# SmartEOR

AN INNOVATIVE TOOL FOR EOR SCREENING

FEATURES:

☐ BUILD CO2 FLOOD, VAPORIZING GAS DRIVE, CONDENSING GAS DRIVE, THERMAL, AND CHEMICAL FLOOD MODELS

☐ IDENTIFY ANALOG FIELDS IN THE WORLD

☐ PERFORM SOPHISTICATED ECONOMIC ANALYSIS

☐ MANAGE MULTIPLE TYPES OF EOR CASES

BENEFITS:

☐ HANDLE DIFFERENT TYPES OF EOR PROCESSES FROM ONE PLATFORM

☐ QUICKLY BUILD EOR SIMULATION MODELS FOR DIFFERENT EOR PROCESSES

☐ RELIABLY PREDICT RESERVOIR PERFORMANCE BASED ON LIMITED DATA

☐ QUANTIFY INCREMENTAL RECOVERY FROM DIFFERENT EOR PROCESSES

☐ IDENTIFY THE BEST EOR PROCESS FOR A RESERVOIR


PRC Plano Research Corporation
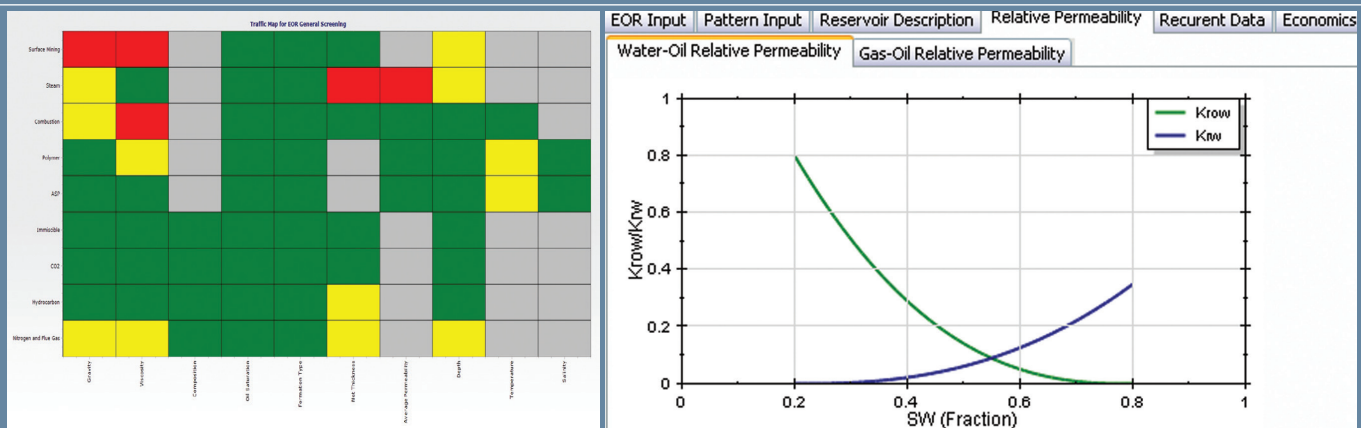
ABOUT PLANO RESEARCH:

☐ Plano Research Corporation provides a wide array of sophisticated products for the oil and gas sector. Our proprietary technology has been designed to simplify and speed up the analysis of routine and complex problems faced by geoscientists and engineers during all phases of the oil and gas exploration and development. Currently, we offer the following products:

FlowSim (a black oil and compositional reservoir simulator),

CAESAR (a well and reservoir management application),

Transients+ (a pressure transient analysis package),

Analytics (a waterflood optimization tool),

PetroPhase (a phase behavior software package),

PVT (a fluid property data application),

Oil3D (a gas, oil, and water simulation tool),

GeoTrak (a resource analysis and exploration toolkit),

PetroTrak (an online well and field management application),

CoreLog (a petrophysical interpretation tool),

Galaxy4D (a reservoir characterization software),

Sigma (a seismic interpretation package), and

SmartEOR (an EOR screening tool).

