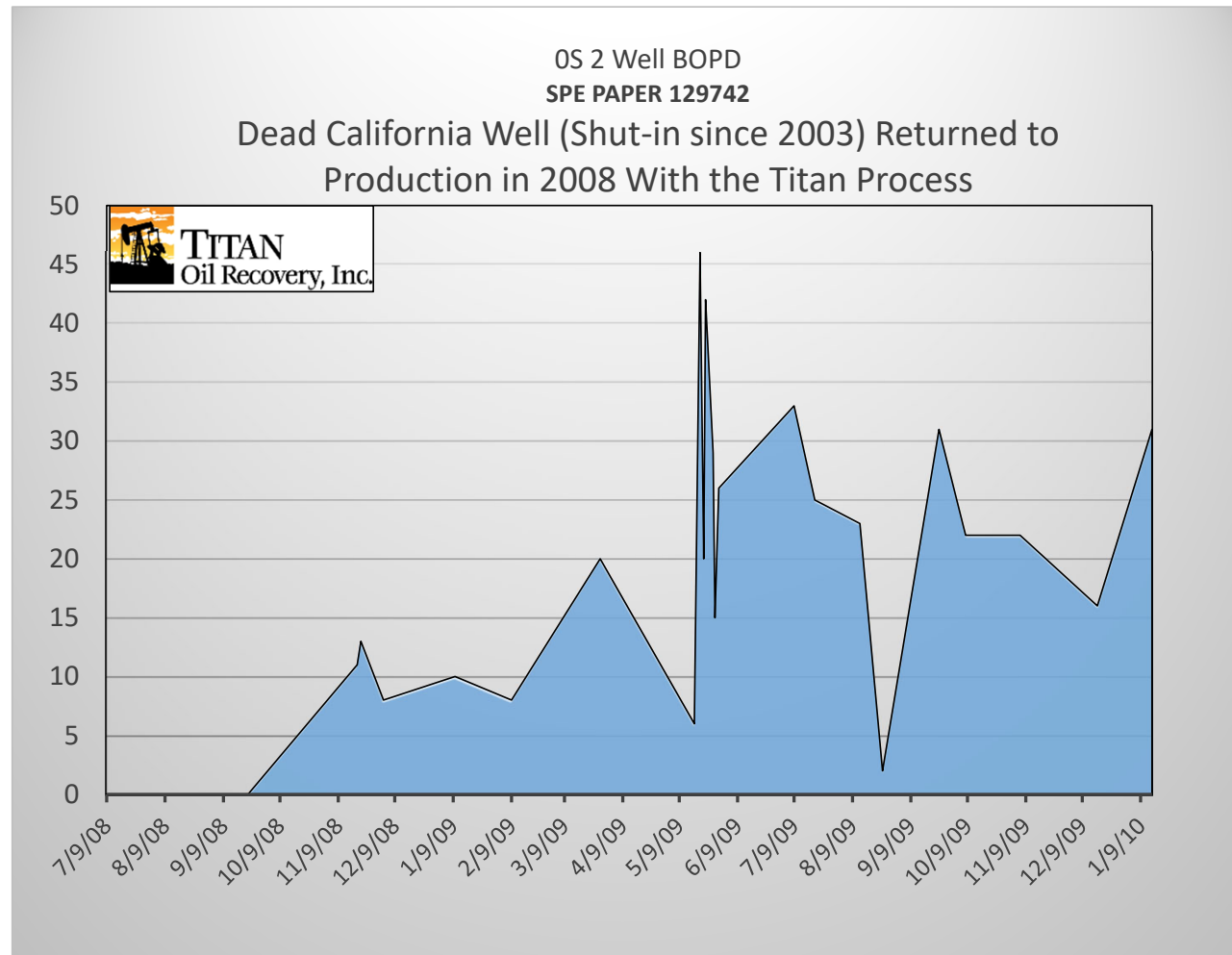


Approximately \$11 million of oil revenue to the operator from \$3.5 million Titan cost.

Canadian Water Injector Treatment Impacts Offset Producer Production up 300%, three years after last treatment

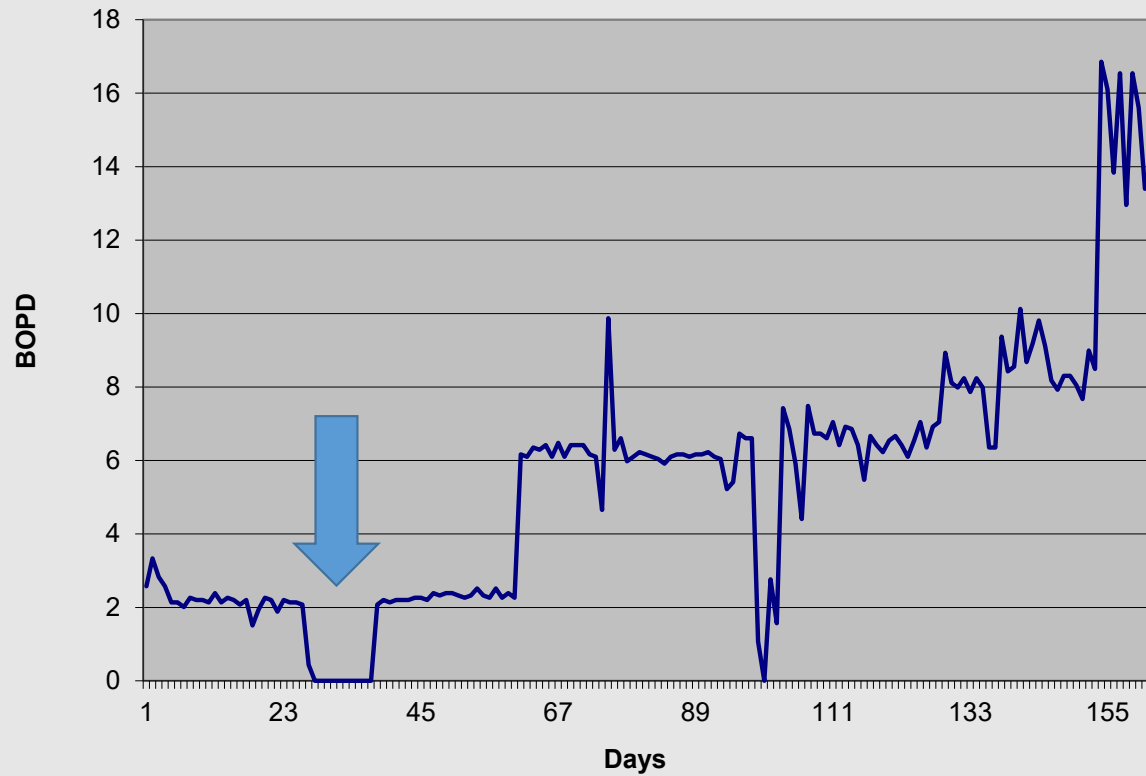


Dead Well Revived.
Graph depicts the Table
presented in SPE Paper
129742 MEOR Success in
Southern California.
Venoco Inc.





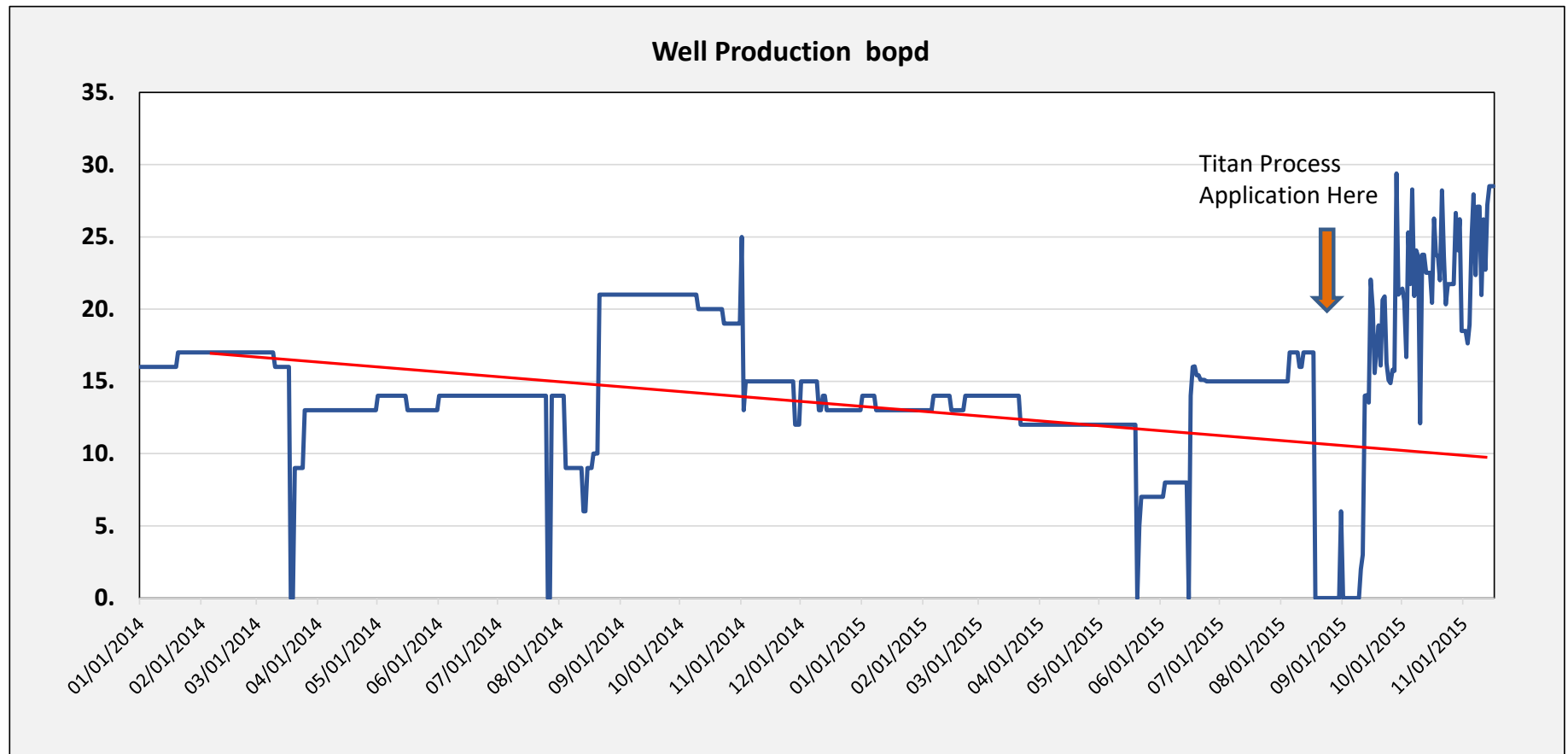
Canada Shut In Well Barrels of Oil Per Day Improvement after Titan



