Water Flooding Principles and Operations

Table of Contents:

BTS Training & Consultancy

1st floor, Incubator Building, Masdar City, Abu Dhabi, UAE

00971-2-6452630

00971-50-6652671

info@btsconsultant.com

www.btsconsultant.com

Introduction:

Water flooding is one of the most important methods of improving recovery from oil reservoirs. This section of the course concentrates on reservoir and field operations aspects of water injection for pressure maintenance and secondary recovery. The candidates will study fractional displacement theory and all methods available in the oil & gas industry to predict oil recovery.

The objective of the course is to provide the participants with a solid understanding of the challenges and solutions to numerous water flooding issues. Hands-on examples and exercises are used throughout the course to help participants with understanding all topics presented in this course.

Water flooding has long been proven as the simplest and the lowest cost approach to maintaining production and increasing oil recovery from an oil reservoir. However, these benefits may fall far short of the expectations unless the time-tested concepts and practices are clearly understood and judiciously implemented. These concepts and practices aim at process optimization -reducing production cost while minimizing waste and maximizing oil recovery and income. This course is light on theory but heavy on proven and successful practices. Published case histories of projects around the world are reviewed to provide an understanding of divergent points-of-view, what works where, what fails when, and why? This training covers all elements of a waterflood project from A to Z - from source water selection to produced water disposal and everything in between.

Objectives:

By the end of this course delegates will be able to:

- Distinguish rock characteristics and fluid properties that control displacement of oil and thereby influence oil recovery
- Predict incremental oil recovery and develop production profile using required data and its sources
- Specify components of a well-designed water-flood plan
- Estimate injection water requirement, incremental oil production, and volumes of produced water
- Monitor water-flood performance and optimize oil recovery through new technology.
- Use reservoir simulation to address basic recovery mechanisms and optimization.
- Understand and practice the prediction and interpretation of oil & gas reservoirs under different known methods of water Injection.
- Review practices of the engineering aspects of water flooding and prediction the immiscible water flooding displacement process.
- Review primary recovery mechanisms through the fundamentals of rock and fluid interaction to the application of classical water flood prediction techniques.
- Technical knowledge of water flood pattern options and the effect of selection and orientation on flood performance.
- Discuss and explore the practical application of water flooding fundamental: Mobility Ratio; Reservoir Heterogeneity and Sweet Efficiencies in water flooding and flooding stages.

- Injection Wells Specifications, Control and Hall Plot as a Monitoring Tool of after Injection Wells.
- Explore practical reservoir management for mature water flooding.

Who should attend?

Reservoir Engineers, Production Engineers, Facilities Engineers, Petroleum Engineers, Research and Development Engineers, and operations who are involved with some aspects of a new or existing water flood project; geoscientists and professionals who want to get a better feel for the entire process of planning, development, management, and recovery optimization of a water flood project.

Course Outline:

- General water flooding
- Overview of petroleum Geology and water flooding implications
- Review Data Requirements for reservoir description
- Rock properties and water flooding
- Production performance

- Analytical techniques
- Why is water and gas injection needed?
- Reservoir characterization and aquifer influence
- Water-displacing-oil flood mechanisms
- Design aspects

- Recovery expectations and production forecast
- Production engineering aspects and performance indices
- Associated problems and risks and ways to minimize impact
- Reservoir monitoring
- Optimization of oil recovery
- Review of case histories
- Oil recovery enhancement beyond water-flood
- Water flooding examples, reservoir monitoring and management