British Journal of Multidisciplinary and Advanced Studies 6(2),1-13, 2025

Engineering

Print ISSN: 2517-276X

Online ISSN: 2517-2778

https://bjmas.org/index.php/bjmas/index

Published by the European Centre for Research Training and Development UK

A Multifunctional Well-Placement in an Oil Rim Reservoir

[1]John Victory Christopher, [2]Uti Lawrence Oghenebrume, [2]Amatoru Bourdillon

[1]Department of Petroleum Engineering Federal University of Petroleum Resources Effurun, Delta State

[2]Department of Petroleum Engineering and Geosciences, Petroleum Training Institute, Effurun, Nigeria.

doi: https://doi.org/10.37745/bjmas.2022.04251 Published March 06, 2025

Citation: Christopher J.V., Oghenebrume U.L., and Bourdillon A. (2025) A Multifunctional Well-Placement in an Oil Rim Reservoir, *British Journal of Multidisciplinary and Advanced Studies*, 6(2),1-13

Abstract: *Enhancing hydrocarbon production and optimizing recovery at the lowest possible cost are the objectives of an oil field development research. Coning issues, gas smeared, and oil lost into the gas cap are always linked to optimizing oil production from oil rim reservoirs with an underlying aquifer and an overlaying gas cap. These issues will lower the oil recovery factor. Oil rim reserves are viewed as marginal by the majority of oil firms. A model with a horizontal and multilateral well in an oil rim reservoir is simulated using the Schlumberger Eclipse 100 Black oil simulator, with the horizontal well serving as the base-case. Sensitivity analysis, cost evaluation of the advantages of the multilateral well over the horizontal well, and the impact of standoff from such reservoirs were also investigated. The analysis of the simulation results, cost analysis, and sensitivity analysis revealed that the horizontal well produced 132,287 STB, a higher field oil production rate, and a good amount of profit than the multilateral well, which presented an increased oil production total of 134,135 STB. With 132,287 STB, the horizontal well's standoff resulted in the highest oil recovery production because to its tiny size. However, when the standoff was severe and the laterals were widely spaced, more oil—134,135 STB—was collected from the multilateral well. According to the aforementioned findings, multilateral wells can be utilized in an oil rim reservoir to improve oil recovery as opposed to traditional techniques, which do not yield the best output and render the oil rim reservoir marginal.*

Keywords: Reservoir, oil rim, recovery, cost, hydrocarbon

INTRODUCTION

Reservoirs with a thin oil thickness of 15 to 25 feet are known as oil rim reservoirs. Despite their thin thickness, these reservoirs have a broad lateral extent, which contributes to their substantial oil volume. Since it has been difficult to produce this oil from oil rim reservoirs over the years, recovery is typically quite low. The phenomena of low oil recovery in oil rim reservoirs involves the flow of water and gas into a producing well's well bore. This is due to the characteristics of gas and the difference between the densities of water and oil. Previous development strategies for these reservoirs included the placement of horizontal and deviated wells to maximize production. However, given the current demand for a steady supply of gas for the Nigerian gas market, these reservoirs can be developed using the gas blow down mechanism to both maximize oil production and meet the target need for gas supply. Plans for the entire hydrocarbon maturation of oil rim reservoirs can also be regarded as the gas blowdown method. There are many unknowns and severe repercussions if a choice goes wrong, making the petroleum industry a risky and difficult business. Therefore, it is necessary to combine and completely comprehend the seismic data, specific reservoir parameters, and well behavior in order to optimize a field to its fullest potential. If one does not have a thorough grasp of the behavior of the wells in that field, it is implied that a field development study will not produce good optimization plans. The contacts in these reservoirs are already established before production begins, therefore methods for drilling wells there include simulating the reservoirs to determine the current contact. This aids in well placement and forecasts the hydrocarbons that may be expected from these reservoirs. Over the past few decades, development plans for oil and gas reservoirs have been suggested based on the results of a geologic model and a seismic interpretation. To get the best possible recovery from the field, the techniques alone are insufficient. Understanding the behavior of the well that went through or finished the reservoirs is the most crucial aspect of a simulation research. Several scholar have examined and analyzed the development of oil rim reservoirs to achieve optimal recovery(Olugbenga and Peacock, (2009); Sascha, and Marc, (2002); Fajhan, et al., (2006); Kabir , et al., (2007); Obidike, et al., (2019) utilizing various development methodologies that have been put out and put into practice.