**Extraordinary Response
from Shut in well.
See SPE Paper 124319
Husky Energy**

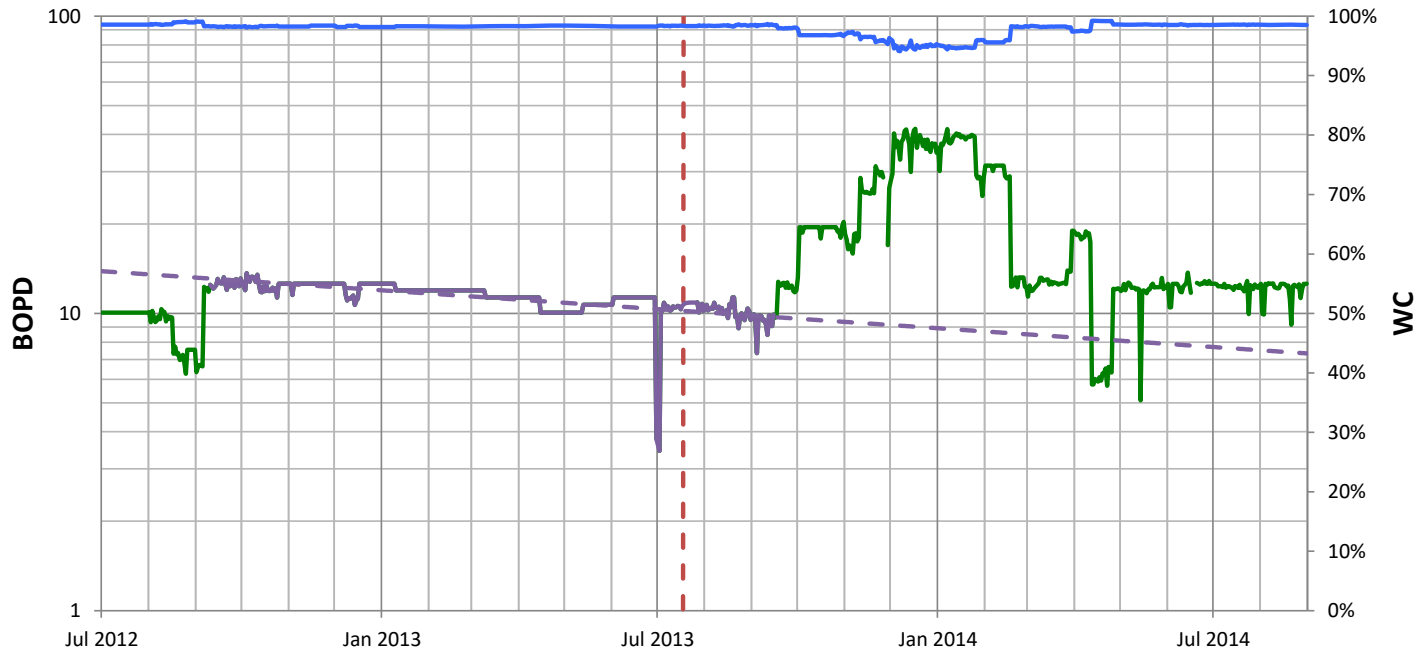
Continued Success in Indonesia

Production well now producing 140% above baseline four months after Titan Process application. Blue line is oil production, Red line is 18 month decline curve





Field 43, Well 2 - Saskatchewan, Canada

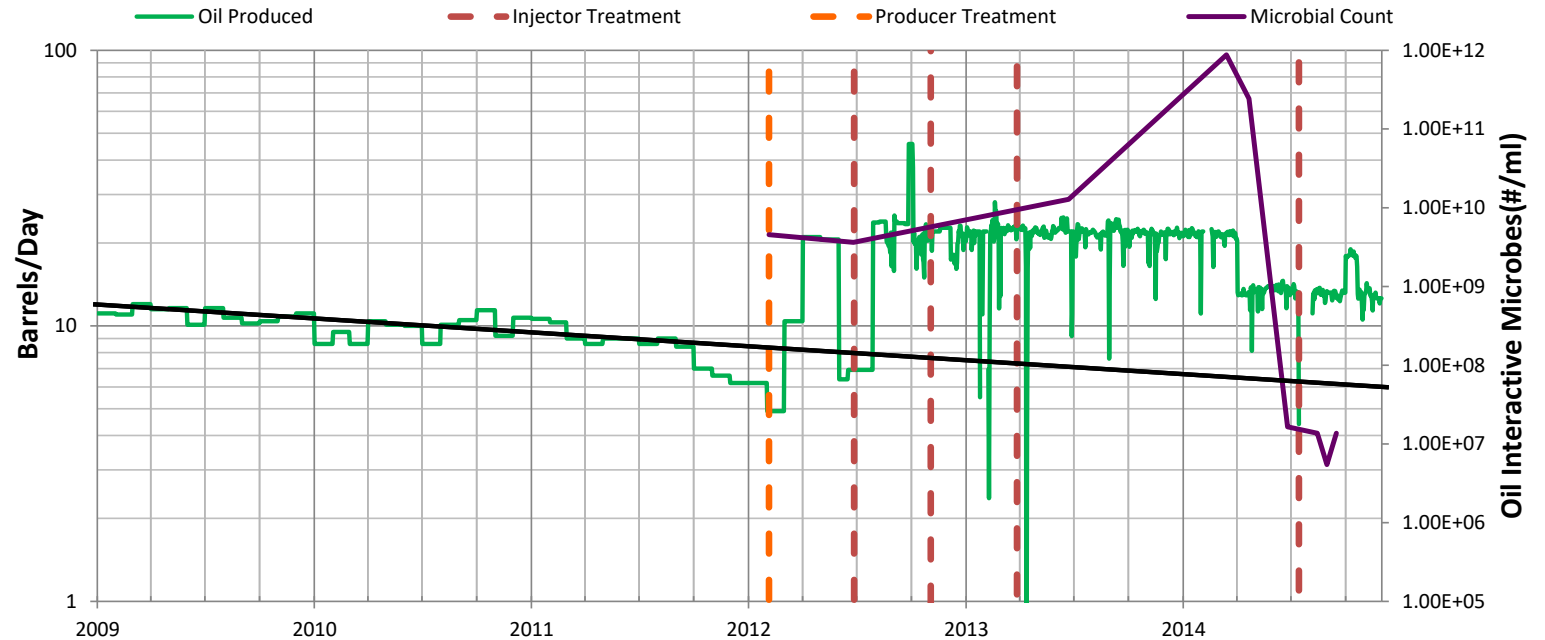


BH TEMP	138°F (59°C).
API Gravity	23.1°
Viscosity	9cp
Permeability	209md
TDS	15,966 mg/L



Field 33, Well 1 - Saskatchewan, Canada

Notice dramatic reduction in targeted microbial population and oil production still well above baseline and 100% higher than three years ago.