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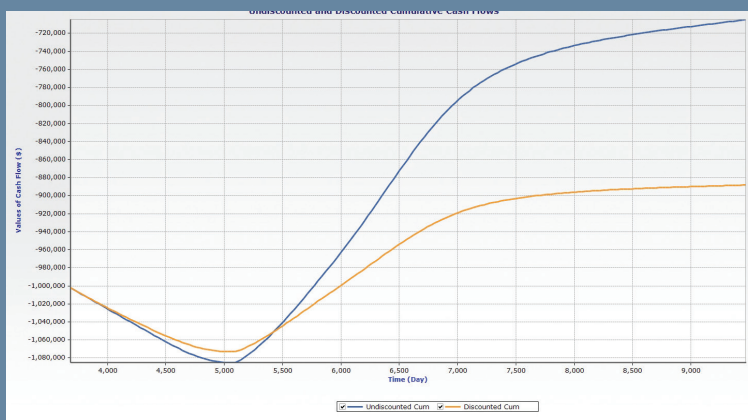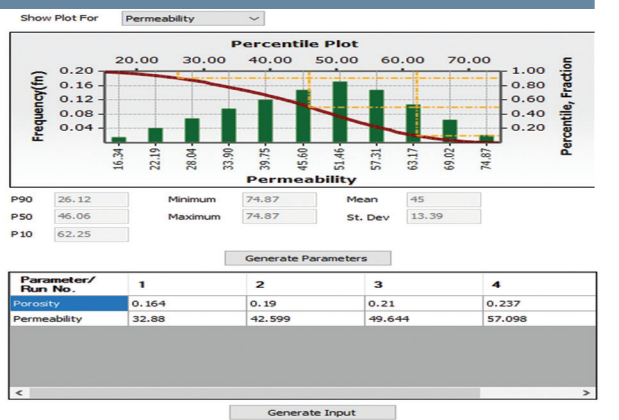
SmartEOR is an innovative software application used to screen fields for different EOR processes and make reliable predictions of reservoir performances. SmartEOR utilizes reservoir simulations with limited user input data. For gas injection processes, it automatically creates an EOS that matches PVT properties at displacement pressures and performs compositional simulations for both waterfloods and gas floods. Chemical floods, like a surfactant/polymer flood model, can also be modeled in the same platform as a gas flood. Thermal flooding can be evaluated for steam or hot water injection as well as combustion. Incremental recoveries from different EOR processes can be compared and the best EOR process can be picked for a particular reservoir. Economic analysis is performed using cash flows for different EOR processes. SmartEOR can also locate analog fields by comparing reservoir and fluid properties. With its integrated platform and reliable predictions, SmartEOR is an ideal tool to make rapid and accurate decisions on EOR implementation.

Create EOR Cases

Model gas flood cases with a compositional simulator

- □ CO2 Flood for CO2 injection
- □ Vaporizing Drive
    - □ Flue Gas
    - □ N2
    - □ Lean Gas
- □ Condensing Drive
    - □ Rich Gas
    - □ LNG Gas

Model chemical flood cases with a multiphase, multi-component chemical flood simulator

- □ Surfactant/Polymer Flood
- □ Three-Dimensional
- □ Four phases
- □ All chemical flood physics considered

Model thermal flood cases
- □ Steam Injection
    - □ Steam Flooding
    - □ Huff and Puff
- □ Hot Water
- □ Combustion

Model Builder

EOR Input | Pattern Input | Reservoir Description | Relative Permeability | Recurrent Data | Economics

Fluid Composition | Observation Data

Fluid Unit Total	Reservoir Fluid Percentage 100	Injection Gas Percentage 100
N2	0.4	1
CO2	4.6	3
H2S	1.04	0
C1	24.23	80
C2	9.25	10
C3	7.52	5
IC4	0.98	1
NC4	3.79	0
IC5	1.27	0
NC5	2.33	0
C6	3.54	0
C7+	41.05	0
C7+ MW	245	
C7+ SG	0.86 g/cc	

Model Builder

EOR Input | Pattern Input | Reservoir Description | Relative Permeability | Recurrent Data | Economics

Fluid Composition | Observation Data

Displacement Pressure (Pd)	3500	psia
Reservoir Temperature	212	Deg F
Pb	1873	psia
Estimated MMP	6989.0870	psia
Density at Pd	46.925	lbm/ft^
Viscosity at Pd	0.8213	cp
Bo at Pd	1.333	RB/STB
Rs at Pd	554	scf/stb

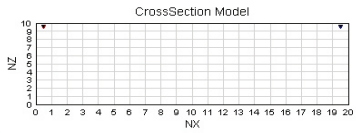Estimate with Correlation

Kuo

Model Builder

- Pattern Selection
- Reservoir Description
- Relative Permeability
- Well Recurrent Data
- Economics
- Sensitivity Analysis
- Uncertainty Analysis

- Physical Property Data for Chemical Flood
  - Phase Behavior
  - IFT
  - Viscosity
  - Adsorption
  - Capillary Pressure
  - Relative Permeability
  - Diffusion
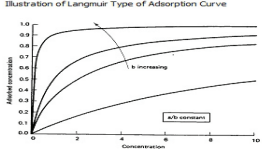
Predictions and Forecasts

- Incremental Recoveries
- Production Curves
- Retention for SP Floods
- Economic Analysis

- With a user-defined oil price, facility cost, and operation cost, SmartEOR will calculate:
  - Cumulative cash flow with discount rate
  - Cumulative cash flow without discount rate
- General Screening with Taber's method
- Using reservoir and fluid properties, SmartEOR can identify analog EOR fields in the world