The outcomes of these tactics differ for different reservoirs based on the size of the gas cap, the location of the horizontal well, and the current reservoir conditions. Similarly, accelerated hydrocarbon production and maximum oil recovery at low cost are the goals of any oil field development research. In the Niger Delta sedimentary basin, oil rim reservoirs with a large gas cap are typical. Although their oil resources are widely dispersed and their production processes are complex, these reservoirs nevertheless hold significant amounts of oil in situ (Yetunde, 2019). Oil rim reservoirs typically feature oil columns that range in thickness from less than 30 to 90 feet. These reservoirs are typically overlaid by gas and/or underlain by water. The reservoir's form might be sloping with edge water or dome-shaped, with the oil zone positioned between the gas cap and bottom water (Marcelle-De Silva and Dawe, 2010). Numerous approaches, including horizontal and multilateral wells, have been employed to generate an oil rim covered by a sizable gas cap. The most conventional type of wells are vertical wells, which are drilled at a zero inclination angle and intersect the reservoir bedding plane at right angles. However, because of the small area of reservoir contact and the high pressure drop associated with vertical wells, these wells are not suitable for use in oil rim reservoirs. Additionally, they make the well extremely vulnerable to coning, which is detrimental to the recovery of the hydrocarbons that are to be produced. Significant technological advancements have made it possible to drill horizontally in order to further improve the performance of these vertical wells, especially in regions where vertical wells have not proven to be particularly effective (Masoudi, et al., 2013). A horizontal well is defined as one that is drilled with a course that is roughly 90 degrees from the bedding plane of the reservoir. Multiple horizontal or nearly horizontal lateral wells drilled from a single wellbore and connected back to the main bore constitute a multilateral well, which is an advanced type of horizontal well (Akinwole, 2012). This type of well is typically distinguished by its building and geometry. Multilateral completions—separate drain holes or branches—drilled from a single primary borehole are becoming more and more important to operating businesses in the petroleum sector as they strive for optimum reserve recovery, cost reduction, and optimal production (Yeten, 2003). Basic types of multilateral wells have existed since the 1950s, according to studies, but early drilling techniques and finishing tools were only appropriate for a limited number of uses. Throughout the 1990s, advancements in well-construction methods made it possible for operators to drill and finish more wells with several lateral branches. Multilateral wells are used by operators to access bypassed reserves and target many reservoirs using a single main wellbore, in this example the oil rim reservoir. According to Almutairi et al. (2007), multilateral technology frequently offers the only cost-effective way to produce from oil rim reservoirs. Coning is a problem in oil rim reservoirs that are extremely sensitive when the oil rim is sandwiched between a gas cap and bottom water.

Ultra-thin oil rim reservoirs with pay thickness of less than 30 ftas described by Refs. [33,34] still hold considerable reserves if best production optimization practices are put in place

. The research aimed at providing a means of accessing reservoirs with oil column thickness having low porosity in order to provide optimum production from such reservoirs. The objectives of this study include:

i. To simulate the placement of a multilateral well in a thin oil rim reservoir.
ii. To evaluate the production of oil from a thin oil rim reservoir with multilateral well and comparing to the horizontal well producing from that same reservoir.
iii. To evaluate the effect of standoff on oil recovery from the reservoir.
iv. To evaluate cost benefits of multilateral well over horizontal well in an oil rim reservoir.
v. To evaluate the effect of standoff on oil recovery from the reservoir.
vi. To evaluate cost benefits of multilateral well over horizontal well in an oil rim reservoir.
vii. To perform a sensitivity analysis on the effect of wellbore diameter on oil recovery and effect of oil price on profits.

Print ISSN: 2517-276X
Online ISSN: 2517-2778
https://bjmas.org/index.php/bjmas/index
Published by the European Centre for Research Training and Development UK

RELATED LITERATURE ON OIL RIM RESERVOIR

Sascha and Marc (2002) found that in order to maximize the development of hydrocarbon (gas and oil) resources, the gas cap and oil rim are produced concurrently from the beginning of production. This can be done at a lower cost by using a single well string, and it works particularly well for reservoirs with an active water drive system. Putting a horizontal well near the gas-oil contact with relatively large tubing size can also increase oil recovery. Cosmos and Fatoke (2004) looked at three locations—one-third, center, and two-thirds from the GOC—and discovered that, due to higher gas production, the landing near the GOC (one-third position) produced the least amount of oil compared to the center and two-third positions. The two-thirds position generated more oil than the one-third position while reducing more water. The possibility for efficient oil recovery from thin oil column reservoirs that clever completions offer was examined by Fajhan et al. (2006). The ICV control technique maximizes oil output by postponing gas and water breakthrough rather than controlling its production. A narrow oil rim with astute completions will reduce coning, cusping, and drawdown in a horizontal well. This strategy was employed, and it is projected that oil production will increase by another 38% overall. According to Fajhan et al. (2007), even though it can be challenging to place horizontal wells in a thin-oil column, additional oil recovery is still possible. However, a significant amount of oil is still abandoned. Oil rim recovery is maximized by placing the horizontal well either exactly above or below the gas-oil interface. Close above the GOC is a horizontal well that is used to track oil migration and loss into the gas cap. This strategy has a high off-take of gas rates and is recommended when gas monetization is not an issue. In situations where gas production is not needed, the horizontal well should be placed directly below the GOC. Following the terms of the contract and maintaining the gas supply were the main concerns of Olugbenga and Peacock (2009). An effort is made to produce the gas from oil rim reserves by producing more oil volume during the gas production process. Consequently, it is necessary to consider the development of these oil rims as a part of the total maturation of hydrocarbons. According to Obidike et al. (2019), in order to economically develop the oil rim, existing wells are diverted at a severely skewed angle to target by-passed oil in the field. A horizontal well is believed to be more efficient at draining oil from reservoirs than a vertical well because it has a bigger contact area (drainage area) with the oil column. The water breakthrough time is also delayed since the horizontal well sees less pressure decline than the vertical well, even with the same start-up rate. According to one study by Ogolo et al. (2019), the maximum oil recovery was 44% from gas injection above the oil-water interface, whereas other horizontal well placement instances had 29% and water injection cases had 33%. It is evident that recovery factors offered by thin oil rim development projects around the world differ widely, from as low as 3% to as high as 40% or more. The expected progress has been discontinuous in a number of cases due to poor economic conditions and a poor recovery. Stakeholders are particularly interested in a sign of the best recovery from such a development (Obidike et al., 2019). One of the primary production problems in the development of oil rim reservoirs is early water and gas breakthrough, which