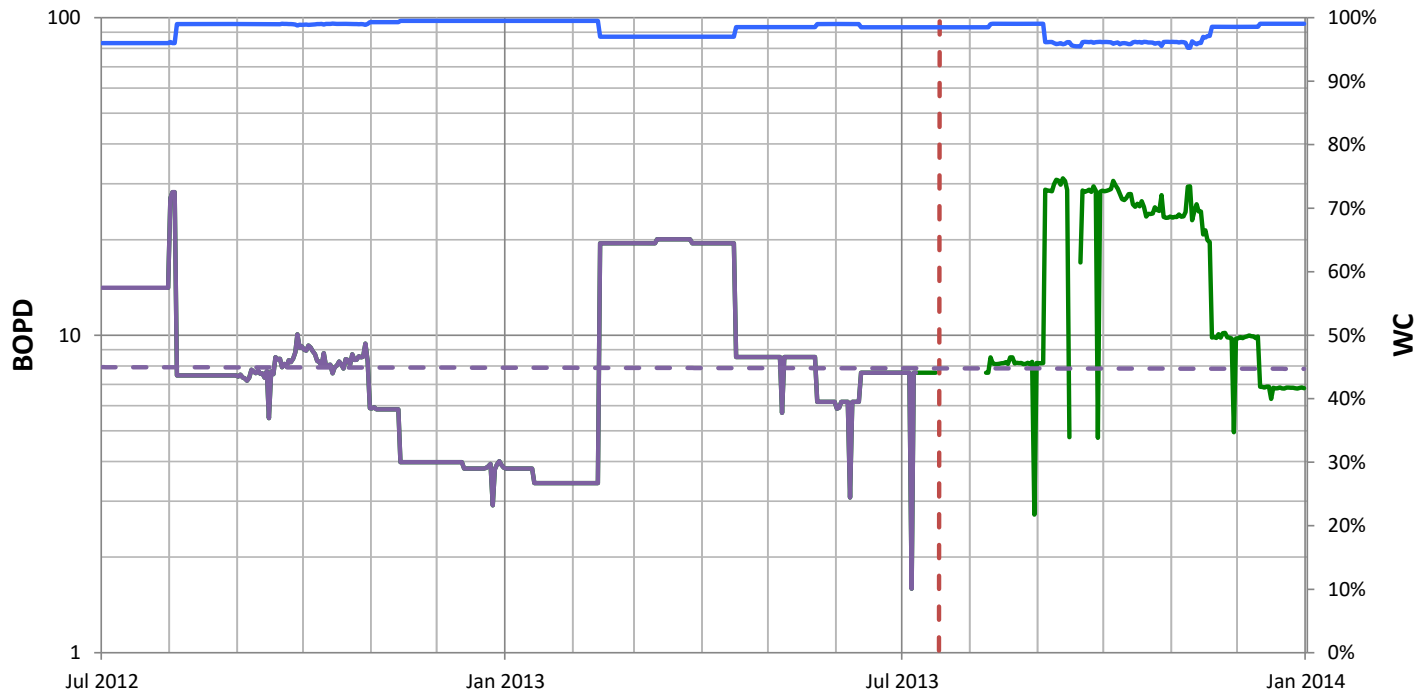
BH TEMP	131°F (55°C).
API Gravity	23°
Viscosity	10cp
Permeability	50md
TDS	7,200 mg/L



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Field 42 - Saskatchewan, Canada

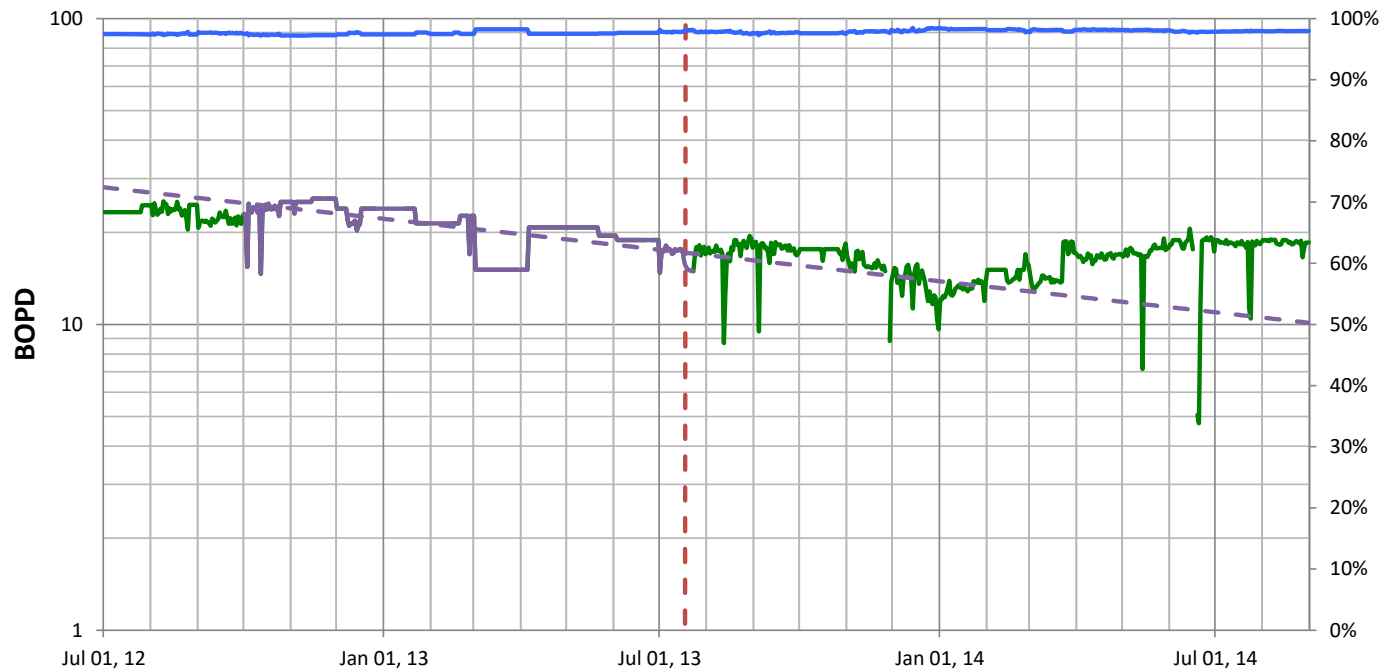


BH TEMP	120°F (49°C).
API Gravity	23.3°
Viscosity	15cp
Permeability	25md
TDS	13,576 mg/L



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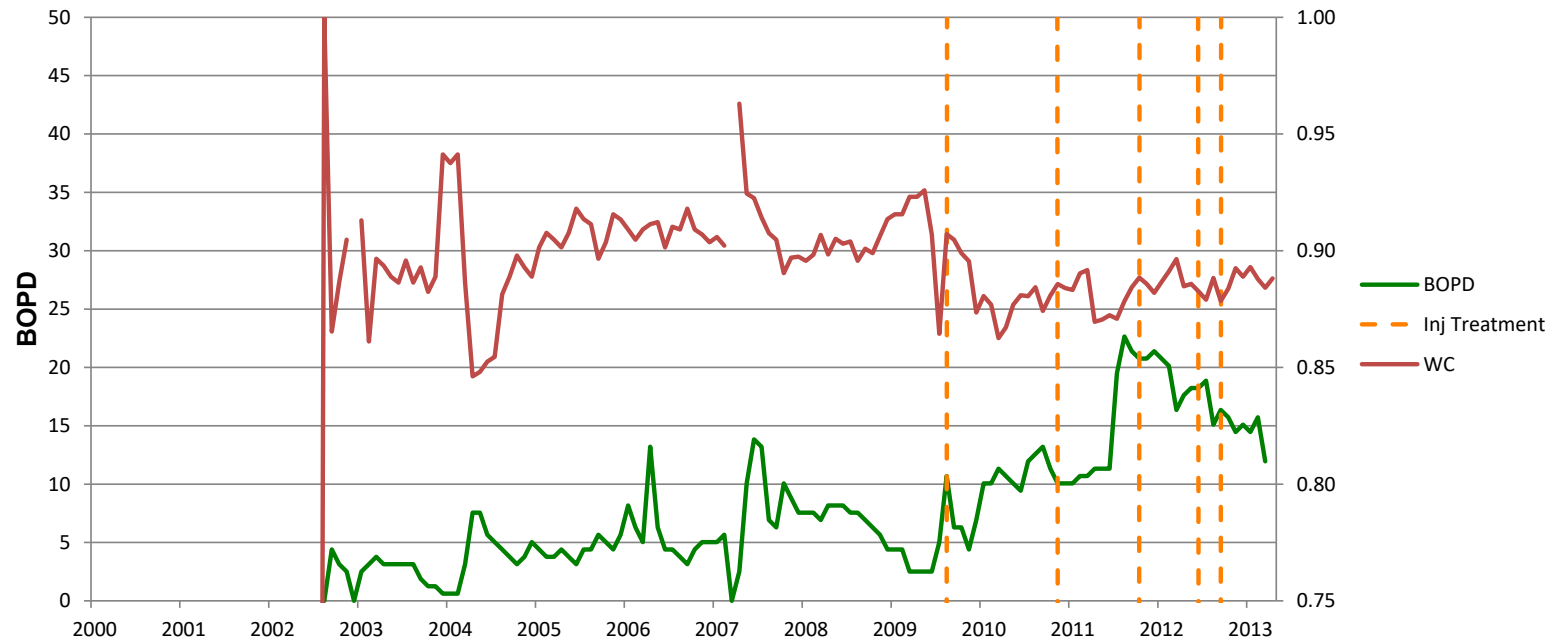
Field 43, Well 3 - Saskatchewan, Canada



BH TEMP	138°F (59°C).
API Gravity	23.1°
Viscosity	9cp
Permeability	209md
TDS	15,966 mg/L



