Cascade3 inputs

Well geometry

TVD well

Bottom TVD

Top TVD

Borehole diameter

Friction factor

Permeable zone

Active flow zone

Well flow profile

Liner diameter

Hydrodynamic

Matrix porosity

Matrix compressibility effect

Matrix flow anisotropy factor

Permeability

Mean piezo conductivity

Hydrodynamic external radius

Temperature external radius

Current reservoir pressure

Hydrodynamic per zone

Measured middle zone depth

Length

Normalized annulus permeability

Well conductivity

Sandface conductivity

Filter

Geothermal

Heat flux

Heel temperature

Lateral temperature gradient

Thermodynamic

Upper thermal conductivity

Matrix thermal conductivity

Lower thermal conductivity

Upper heat capacity

Matrix heat capacity

Lower heat capacity

Matrix thermal expansion

Thermo-physical anisotropy factor

Fractures

Measured depth

Distance from the bottom

Opening

Half-length

Height

Permeability

Skin

Injection / production history

Flow rate or pressure history of the well from beginning of well operation

Temperature history of injected fluid

Cascade3 inputs

Fluid properties (PVT)

Oil

Referenced oil density
Bubble point pressure
Rs background, correlation input parameter
Density at standard conditions
Oil formation volume factor at reservoir conditions
Reservoir pressure (pvt original)
Reservoir temperature (pvt orginal)
Bubble point pressure,
Bubble point temperature dependency factor
Adjustable parameter
Apparent dead oil density
Oil coefficients of thermal expansion
Oil compressibility
Oil viscosity at reservoir conditions

Surface tension

Oil-gas surface tension coefficient
Oil-water surface tension coefficient
Water-gas, surface tension coefficient

Water

Water density at reservoir conditions
Water coefficients of thermal expansion
Water compressibility
Water viscosity at resrvoir conditions, Pa*s
Adjustable parameter
Adjustable parameter

Gas

Gas molar mass, kg/mol
Latent heat of gas disssolution in oil J/kg
Gas formation volume factor at reservoir conditions
Adjustable parameter

Relative permeability (SCAL)

Oil

Residual saturation (oil-water system)
Corey oil-water
Residual saturation (oil-gas system)
Corey oil-gas
Power function of the gas saturation

Porous media type

Porous media type

Water

Irreducible saturation (oil-water system)
Corey water
Residual saturation (gas-water system)
Corey water-gas
Power function of the gas saturation

Gas

Residual saturation
Corey gas
Correction factor

Cascade3 outputs

Flow	Wellbore flow
	Matrix flow rate
	Annulus flow rate
	Fracture flow rate
	Fracture inflow rate along half-length
Temperature	Wellbore temperature
	Completion temperature
	Annulus temperature
	Sandface temperature
	Geothermal temperature
Pressure	Completion pressure
	Sandface pressure
	Reservoir pressure
	Fracture pressure
Output plots	Pressure distribution in reservoir - 3D plot
	Temperature distribution in reservoir - 3D plot

Cascade3 specifications

Model framework	3D Fine-grid
Flow profile type	Continuous
Modeling physics	Hydrodynamic and thermodynamic
Well inclination, deg	75 to 105
Fluid type	Low-compressible fluid
Phase mix	Multiphase with fixed phase proportions
No. of inputs	80
No. of outputs	16
Flow geometries	Radial, linear [fractures], spherical
Completion scheme	Barefoot, cased
Completion types	All (liner, slotted liner, sandscreen etc)