Print ISSN: 2517-276X
Online ISSN: 2517-2778
https://bjmas.org/index.php/bjmas/index
Published by the European Centre for Research Training and Development UK

drastically reduces the production of oil, which is the desired phase. The expected recovery has not been realized, despite the use of horizontal well placement to improve recovery from associated gas reservoirs. Studies show that building oil rim reservoirs via the gas blast technique is more effective (Uwaga and Lawal, 2006). The study employed a gas blowdown method to enhance oil recovery from a developed oil rim reservoir (CEFA) in the Niger Delta of Nigeria.

METHODOLOGY

Data Acquisition

The oil rim reservoir's horizontal and multilateral well placement was modeled using the Schlumberger Eclipse 100 black oil simulator. For the model of the horizontal and multilateral well scenarios, the HORZWELL.DATA file from the Eclipse 100 data section was altered and utilized as input.

Reservoir Model Description

The horizontal well scenario and the multilateral well scenario were both based on the same reservoir model. The base case was the horizontal well. Twenty cells ran in the x direction, nine in the y direction, and forty-five in the z direction, making up the model. Thus, there were 8100 cells in the model overall. The grid block's top faces, or TOPS, were 7000 feet deep. For the x, y, and z directions, the grid sizes were 40, 18, and 90 feet, respectively. The reservoir model's horizontal and vertical permeabilities were 300 mD and 30 mD, respectively, and its porosity was low at 0.2. Gas, water, and oil have densities of 0.0702 Ibm/ft3, 62.4 Ibm/ft3, and 45 Ibm/ft3, respectively. The reservoir's gas-oil and water-oil contacts were situated at 7020 and 7070 feet, respectively. This suggests that the oil column in the reservoir model is 50 feet thick. Between layers 4 and 6, the reservoir's oil zone was located. The producer well was positioned 7050 feet below the surface. 4 x 10-6 psia-1 was the compressibility of the rock see Table 1 to 3.

Table 1: Fluid property and Initial description data

Pressure (Psia)	Gas viscosity (cp)	Solution GOR, Rs(MScf/Stb)	Oil FVF (RB/STB)	Oil viscosity (cp)
1214.70	0.01240	0.13700	1.17200	1.97000
1414.70	0.01250	0.19500	1.20000	1.55600
1614.70	0.01280	0.24100	1.22100	1.39700
1814.70	0.01300	0.28800	1.24200	1.28000
2214.70	0.01390	0.37500	1.27800	1.09500
2614.70	0.01480	0.46500	1.32000	0.96700
3014.70	0.01610	0.55800	1.36000	0.84800
3414.70	0.01730	0.66100	1.40200	0.76200
3814.70	0.01870	0.77000	1.44700	0.69100

Print ISSN: 2517-276X
Online ISSN: 2517-2778
https://bjmas.org/index.php/bjmas/index
Published by the European Centre for Research Training and Development UK

Table 2: Fluid and Rock properties

Sgas	Krg	Pcog	Soil	Krow	Krog	Swat	Krw	Pcow
0.0000	0.0000	0.0000	0.3000	0.0000	0.0000	0.1000	0.0000	20.000
0.0500	0.0000	0.0300	0.3600	0.0320	0.0010	0.1600	0.0005	9.0000
0.0900	0.0320	0.1000	0.4200	0.0890	0.0080	0.2200	0.0040	5.0000
0.1800	0.0890	0.3000	0.4800	0.1640	0.0275	0.2800	0.0135	4.1000
0.2700	0.1640	0.6000	0.5400	0.2530	0.0640	0.3400	0.0320	3.3000
0.3600	0.2530	1.0000	0.6000	0.3540	0.1250	0.4000	0.0625	2.6000
0.4500	0.3540	1.5000	0.6600	0.4650	0.2160	0.4600	0.1080	2.0000
0.5400	0.4650	2.1000	0.7200	0.5860	0.3430	0.5200	0.1720	1.5000
0.6300	0.5860	2.8000	0.7800	0.7160	0.5120	0.5800	0.2560	1.1000
0.7200	0.7160	3.6000	0.8400	0.8540	0.7290	0.6400	0.3650	0.8000
0.8100	0.8540	4.5000	0.9000	1.0000	1.0000	0.7000	0.5000	0.6000
0.9000	1.0000	5.5000				0.8000	0.6670	0.3000
						0.9000	0.8330	0.1000
						1.0000	1.0000	0.0000