Field 10, Offset Producer 2 - Alberta, Canada



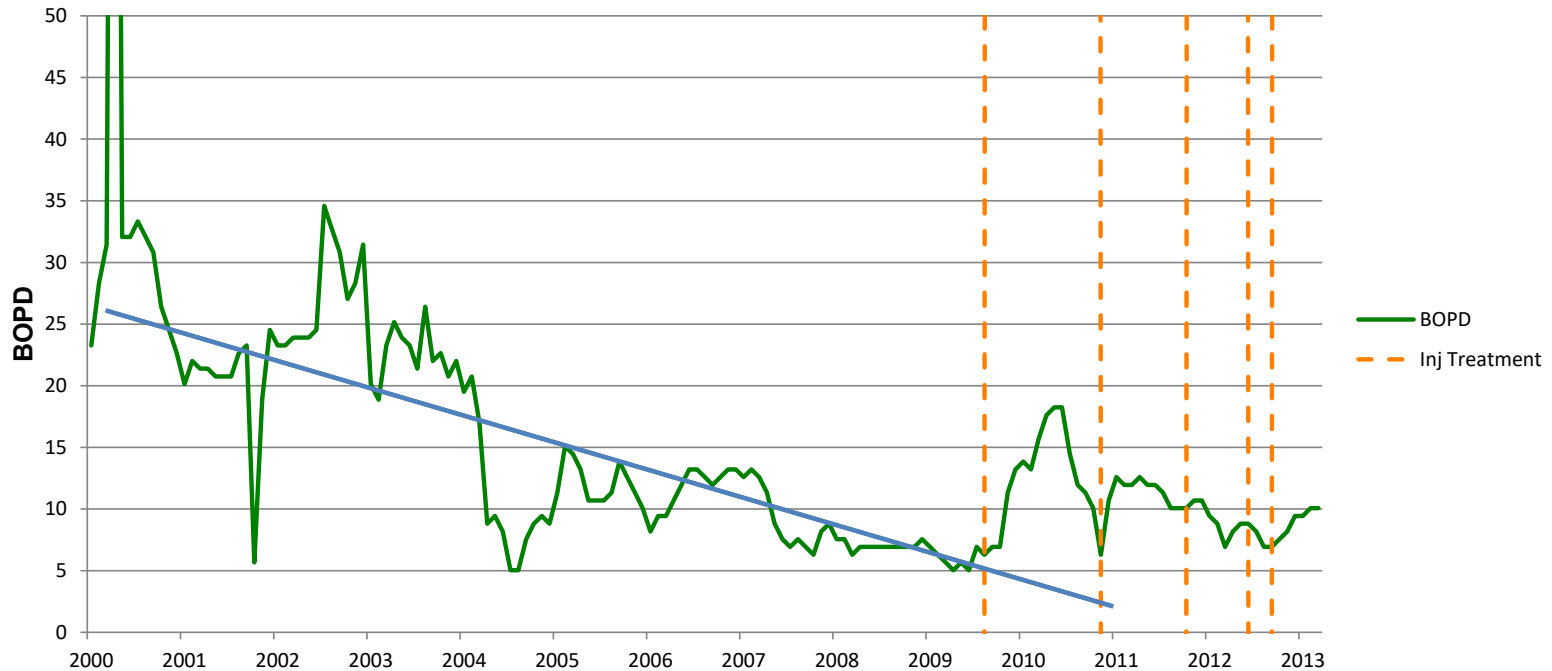
This Producer increased 700% in two years from 2 applications. Water declined during this time.

BH TEMP	79°F (26°C).
API Gravity	20°
Viscosity	26cp
Permeability	600md
TDS	69,000 mg/L



TITAN Oil Recovery, Inc.

Field 10, Offset Producer - Alberta, Canada

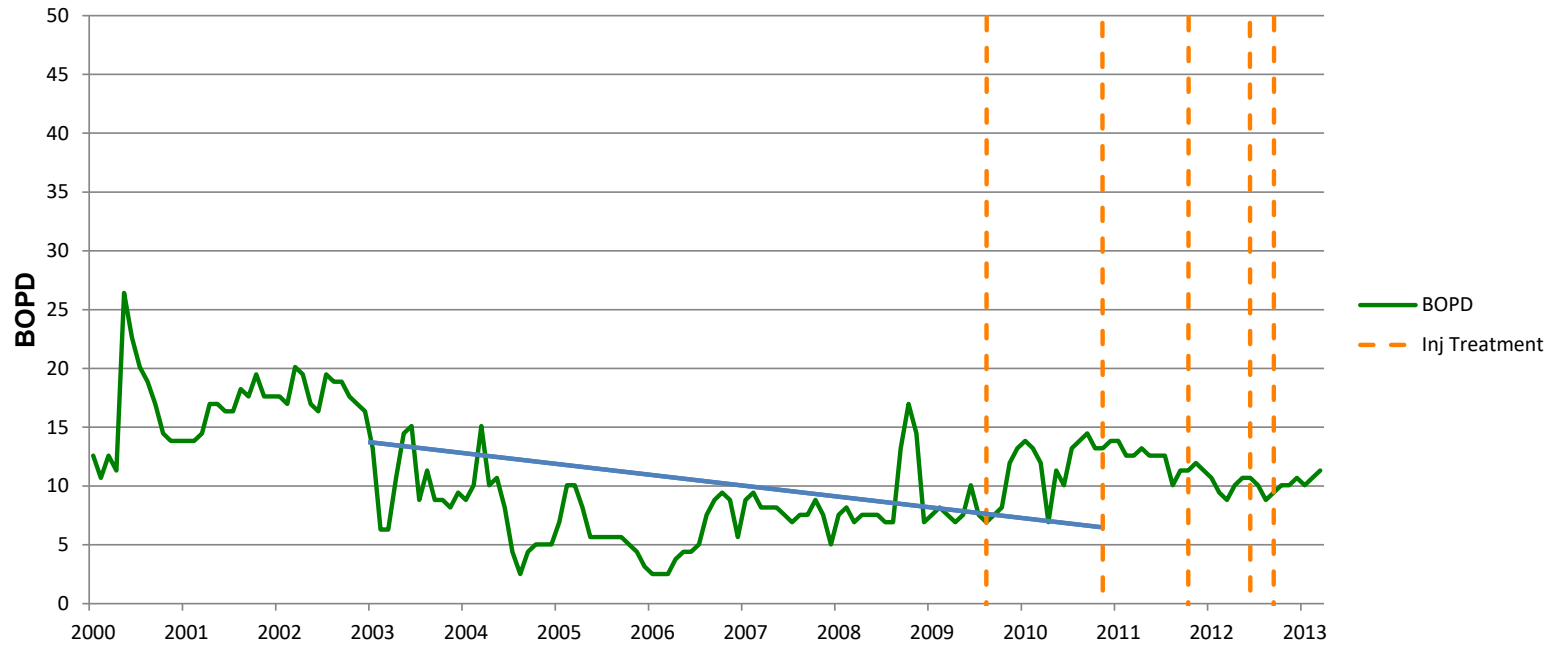


BH TEMP	79°F (26°C).
API Gravity	20°
Viscosity	26cp
Permeability	600md
TDS	69,000 mg/L



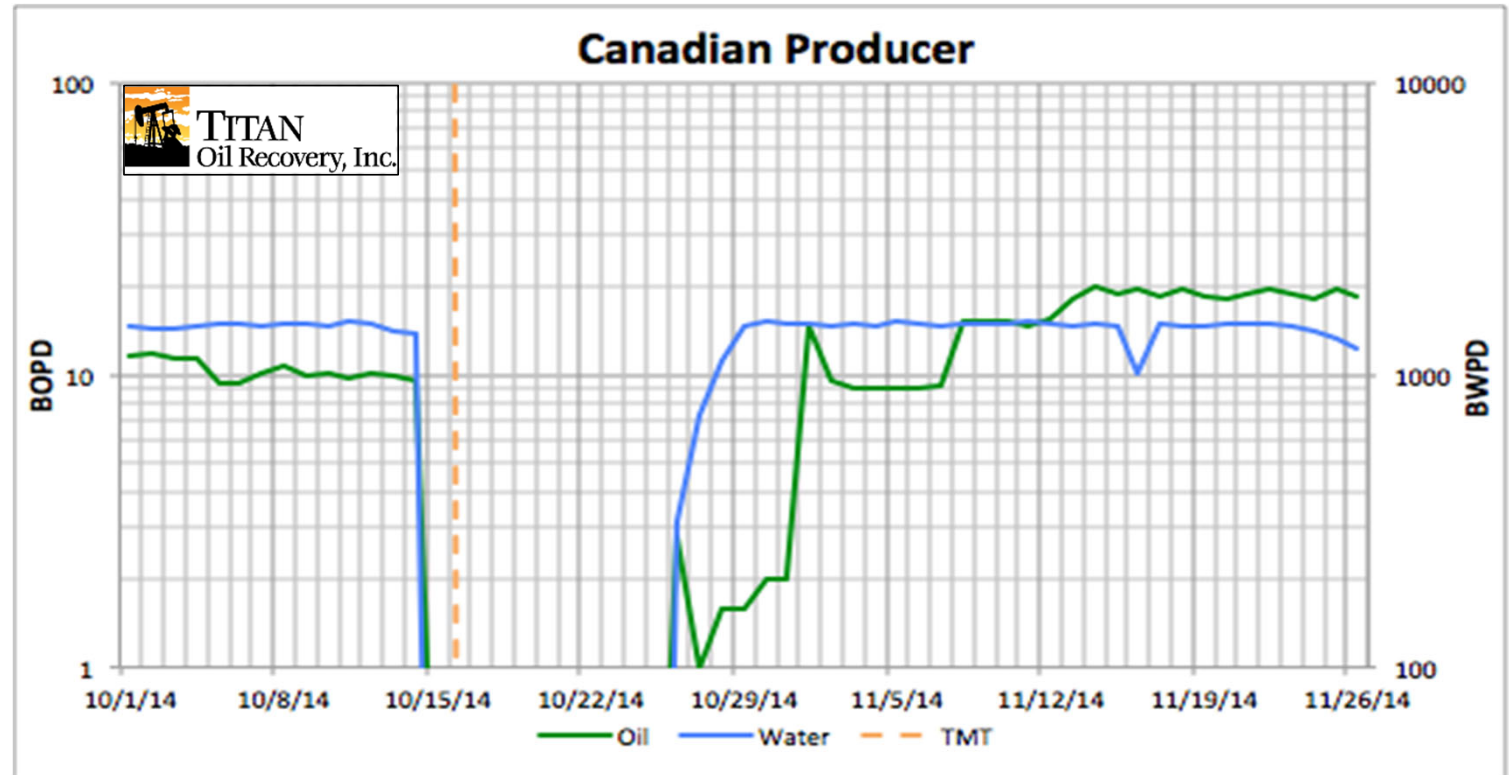
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Field 10, Offset Producer - Alberta, Canada



BH TEMP	79°F (26°C).
API Gravity	20°
Viscosity	26cp
Permeability	600md
TDS	69,000 mg/L

100% Production Increase with lower water cut.



