

Drilling and completion report essay



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Abstract

This paper projects the processes in drilling a well, positioned to various properties and factors. These factors are accorded as the major determinants of the type of work, time, and a clean process of drilling. This will include aspects of mud weight or density, hydrostatic pressure and the drilling depth in feet. They can be used to determine what the engineers are supposed to do at some point. This point explains the daily events from the first to the last day of the drilling process explaining the decisions and activities that are practiced with some consents. The cost is drilling is one factor that is taken into consideration and adopts mutual interest between the client and the service provider. In this case, the projections of cost and real figures determined by the various aspects of cost will be positioned on the tools, service and amount of labor that is required by the engineer. This will be layered on the type of service, tools, type of wells that is being drilled and the mud type. Projections by the engineer, will also give a foundation of the construction requirements regarding the well, an aspect that may also include safety measures that are supposed to be put in place. The duration and the position of success of the construction after a projected amount of time is quite important in the report, based on the fact that it was successful after 25 days. Every detail regarding the process is on record and was given the attention it required for the whole task to be considered a success.

Introduction

This study seeks to present a drilling report for the horizontal oil producer, the information that shall be here presented sourced from the records of

daily drilling report, (DDR), the time breakdown chart and relevant literature sources. Moreover, the study seeks to give details regarding the horizontal wells project, the completion design of the well, the time spent on both productive and non-productive activities and the estimated cost that suits the project. The records reveal that out of the 571 hours that were allocated for the project, 96 percent was utilized on productive activities with drilling as the main activities. On 3 per cent of time was spent on activities that did not contribute to the progress of the project. Time wasted was attributed to the delayed delivery of items and equipment. The project was completed in a span of 25 days, just as anticipated. Records also suggest that 2, 040, 350 dollars were spent on that drilling exercise. The daily mud cost was 21, 400. 25 and the cum mud cost was 57, 642. 20

Contingency cost estimation could be appropriate the project as it addresses the unforeseen risks, plans for future activities, helps the team leader to evaluate the team member and to allocate the available resources effectively. This type of cost estimation includes the unknown risks in the budget estimates. Hence it can prevent or provide the capacity to deal with the unpredictable hazards. The management can also hire the right personnel to evaluate the situation and establish realistic risks to avoid the challenge of stretching resources to unreasonable risks. Moreover, this type of cost enables better risks management techniques to cater for changes in drilling rates, the need to extend the project and any errors or omissions as the team gets prepared both financial and human resource

Mud weight calculations

Mud weight =

Hydrostatic pressure = Pressure gradient * TVD

The values are shown in the figure below

Depth (ft)	Mud Weight (ppg)	HP
4151	83	17915. 72
4151	83	17915. 72
4151	83	17915. 72
4151	83	17915. 72
4151	83	17915. 72
4151	83	17915. 72
2699	65	9122. 62
2917	67	10162. 83
3733	68	13199. 89
3733	68	13199. 89
3733	68	13199. 89
3733	68	13199. 89
4180	78	16954. 08

5163	78	20941. 13
5945	78	24112. 92
6979	78	28306. 82
7640	78	30987. 84
7916	78	32107. 3
7916	78	32107. 3
7916	78	32107. 3
7916	78	32107. 3
7916	78	32107. 3
7916	78	32107. 3
7916	80	32930. 56
7916	80	32930. 56

The table projects the mud weights that were projected during the drilling duration and the resulting hydrostatic pressure ensured from the weights. Their calculation is ultimately considered on both the depth and the mud weight. It estimates the pressure at every stage of drilling and the illustrations of processes that are supposed to be carried out.