The RUNSPEC to SUMMARY for the horizontal and multilateral scenarios was same. In the SCHEDULE section, the changes were done for both instances. The opposing multilateral well, which was stacked dual, was the multilateral kind that was employed. The well segments and all connections were defined by the WELSEGS input, which was appended to the multilateral input in the SCHEDULE section. Additionally, the COMPSEGS, which was added after the WELSEGS input, described the strata that the well segments are traversing.

Simulation Run

The reservoir model's oil zone contained the horizontal well, which served as the base-case. The horizontal and multilateral wells' vertical sections were positioned at 7020 feet (layer 10) on the x-axis and 7009 feet (layer 5) on the y-axis.To identify the optimal layers with the highest output, the two laterals for the multilateral well were positioned at various depths within the oil rim zone. To determine the ideal placement, the horizontal well section was positioned at various depths within the oil rim zone. Figures 1 and 2, respectively, depict the horizontal and multilateral placement of the reservoir wells. The outcomes were examined and contrasted.

Cost Analysis

The revenue from both wells was compared by multiplying the current oil price by the total amount of oil produced from both wells in order to evaluate the costs of the multilateral and horizontal wells.

Sensitivity Analysis

To determine the impact on oil recovery, a sensitivity analysis was conducted by altering the laterals' positions at various depths, well diameters, and oil prices, as indicated in Table 3.

Print ISSN: 2517-276X
Online ISSN: 2517-2778
https://bjmas.org/index.php/bjmas/index
Published by the European Centre for Research Training and Development UK

The ideal site for the horizontal segment of the horizontal well was determined by placing wells at various depths of 7030, 7040, and 7050 feet in the reservoir model to test the effect of standoff. In order to observe the impact of stand-off on oil recovery from the reservoir, the top lateral of the multilateral well was positioned at a depth of 7030 and 7066 feet, 7040 feet, and 7066 and 7066 feet for both laterals. The results were analyzed and compared with one another. The bottom lateral was left constant.

Table Error! No text of specified style in document.**:** Sensitivity Variations

Variable	**Standard size**	**Increase by 20%**	**Reduce by 20%**
Well Diameter(ft)	1.02	1.224	0.8160
Oil Price($)	63	75.6	50.4

Results and Discussion

In order to maximize oil output, this research presents the outcomes of several changes made to the horizontal and multilateral wells see Fig. 1 to 3. Additionally, studies on sensitivity analysis and cost evaluations are provided.

Model Structure

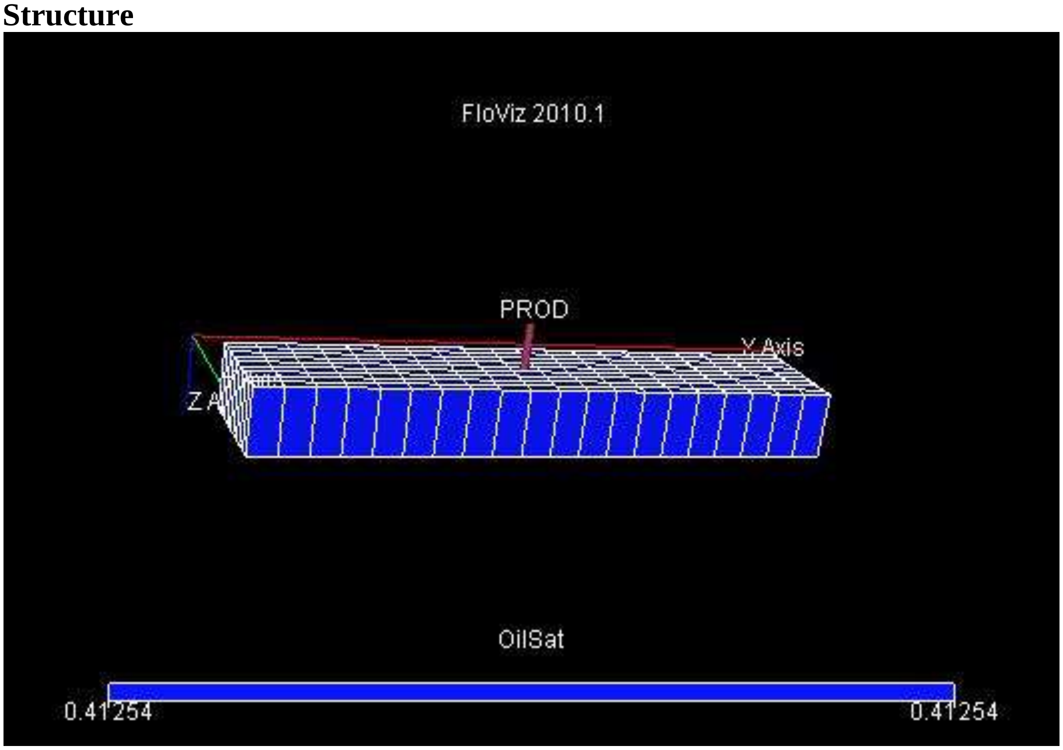

Fig.1: 3D view of the reservoir model

Print ISSN: 2517-276X
Online ISSN: 2517-2778
https://bjmas.org/index.php/bjmas/index
Published by the European Centre for Research Training and Development UK