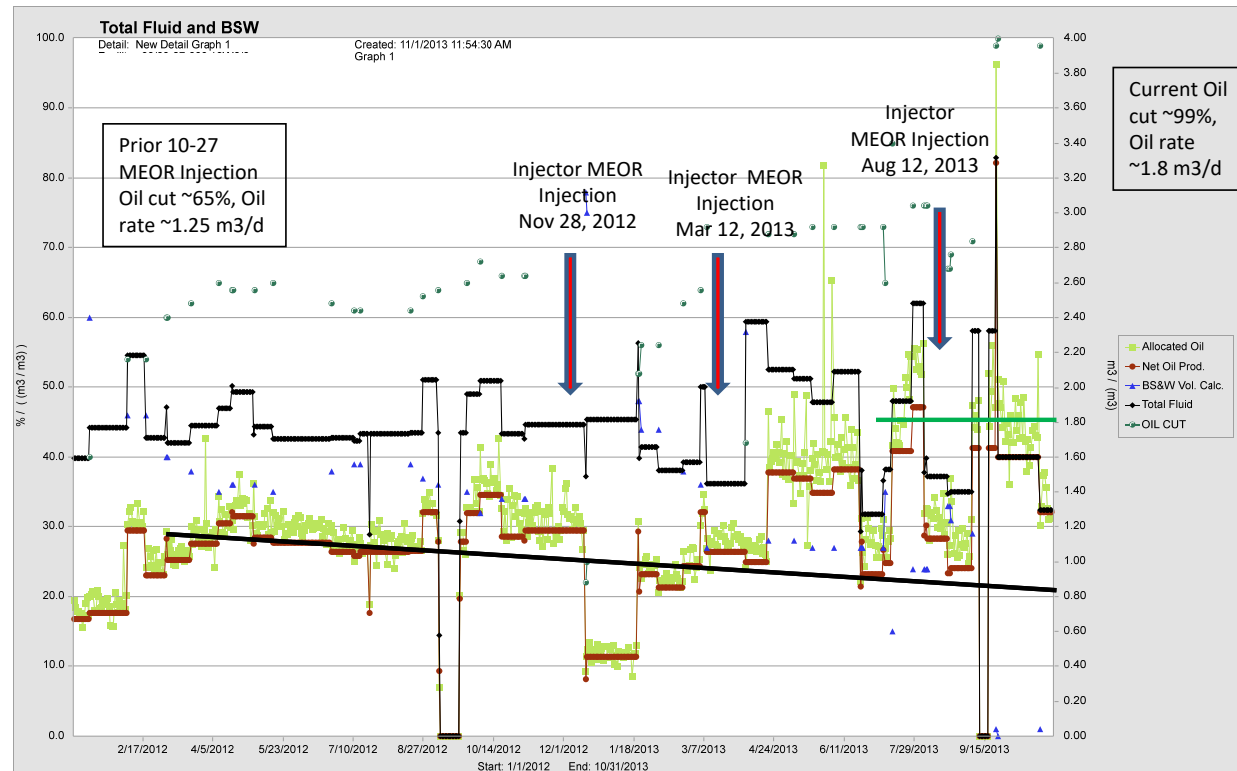


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**Field 37
British Columbia,
Canada**

**Continuous treatments defy
production decline.
Maroon line is oil production
From 189 bopd to 258 bopd.**

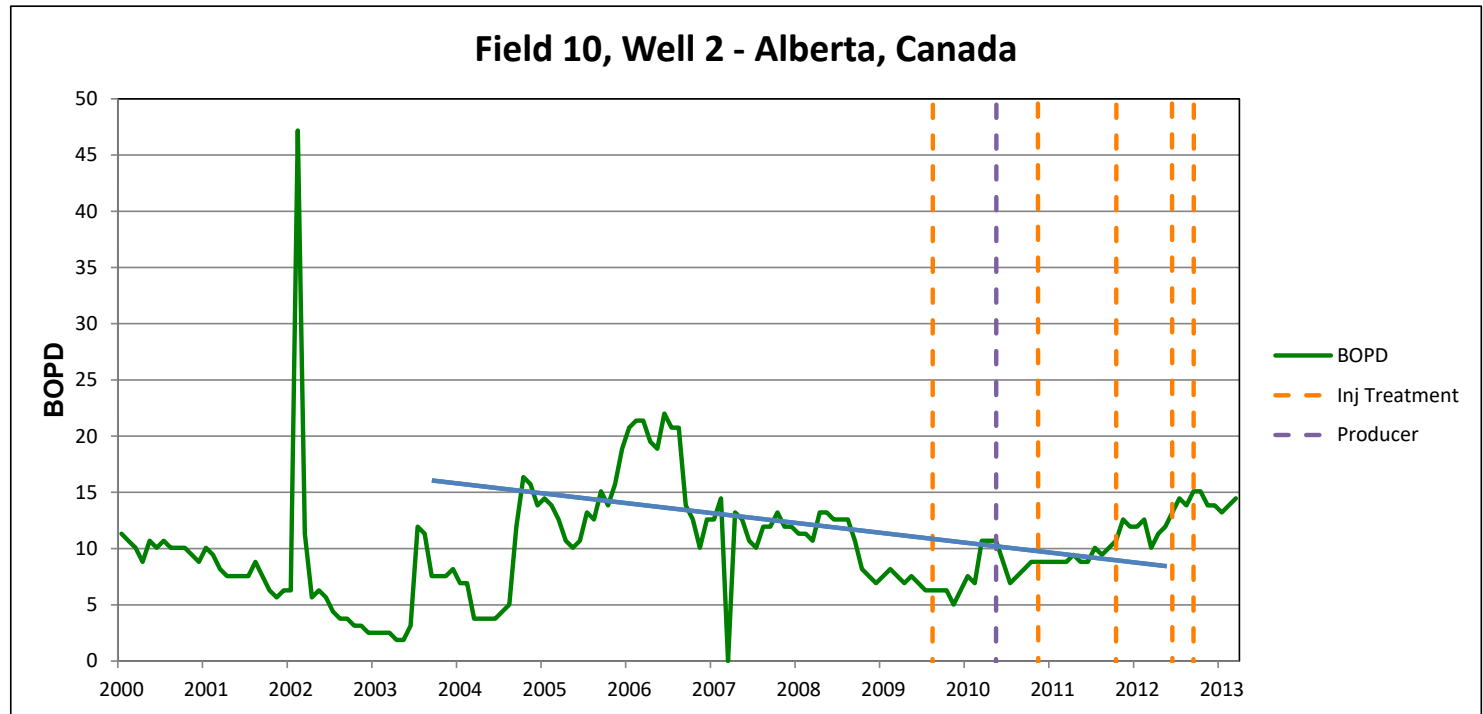
BH TEMP	123°F (51°C).
API Gravity	33°
Viscosity	-
Permeability	20-100 md
TDS	39,000 mg/L





TITAN Oil Recovery, Inc.

Graph shows continuing increases of production for multi-years defying the production decline.



