# ENHANCEMENT OF ROCK DRILLING PERFORMANCE USING WATER SOLUBLE POLYMERIC ADDITIVES



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Award of Degree

## Doctor of Philosophy

by

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# CHAPTER 6

# CONCLUSIONS

Based on the research work, following conclusions are drawn:

- Laboratory testing setup for studying drilling performance is convenient as well as economical in comparison to field testing. Also, it facilitates controlled variation of the parameters of rock drilling that facilitates to study of their invisible impact on drilling performance.

- In general, ROP increases with bit rotational speed as well as load on the bit. It depends on the limitations of the drilling setup to maintain the constant bit RPM throughout the drilling operation with the help of the RPM feedback system.

- As a eco-friendly natural polymeric additive to drilling fluid, aqueous solution of guar gum (GG) has also show significant improvements, compare to the tap water alone as drilling fluid.

- ROP is the most important drilling parameter for assessing drilling performance, The best performing drilling fluid additive for achieving high ROP was CMC 70 ppm.

- As the best drilling fluid additive to improve overall performance, Hy-St-g-PAM 90 ppm has performed excellent among others.

# Scope for Future Work

- To improve the value of this research, validation of the proposed methodology, and laboratory testing in the field experiment may performed.

- Mobility and compaction of drilling setup, to make it compatible for field experiment and industrial use.

- Range of variation in drilling and rock parameters can be increased for the better understanding their role in drilling performance.

- Impact of further drilling fluid additives, focused on various particular field drilling problems, can be experimented.

- Numerical models can be developed using multi regression analysis as well as machine learning techniques.