Well Scenarios

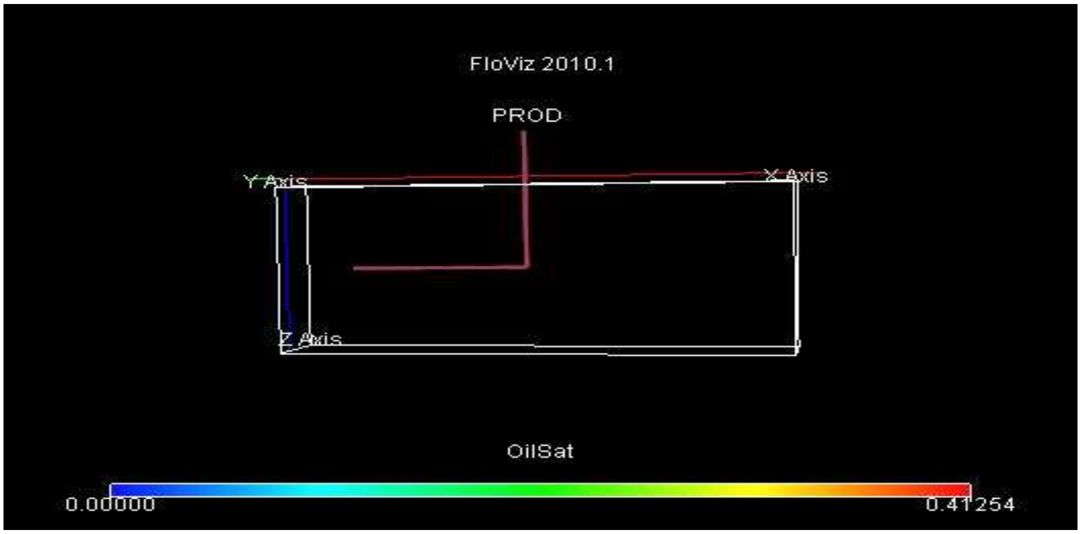

Fig. 2: Horizontal Well in the Oil Rim Reservoir

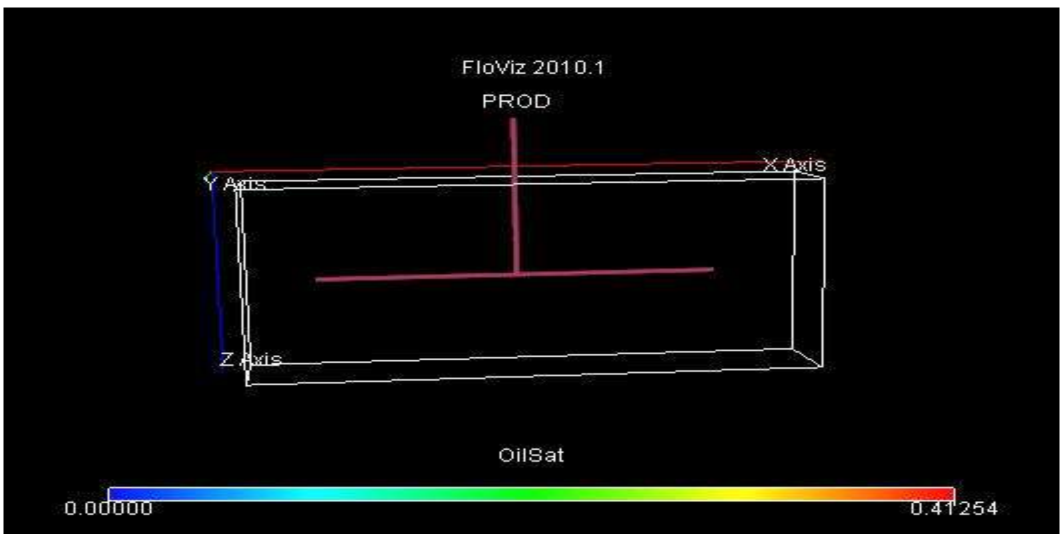

Fig. 3: Multilateral Well in the Oil Rim Reservoir

Following the placement of the horizontal well section at various depths, the optimal lateral site was determined to be 7050 feet, with a total field oil production of 132 MSTB.
With regard to the multilateral, the top lateral at 7030 feet and the bottom lateral at 7066 feet of the reservoir had the best recovery see Fig.4. As a result of the placement, 134 MSTB of field oil