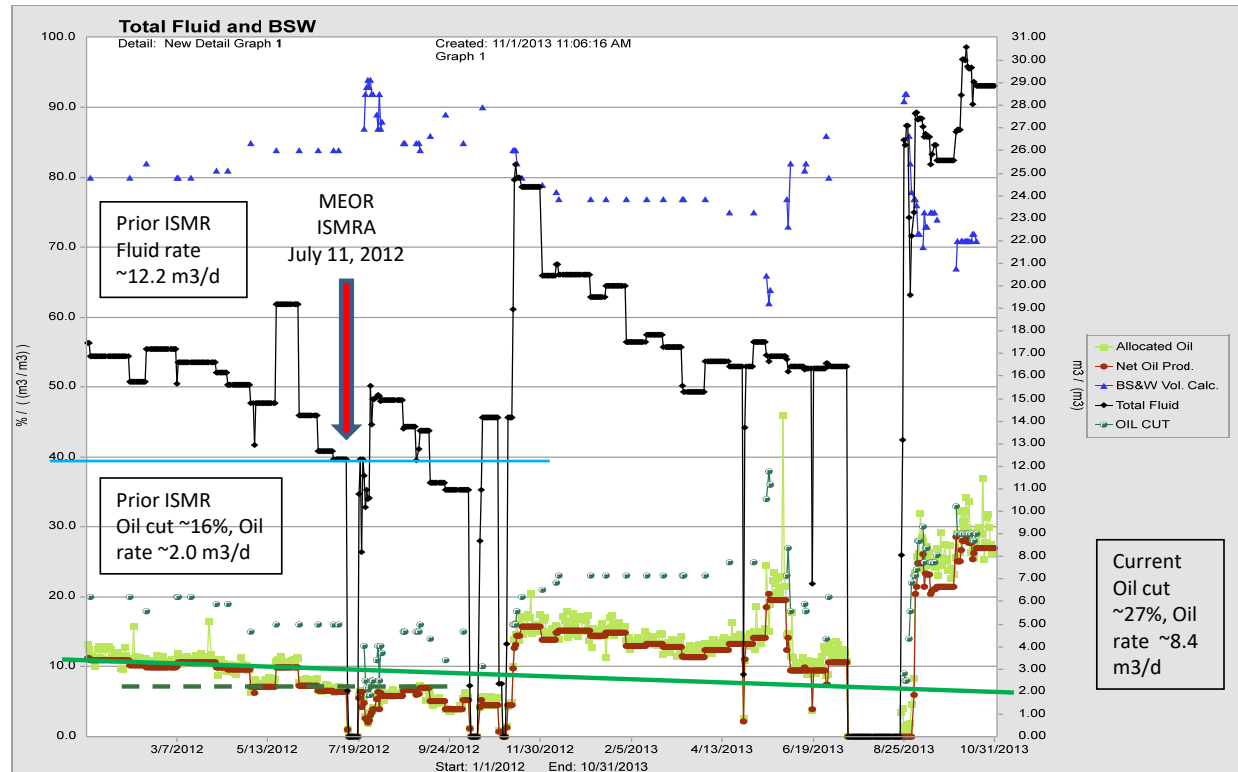
BH TEMP	79°F (26°C).
API Gravity	20°
Viscosity	26cp
Permeability	600md
TDS	69,000 mg/L



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**Field 39 Well Test
British Columbia,
Canada.
Production up 300%
in 15 months**

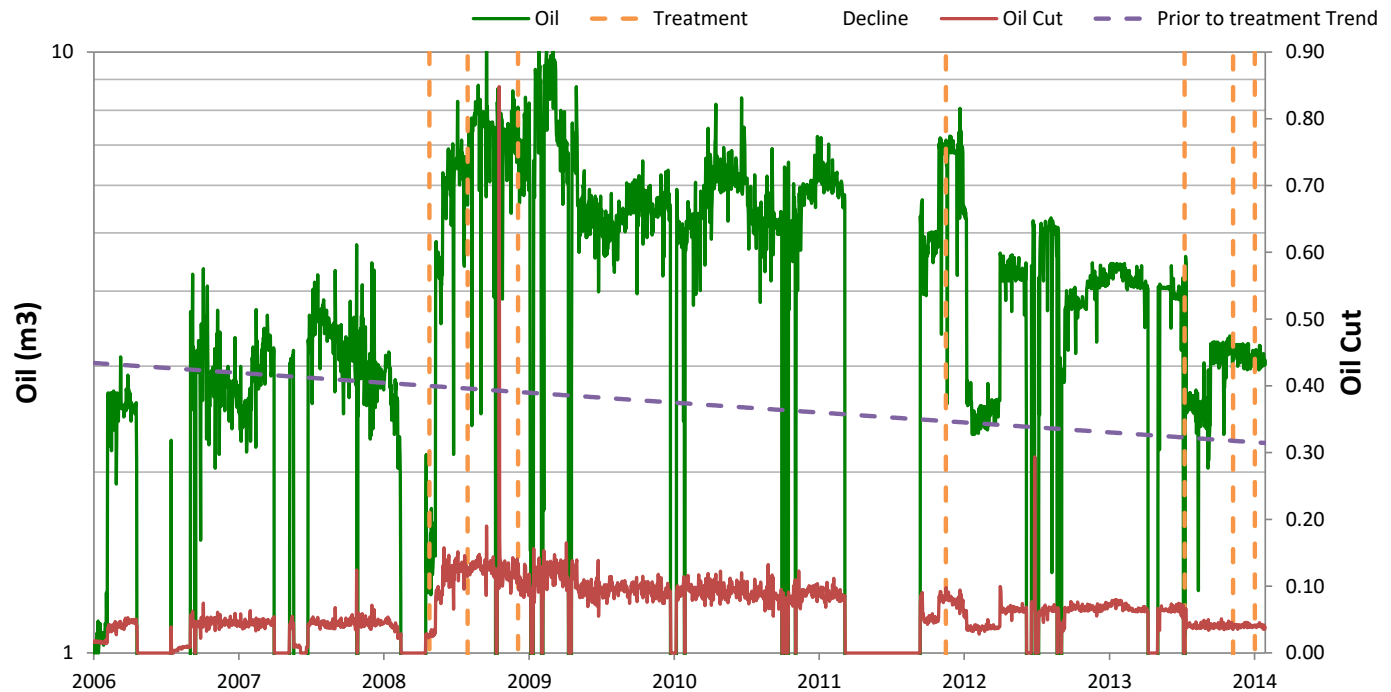
BH TEMP	123°F (51°C).
API Gravity	33°
Viscosity	-
Permeability	20-100 md
TDS	39,000 mg/L





Field 7 - Saskatchewan, Canada

**Production
up for Five
Years Above
Baseline**



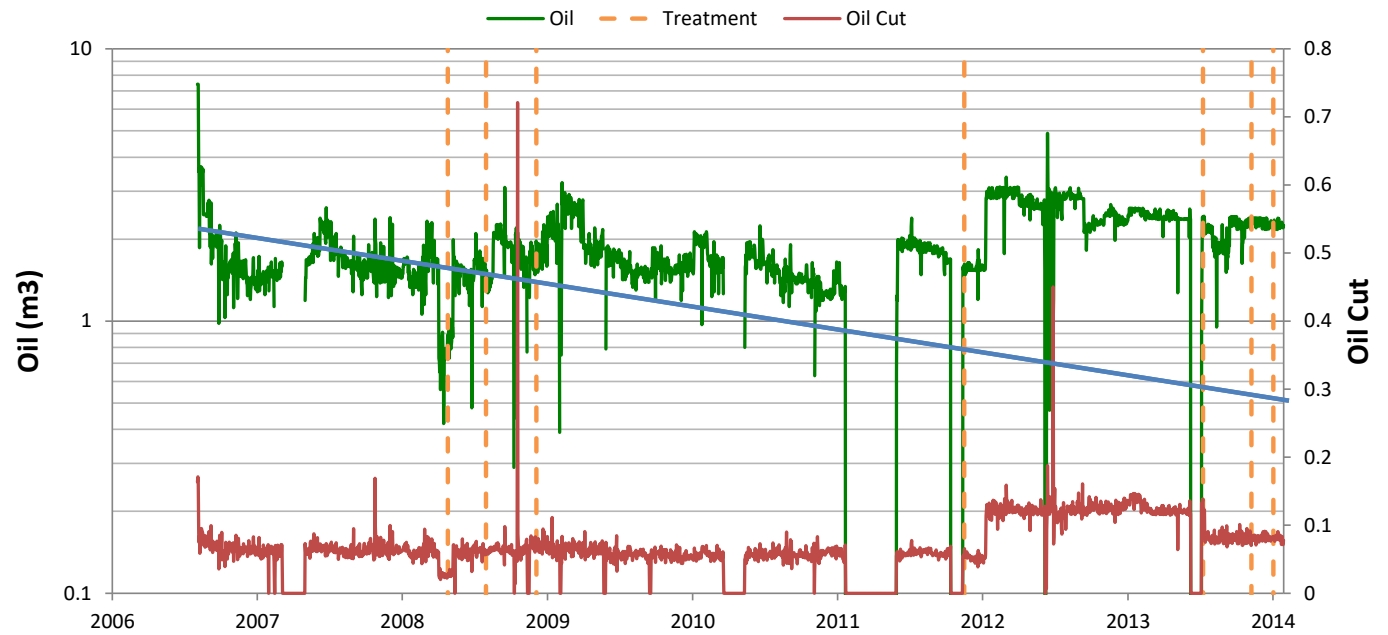
BH TEMP	117°F (47°C).
API Gravity	24°
Viscosity	14.3cp
Permeability	50-500md
TDS	10,025 mg/L



**Five Years Above Baseline
with only 7 applications**

BH TEMP	117°F (47°C).
API Gravity	24°
Viscosity	894cp
Permeability	520md
TDS	17,295 mg/L