The completion design for the horizontal well

A horizontal well is a well that is drilled to a 90° inclination. This well maintains and the inclined at that angle for a considerable distance. A curve section is normally drilled from the bottom, and the horizontal drill is also directed into the formation. This type of drills includes multiple holes which make the entire procedure more expensive than vertical or conventional wells. Geological techniques are used to select a candidate reservoir and to ensure that the well had maximum and long-term productivity. The pressure drawdown in this type of wells is expected to be minimal to avoid water or gas coning. The drain hole is placed appropriately to prevent early breakthrough of water or gas. Hole cleaning, tubular stress, hole lubricity and torque and drag should be carefully evaluated to attain a successful drilling process. To achieve a horizontal profile at a wished for depth, the well's patterns are associated with a common bottom hole assembly. The short radius, medium radius, and long radius techniques are common for horizontal techniques, they both have distinct benefits. A detailed explanation will be included in this study (Samuel O. Osisanya, 2016).

Horizontal wells have become very popular as they have high production rates and high recovery of reserves. Compared to vertical wells, horizontal wells expose more formation to production, which causes the pressure to drop to the well bore. A preferable technique for drilling horizontal wells has been to use multiple wells and locate them throughout the reservoir. This method reduces resistance to near wellbore by elevating the total availability of the contact area between the producing wellbore and the reservoir. Moreover, this technique reduces the flowing distance of the fluid before it is produced hence reducing the overall resistance to flow. Drilling a horizontal

well is an expensive procedure. However, the well offers numerous benefits which include, maximum production from small energy reservoirs and in low permeability formation, reduced invasion of unwanted formations fluids, recovery of reserve energy, access to irregular pools without additional energy and high penetration. Horizontal wells are heterogeneous and ultimately an increased recovery. The drilling skills and potential of this wells has enabled economic production from the available reserves. A closer look at increasing production from the low permeability reservoirs reveals that the horizontal can achieve this solution as described below. It possible and efficient to drill deep lengths horizontally, in fact up to 200 ft can be drilled horizontally and increased resistance to fluid flow and dynamic control of the geometry. When training and horizontal well, the following factors must be considered, pay thickness, Depth, Porosity, formation pressure, original saturation, absolute permeability, well-spacing, the reservoir temperature, oil and gas characteristics and vertical restriction. To achieve maximum and long-term production of a horizontal reservoir, it is critical to utilize the above-named parameters.

Another important factor to consider before drilling a horizontal well is the classification of the well. The first long radius, which should be 10 to 80/100-ft build rate, the other is the short radius, which should be 1. 50 to 30/1-ft build rate and lastly medium radius, which should be 80 to 200/ 100-ft build rate. Moreover, it is important to consider the various factors that favor the development of the horizontal well. These factors include remote surface location, high viscosity oils, multiple vertical fractures, low anisotropy ratio,

the template slots for offshore development, thin oil rims, unknown geology, exploration drills, and formation thickness.

The advantages of horizontal wells surpass their limitations, and for that reason, they have gained global acceptance. The wells are highly productive, high revenue yield, a broad range of application and high recovery. On the other hand, the aspect of geology is also important to the techniques used in well-drilling. It is important to study the geology of a reservoir to select a good reservoir. For instance, the properties rocks and fluids vary in petroleum resources. Hence their performance should be detected and its future productivity determined using their geological features. The following factors are considered crucial in geology planning, structural map, electronic logs, oriented core data, seismic data and mud logs. Various considerations are taken when inceptions of what is best for the process is projected.

Consistency of the factors is also among the most predictive features that must be analyzed in order to give an insight of what must be done at every stage and the predictive nature of the various prospects in well-drilling.

From the daily drilling report provided, the central objective was to drill a horizontal well for oil. The activities commenced on the 8th June 2012 and proceeded on 2nd July 2012. Following the events that were recorded the team aimed at drilling a long radius horizontal well. The differences between the medium, short and long radius drills are defined by the tilt angle between the upper and lower stabilizers. The size and distance of the bit are the key determinates of build tendency. If first deflection point is close to the bit, a small deflection causes a build tendency that is similar to the larger deflection that is far from the bit. In other words, this mechanism can be

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explained as the near bit deflection causes lower side forces and a less bit offset. Moreover, the DDR categorizes information to include mud transferred, mud dumped and the mud losses and mud cost. The daily mud cost was 21, 400. 25 and the cum mud cost was 57, 642. 20