Print ISSN: 2517-276X
Online ISSN: 2517-2778
https://bjmas.org/index.php/bjmas/index
Published by the European Centre for Research Training and Development UK

were produced. An overview of the output produced by executing the data file for the multilateral and horizontal well models

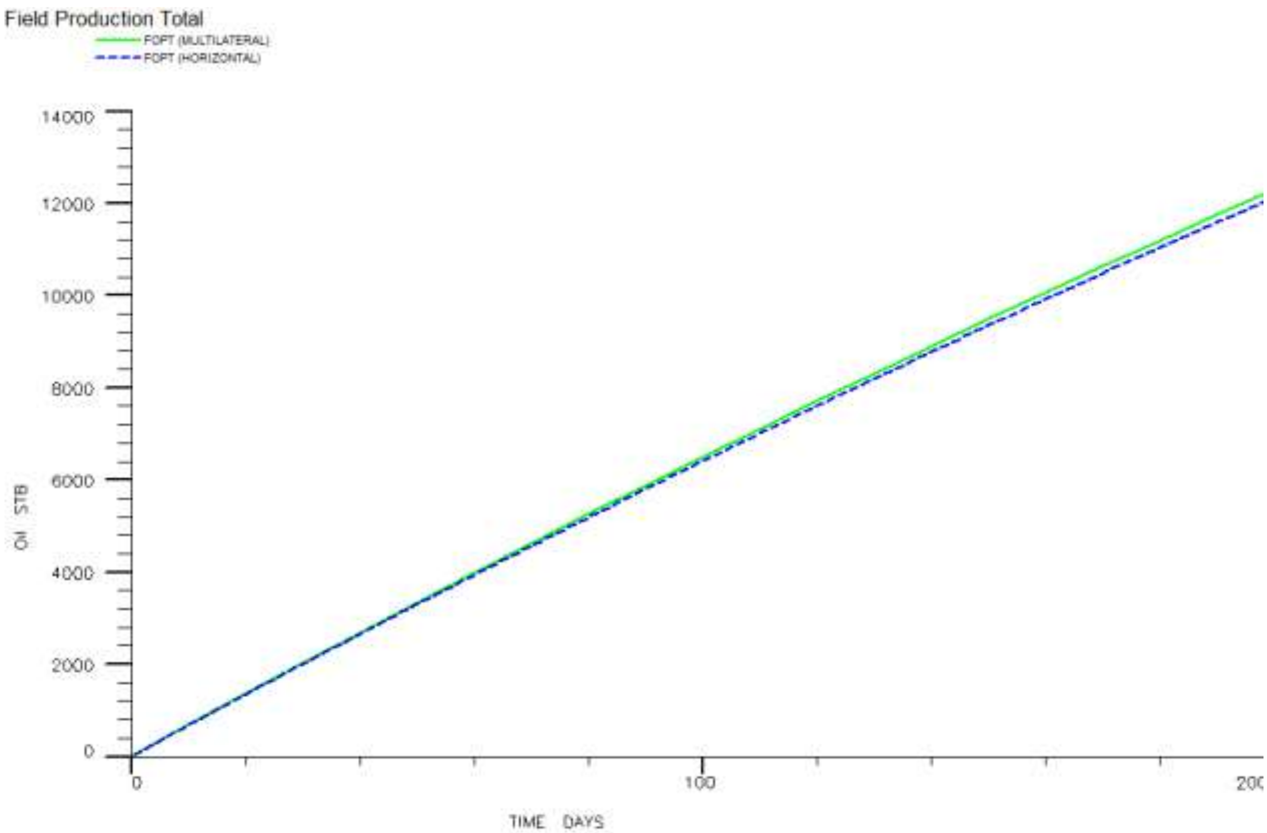

Fig. 4: Field oil production total for both scenarios

Table 5: Findings for both scenarios

Wells	FOPT(STB)
Multilateral	134,135
Horizontal	132,287

In an oil rim reservoir, the multilateral well offsets the high initial costs and hazards associated with multilateral completion by delivering a higher field oil producing total than the horizontal well, as shown by the plots in Fig. 4 and the production data in Table 5.

Print ISSN: 2517-276X
Online ISSN: 2517-2778
https://bjmas.org/index.php/bjmas/index
Published by the European Centre for Research Training and Development UK

Cost Analysis

Table 5: Result for Revenue from both wells

Well type	Multilateral	Horizontal
Revenue ($)	$8,450,505	$8,334,081

From Table 5, it is observed that the profit gained from the multilateral well is $116,424 higher than that of the horizontal well in the reservoir.

Sensitivity Analysis

Effect of Standoff

Horizontal Well Scenario

Table 6: Results for Horizontal Standoff comparison

Depth(ft)	7030	7040	7050
FOPT (STB)	131,765	132,243	132,287
FGPT (SCF)	4,623,556	4,623,126	4,623,072
FWPT (STB)	142.335	142,372	142,376

Based on Table 6, above, it can be inferred that the best optimum production is presented by placing the lateral at 7040 feet because of the coning effect. This means that a well's production increases with proximity to the water-oil contact, but it also produces more water, which can cause early water coning. Conversely, a well's recovery decreases with distance from the water-oil contact, but it also produces more gas, which can cause early gas coning.