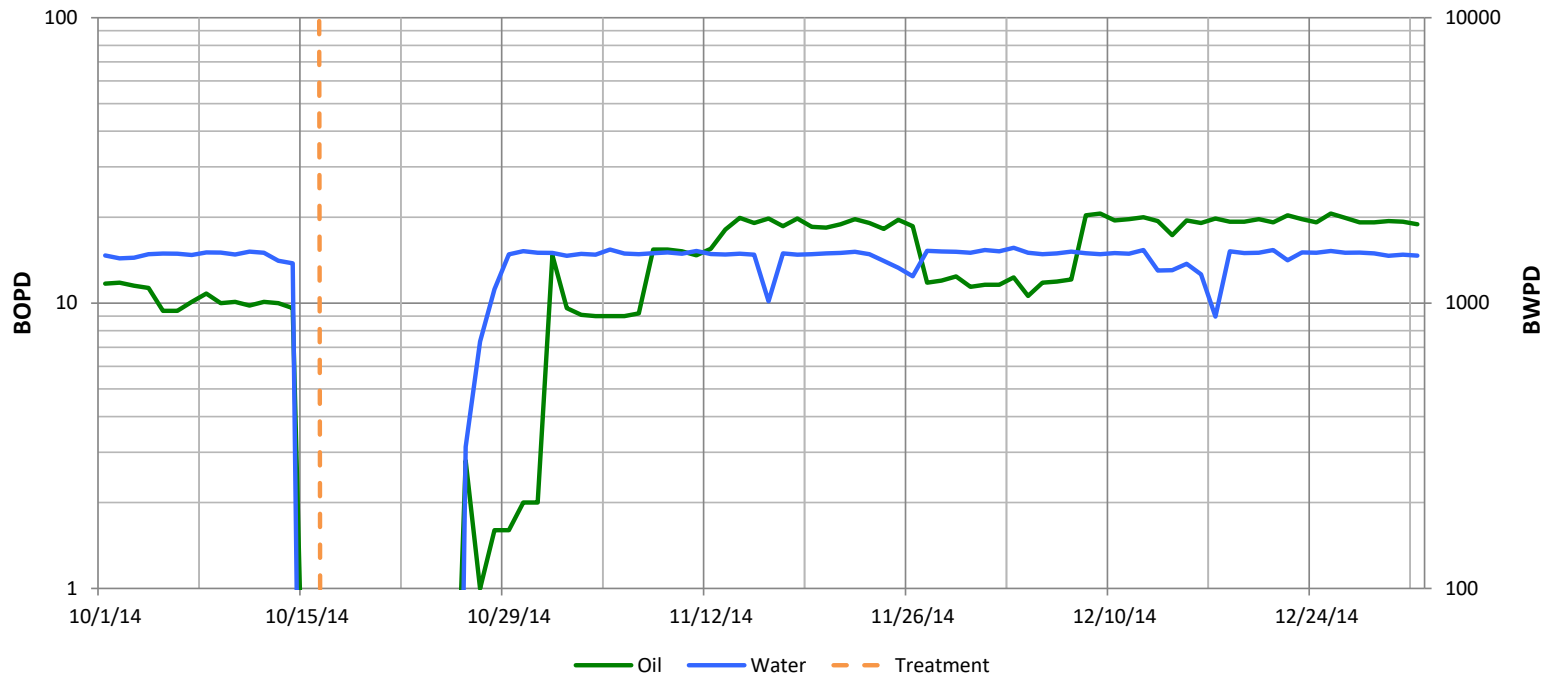
Field 7 New well - Saskatchewan, Canada





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Field 48 – Alberta, Canada



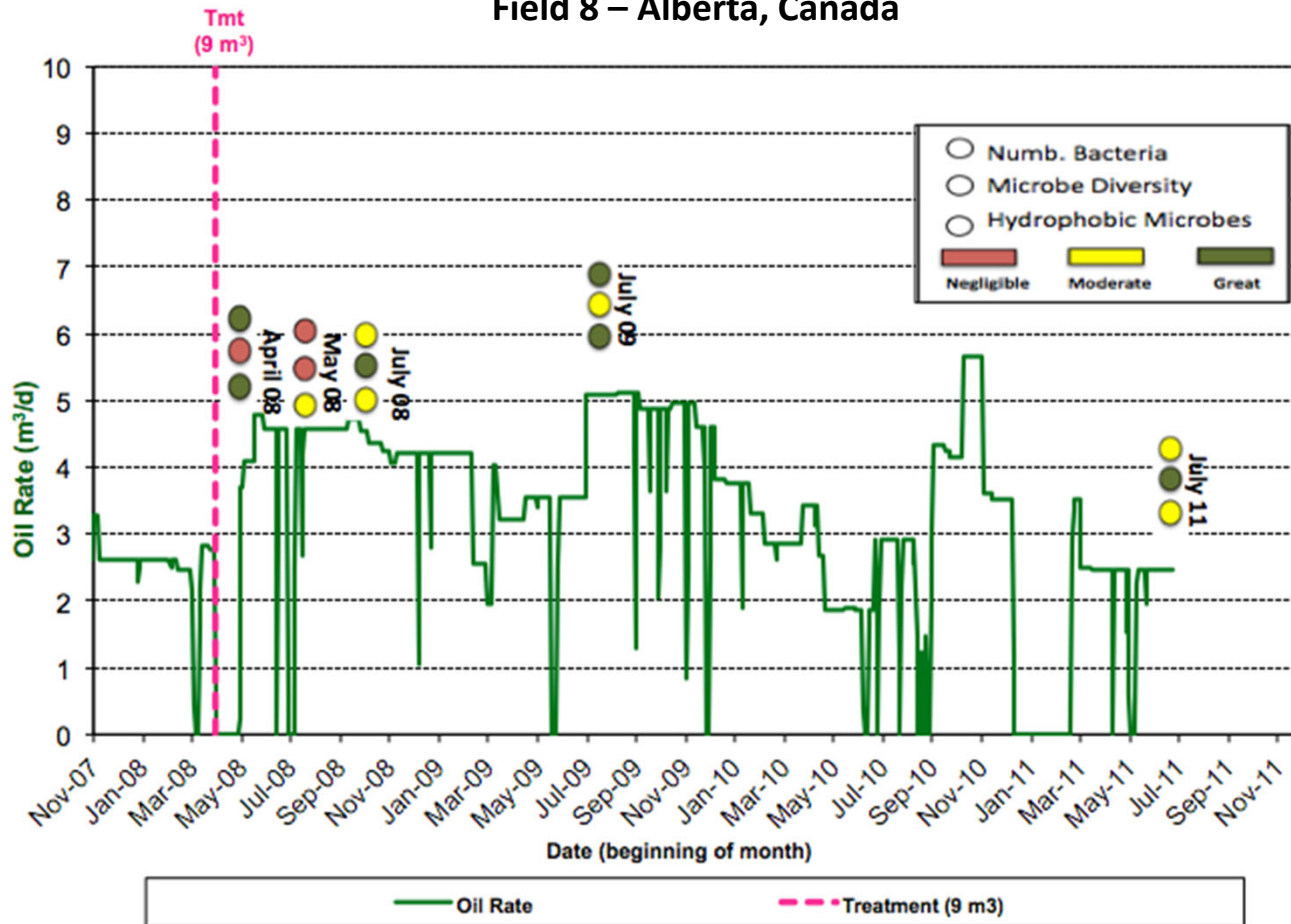
BH TEMP	89°F (32°C).
API Gravity	17°
Viscosity	14.3cp
Permeability	50-500md
TDS	10,025 mg/L



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Nineteen Months
Improvement
from Single
Treatment,
Production at
same level three
years Later

