

CASE STUDY

WELL COST OPTIMIZATION BY AI WELL PLANNER

The trajectory of a well significantly impacts its construction costs, with one key aspect being the expense associated with casing and cementing. Due to multi-level structure of the wellbore geometry, the upper sections incur a substantially higher cost per meter compared to the lower sections, attributed to greater usage of metal and cement. However, this aspect is frequently overlooked during the design phase, resulting in considerable overspending. This case study highlights the effectiveness of integrating AI technology into well design, showcasing substantial cost reductions. In this instance, savings on casing and cement totaled approximately \$500,000.

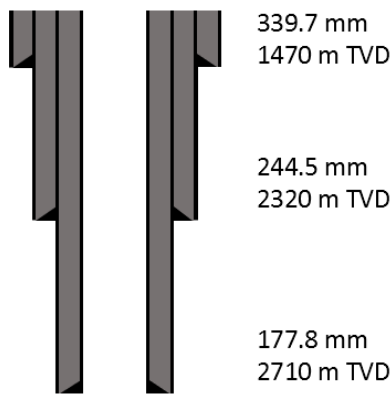


Figure 1a. Wellbore geometry

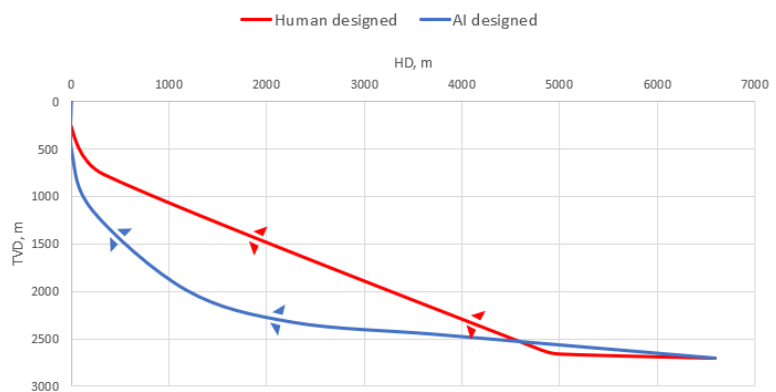


Figure 1b. Red trajectory designed by DE; blue one designed by AI

Originally, a red trajectory (Figure 1b) was planned by a DE for the transport section of an ERD well. We utilized **the AI Well Planner by MWD STD** to design a new trajectory with the aim of minimizing costs of the casing (Figure 1a). The result is depicted as the blue trajectory in Figure 1b. The casing cost for the AI-designed trajectory was \$455,000 less than that of the human-designed trajectory. This reduction was achieved by shortening the length of the two upper casing strings: 5166 m of 339.7 and 244.5 casings for the AI-designed well path compared to 7481 m for the human-designed trajectory. A detailed cost breakdown is provided in Table 1. Moreover, the AI-designed trajectory was assessed by drilling experts as being more efficient in terms of drilling.

Human designed trajectory (Red)							AI designed trajectory (Blue)						
#	Drilling			Casing			#	Drilling			Casing		
	Length (m)	Price (\$/m)	Cost (\$)	Length (m)	Price (\$/m)	Cost (\$)		Length (m)	Price (\$/m)	Cost (\$)	Length (m)	Price (\$/m)	Cost (\$)
1	2,600	130	338,014	2,600	315	819,034	1	1,616	130	210,036	1,616	315	508,932
2	2,281	130	296,515	4,881	175	854,173	2	1,935	130	251,507	3,550	175	621,307
3	2,650	130	344,501	7,531	70	527,170	3	4,420	130	574,564	7,970	70	557,943
Subtotal	979,030			2,200,377			Subtotal	1,036,107			1,688,143		
Total				3,179,407			Total				2,724,250		

Table 1. Breakdown of red and blue trajectory costs