Multilateral Well Scenario

Table 7: Results of Multilateral Standoff comparison

Depth(ft)	7030/7066	7040/7066	7066/7066
FOPT(MSTB)	134,135	133,801	131,531
FGPT(MSCF)	4,621,157	4,621,531	4,624,083
FWPT(STB)	142,516	142,481	142,284

According to Table 7, the laterals placed at 7030 and 7066 feet produced the most, but they also produced the most gas and water, which will cause early gas and water coning. Thus, the best alternative is to locate the laterals at 7066 feet, opposite one another, and near the water-oil contact at both laterals.

British Journal of Multidisciplinary and Advanced Studies 6(2),1-13, 2025
Engineering
Print ISSN: 2517-276X
Online ISSN: 2517-2778
https://bjmas.org/index.php/bjmas/index
Published by the European Centre for Research Training and Development UK

Effect of variable Well Diameter on Oil Recovery

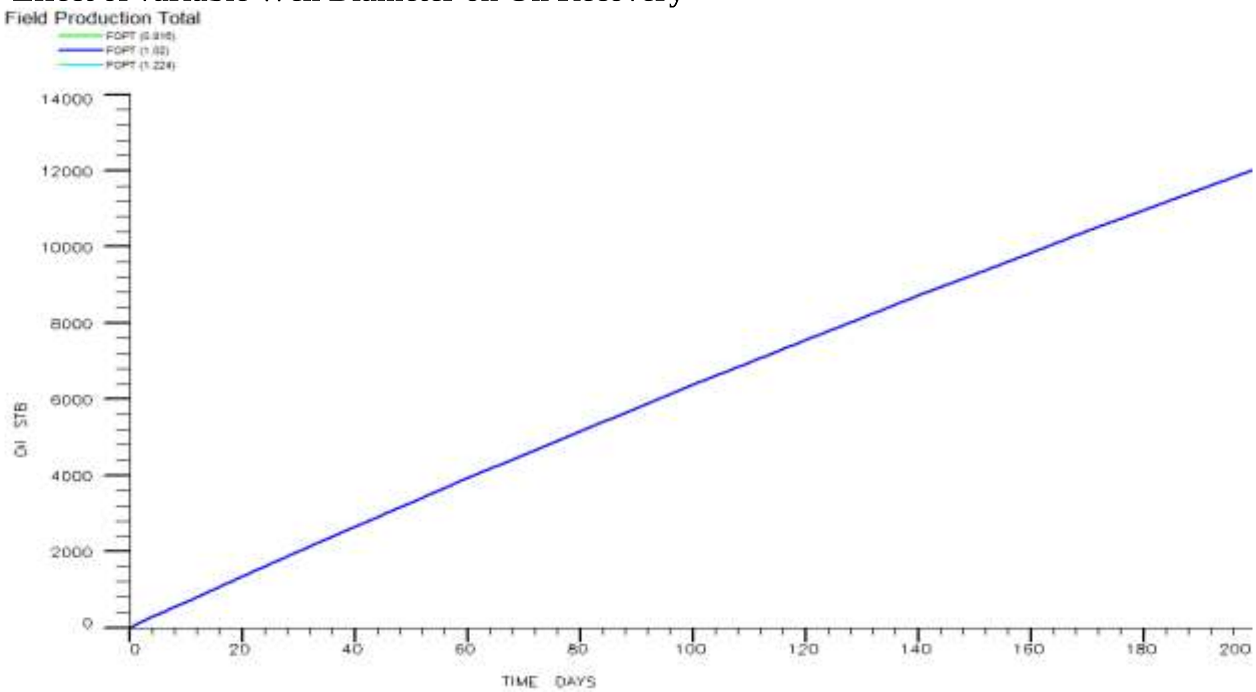

Fig. 5: Plot of Sensitivity Analysis of varying Well Diameter

Table 8: Result for varying Well Diameter

Variable	Standard size	Increase by 20%	Reduce by 20%
Well diameter (ft)	1.02	1.224	0.8160
FOPT(STB)	131531.1129	131531.1133	131531.1127

As seen in Fig. 5 and Table 8, as long as the diameter difference stays within the allowed range (± 20%), the impact of liner size on oil production is minimal. However, the production volume in the oil rim reservoir decreases with increasing well diameter.

Effect of Varying Oil Price on Revenue

Table **Error! No text of specified style in document.**.3 Sensitivity analysis result for varying Oil Prices

Variable	Standard size	Increase by 20%	Reduce by20%
Oil Price ($)	63	75.6	50.4
Revenue ($)	$ 8,450,505	$10,140,606	$6,760,404

According to Table 4.6 above, the reservoir generates more money when the price of oil is higher and less revenue when the price of oil is lower. As a result, revenue is greatly impacted by the price of oil.

