



# WE019: Water Injection System



## Training Description:

Water injection has proved to be one of the most economical methods for reservoir pressure management. The technology can be valuable in helping maintain reservoir pressure, enhancing production of hydrocarbon reserves, and reducing the environmental impact through reinjection of treated and filtered produced water.

One of the most efficient methods of enhancing heavy oil recovery is water injection. In heavy oil recovery, Halliburton's temporary water injection systems provide operators with a cost-effective means of quickly analyzing the potential benefits of using water injection to manage a specific reservoir and enhance overall productivity.

The course will highly discuss on how to treat the water on the platform. Where the water is injected to the oilfield, it helps increase pressure and thereby production/recovery of more oil. Produced water handling on the surface by proper disposal or by conditioning the water and re-injecting it to increase oil recovery from an existing reservoir.

## Training Objectives:

By the end of the training, participants will be able to:

- ✓ How to treat the water on the platform
- ✓ Produced water handling on the surface by proper disposal or by conditioning the water and re-injecting it to increase oil recovery from existing reservoir
- ✓ Enhancing the Oil Recovery Process
- ✓ Understanding Water Treatment Process
- ✓ Determine the Injection Water Recourses
- ✓ Know Biological Water Treatment
- ✓ Know the principle of Corrosion for Water Treatment
- ✓ Understanding the operation process of Water Injection

## Training Designed for:

This course is intended for junior operating staff involved in the field operation of water treatment facilities, including development and operations petroleum and production engineers and other technical staff.

## Training Program:

### DAY ONE:

- ❖ PRE-TEST
- ❖ Introduction
- ❖ **Module (01): Enhanced Oil Recovery Processes**
  - Introduction
  - Review of Geology and Hydrocarbon Accumulations
  - Surface Tension
  - Capillarity
  - Saturation
  - Fluid Displacement



- Reservoir Drive Mechanisms
- Oil Recoveries
- Production Engineering Overview
- Decline Analysis
- Pressure Maintenance Schemes
- Line Drive Water Floods
- Pattern Water Floods
- Other Tertiary Schemes
- ❖ **Module (02): Injection Water Sources**
  - Produced Water
  - Quantities
  - General Impurities
  - Treatment Overview
  - Fresh Water
  - Quantities
  - Treatment Overview
  - Sea Water
  - General Impurities
  - Treatment Overview

#### DAY TWO:

- ❖ **Module (03): Injection Water Quality Requirements**
  - Solids
  - Dissolved Solids
  - pH
  - Basic Review of Chemical Calculations
  - Precipitate Reactions and Their Significance
  - Introduction to Clay Mineralogy and Its relationship to Formation Damage and Solids Control
- ❖ **Module (04): Produced Water Handling**
  - Inlet Separation
  - CPIs
  - Filtration
  - Skim Tanks
  - Oil in Water Emulsions
  - Treating
  - Polishing Equipment
  - Flotation
  - Disposal Options
  - Regulatory Requirements

#### DAY THREE:

- ❖ **Module (05): Biological Water Treatment**
  - Introduction
  - Problems Caused by Organisms in Water





- Plugging
- Types of Microorganisms
- Problem Definition and Scope
- Sampling, Monitoring
- Treatment for Control
- Biological
- Lagoons
- Biological Tower
- Bio-Disc
- ❖ **Module (06): Corrosion & Water Treatment**
  - Introduction
  - Principles: Subsidence
  - Filtration
  - Dissolved Gas Removal
  - Coagulation
  - Chlorination
  - Iron Removal
  - Water Softening
  - Silica Removal
  - TDS Removal
  - Application to Sea Water

#### DAY FOUR:

- ❖ **Module (07): Operations and Operating Problems**
  - Skim and Settling Tanks
  - Parallel Plate Separators
  - Filters, Gas Flotation Units
  - Lime Soda Process
  - Coalescers
  - Ion Exchange Unit
  - Electrostatic Treaters

#### DAY FIVE:

- ❖ **Module (08): Design Considerations**
  - Water Source
  - Water Problems
  - Water Quality Needs
  - Compatibility
  - Scales
  - Corrosion Control
  - Recycling Economics
  - Case studies
- ❖ Course Conclusion
- ❖ POST-TEST and EVALUATION





## Training Requirement:

“Hand’s on practical sessions, equipment and software will be applied during the course if required and as per the client’s request”.

Please note that the above topics can be amended as per client’s learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

## Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Software & General Discussions
- Pre and Post Test

## Training Certificate(s):

Internationally recognized certificate(s) will be issued to each participant who completed the course.

## Training Fees:

**As per the course location** - This rate includes participant’s manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01<sup>st</sup> of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

## Training Timings:

### Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:30	Recess (Prayer Break & Lunch)
13:30 - 15:00	Last Session

**For training registrations or in-house enquiries, please contact:**

**Aisha Relativo:** [aisha@cmc-me.com](mailto:aisha@cmc-me.com)

Tel.: +971 2 665 3945 or +971 2 643 6653 | Mob.: +971 52 2954615

Training & Career Development Department