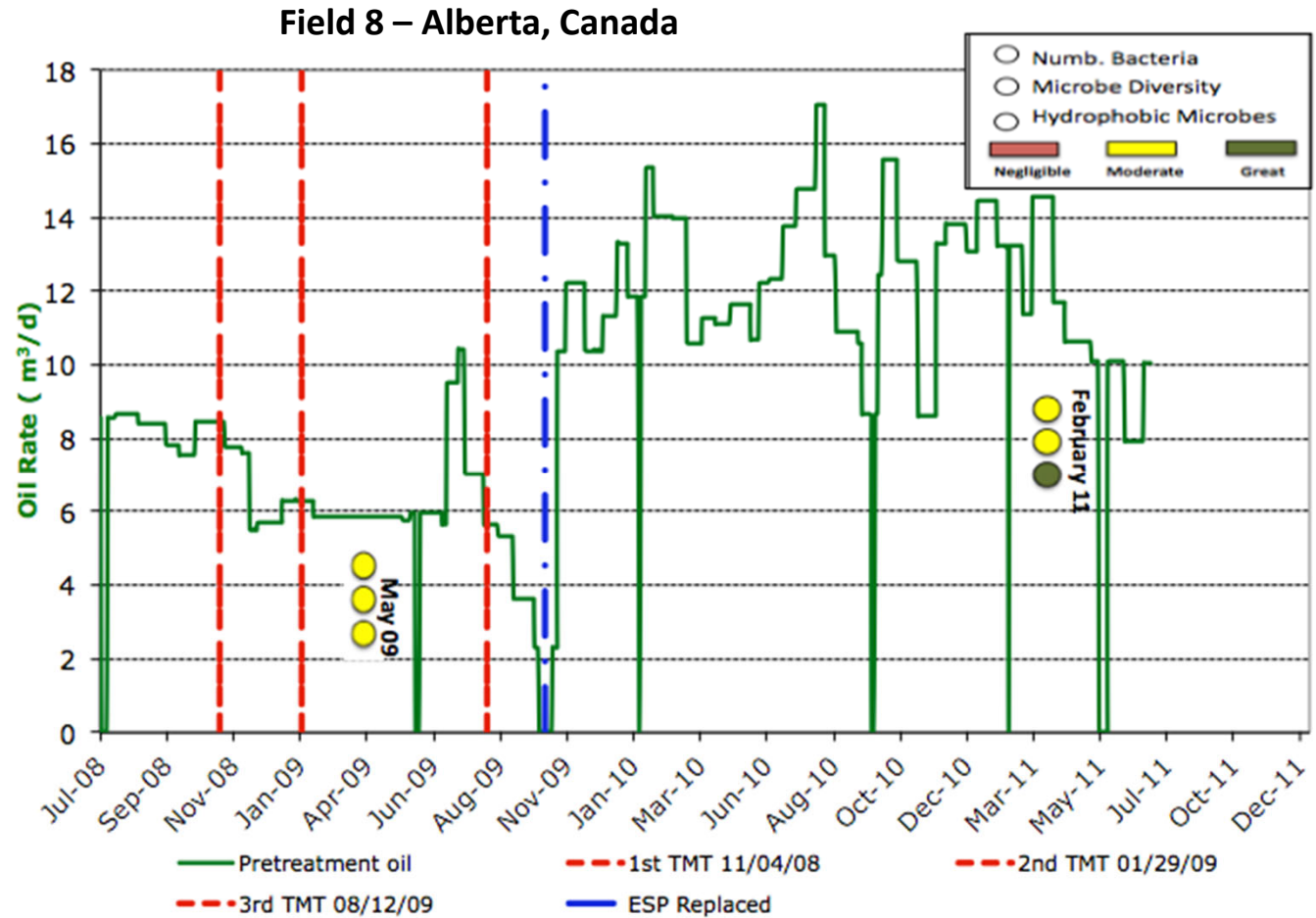
Field 8 – Alberta, Canada





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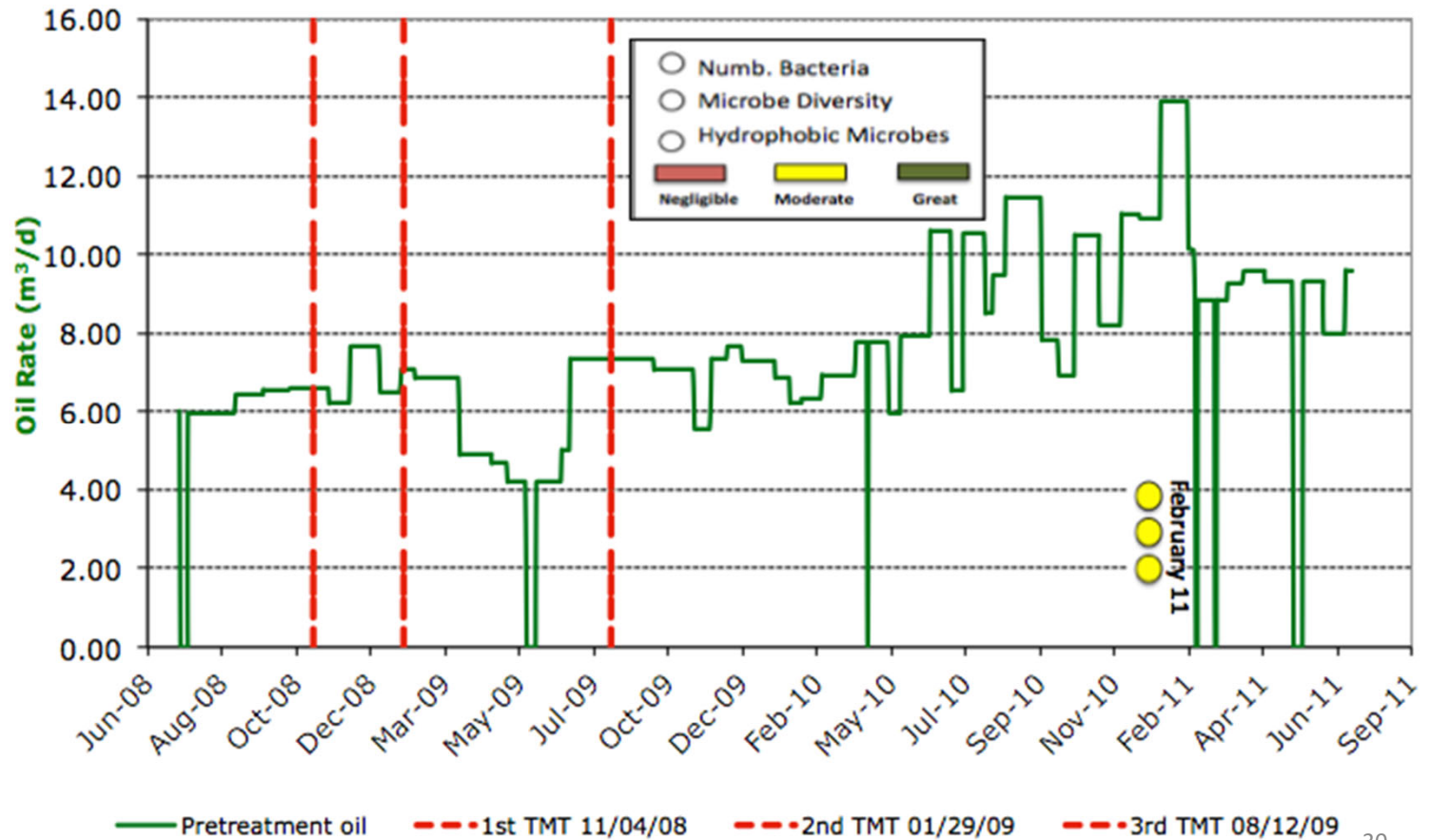
Production up 21 months
after last treatment





Field 8 – Alberta, Canada

Production up 24 months
after last application

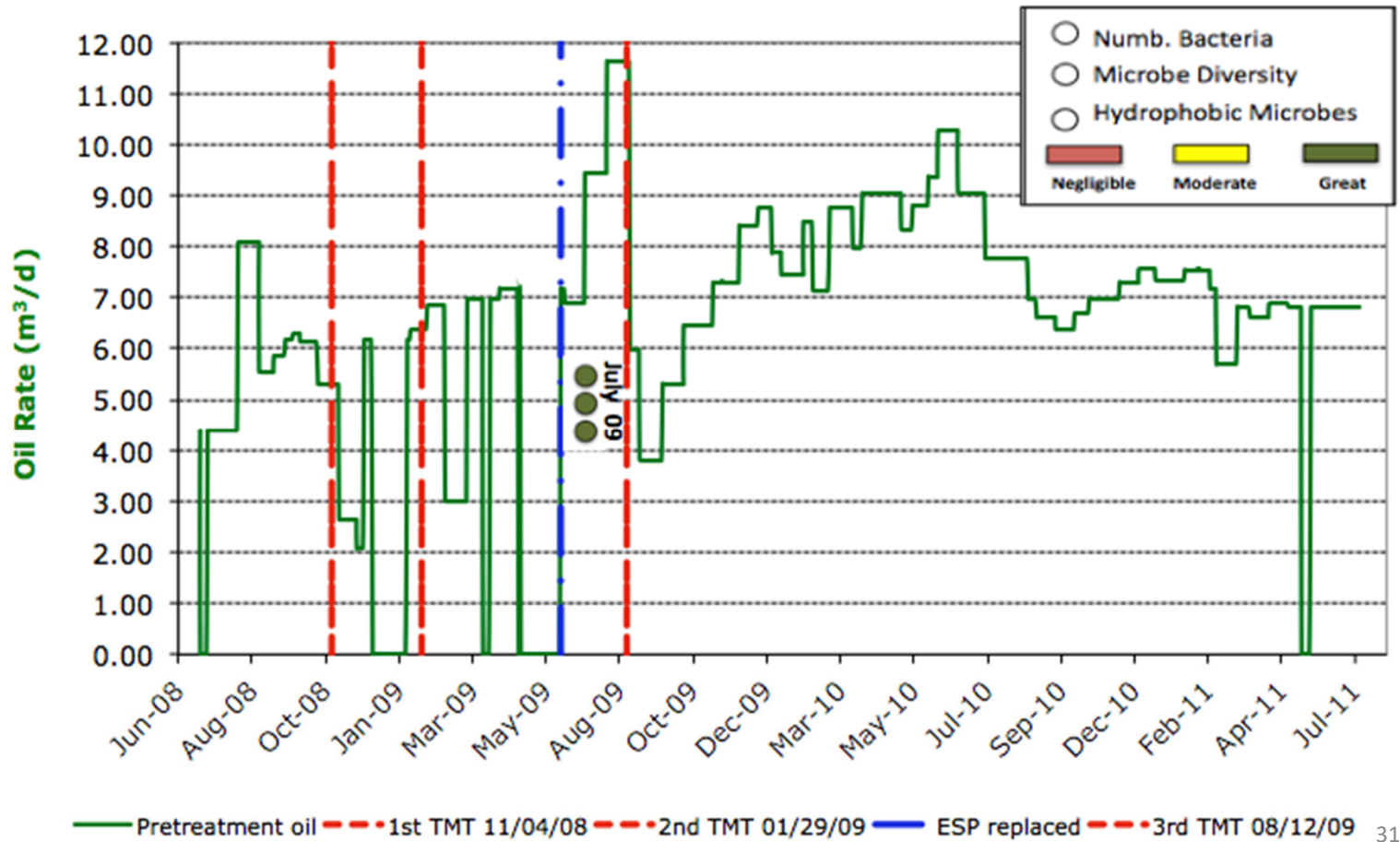




TITAN Oil Recovery, Inc.

Three Years Later Oil
Production Higher

Field 8 – Alberta, Canada



150% production Increase
lasting over two years