Print ISSN: 2517-276X
Online ISSN: 2517-2778
https://bjmas.org/index.php/bjmas/index
Published by the European Centre for Research Training and Development UK

CONCLUSION AND RECOMMENDATION

Conclusion

Adopting multilateral wells on new or existing hydrocarbon platforms—in this case, the oil rim reservoir—is said to boost production output. The multilateral well's primary obstacles have been the initial completion, dependability, and risk considerations.
Using sensitivity analysis, cost analysis, and production simulations to put a multilateral well in a thin oil rim reservoir, the following promising outcomes were obtained:

i. Considerable The multilateral well's effective placement resulted in a production rise. The field oil production total of 134 MSTB, which was higher than that of the horizontal well, was used to infer these findings.

ii. ii. Examining the impact of standoff from the reservoir, it was found that for a large gas cap reservoir, the oil recovery is higher but the water production leads to early water coning when the distance between the laterals and the water-oil contact is small. For a multilateral well, the highest production was obtained when the top lateral was farther from the bottom lateral but it has the maximum gas and water production that will lead to early gas and water coning. Consequently, the best alternative is to position the laterals across from one another and near the water-oil contact at both laterals.

iii. The multilateral well turned out to be more economically feasible when the earnings from the two wells were compared.

iv. The profit was significantly impacted by sensitivity analysis on a number of variables, including a decrease and an increase in the price of oil. Additionally, if the fluctuation was within the range of ±20%, the variations in well diameter were insignificant.

v. Well design has a significant impact on productivity in oil rim reservoirs.

Recommendation

This model is a homogeneous model. As a recommendation, this study should continue with the heterogeneous reservoir model.

REFERENCES

Almutairi, F., Davies, D. and Singh, S. (2007). Enhancing Production fromThin Oil Column Reservoirs Using Intelligent Completions. Paper presented at the Society of Petroleum Engineers Asia Pacific Oil and Gas Conference and Exhibition, Jakarta, 30 October–1 November, 2007.

Cosmos C., Fatoke O., (2004). Challenges of Gas Development: Soku Field Oil Rim Reservoirs", SPE 88894.

Fajhan H. A., David R. D., Shamrendra S.(2006):Enhancing Production from Thin Oil Column Reservoirs Using Intelligent Completions‖ SPE Paper 110207-MS Presented at the Asia Pacific Oil and Gas Conference and Exhibition, Jakarta, Indonesia Asia Pacific

Kabir C.S., Agamini M., Holguin R.A., (2007). Production Strategy for Thin Oil columns in saturated reservoirs", SPE 89755.

Marcelle-De Silva, J., and Dawe, R. (2010). The Challenge of ProducingThin Oil Rims in Trinidad. The West Indian Journal of Engineering, Vol. 32, Nos. 1&2,pp 36-41.

Masoudi, R., Karkooti, H. and Mohamad, B. (2013). How to Get the Most Out of Your Oil Rim Reservoirs.Paper presented at the International Petroleum Technology Conference, Beijing, China, 26-28 March, 2013.

Obidike, P.,Onyekonwu, M., Ubani, C.E.,(2019). Exploitation of Thin Oil Rim With Large Gas Cap, a Critical Review‖, SPE Paper198724-MS Presented at SPE Nigeria Annual International Conference And Exhibition, Lagos, Nigeria. Oluwasanmi Olabode*, Pelumi Adewunmi, Odera Uzodinma, Gideon Famurewa, Princess Ogba, Chukwuemeka Amah (2022) Simulation studies on optimizing oil productivity in oil rim reservoirs under gas cap blow down production strategy.

Obidike, P.,Onyekonwu, M.,and Ubani, C.E.,(2019): ―Horizontal well Standoff Performance and Exploitation of Thin Rim‖, SPE- 198725- MS.

Olugbenga, O., Peacock, A., (2009). Reservoir with Large Gas Cap for Oil Rim Development‖, SPE Paper 128603-MS Presented at the Nigeria Annual International Conference and Exhibition, Abuja, Nigeria.

Ogolo, N., Molokwu v., Onyekonwu M. (2019). Proposed Technique for Improved Oil Recovery from Thin Oil Rim Reservoirs with strong aquifer and large gas caps", SPE-189126MS.

Sascha, V. P., Marc, N.(2002). Concurrent Oil and Gas Development Wells: A Smart Well Solution to Thin Oil rim Presence in Gas Reservoirs‖, IPTC Paper Presented at the International Petroleum Technology Conference, Kuala Lumpur, Malaysia, IPTC-12344-MS.

Uwaga A., Lawal K., (2006). Concurrent Gas cap and oil rim production: The swing gas option", SPE 105985.

Yeten, B. (2003). Optimum Deployment of Nonconventional Wells. University of Stanford, USA.

Yetunde, A., Akeem, A. and Ogbe, A. (2019). Surrogate modelling approach: A solution to oil rim production optimization. Cogent Engineering (2019), 6: 1631009.