D11 • Selective Inflow Performance

D11.1 • Access & Initialization



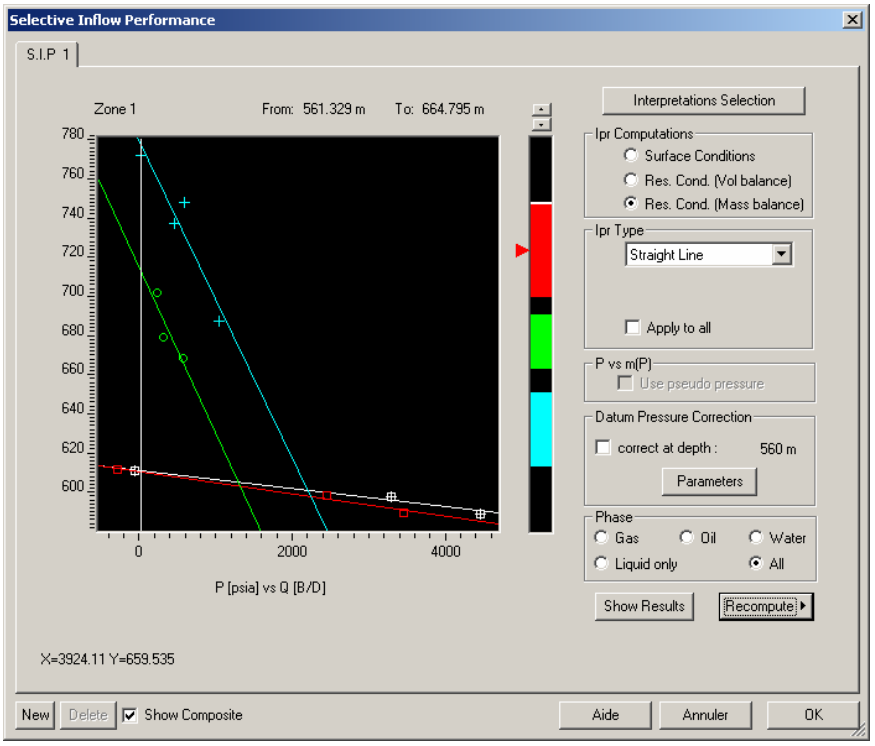
The SIP option is part of the Special page of the control panel. It is enabled when Reservoir zones (green) have been defined and a sufficient number of valid interpretations exist:
At least two interpretations (in two different surveys) are present,
Schematic logs exist for those interpretations.

Values of rate and pressure are looked up automatically in each interpretation by interpolation of the schematic rate logs at the top of each reservoir zone.

An original default calculation is run, using a straight line IPR, with the contributions estimated at reservoir conditions.

D11.2 • SIP dialog

The SIP analysis can contain an unlimited number of SIP objects. New SIP's are created using the New button. With more than one SIP, the Delete button is enabled and can be used to delete the current SIP.



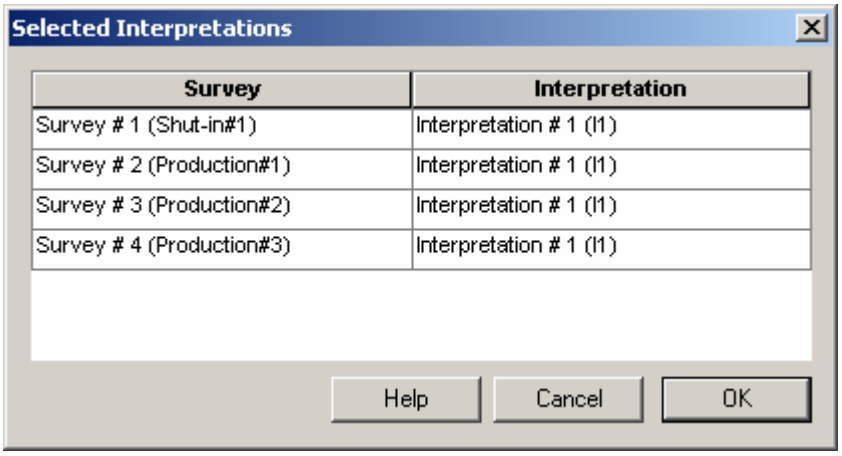
Note that aspect of the IPR's can be customized for the screen and printout in the « Settings » « Display » option. Coolrs and symbols can be modified.

Interpretation Selection

By default, the first valid interpretation for each survey will be selected; an interpretation is considered as valid when schematic logs have been generated.

By clicking on the 

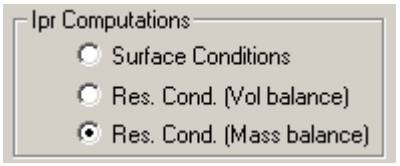
button, the user access the following dialog:



The 'Selected Interpretations' dialog lists the different surveys with the valid interpretations associated to each of them. The state of the grid shows the current selection. This selection can be modified from a drop list by clicking on the interpretation the user wishes to remove or change or add. Note that at least two valid interpretations are required. This setting applies to all the IPR's within the same SIP.

IPR Computations

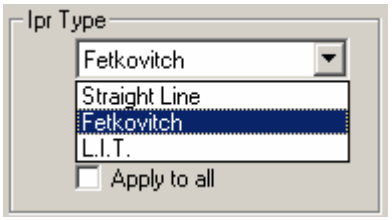
The user can plot and display the results at downhole/reservoir conditions or at surface conditions; two different options exist for reservoir conditions, contributions can be computed using a mass or a volumetric balance on each reservoir zone.

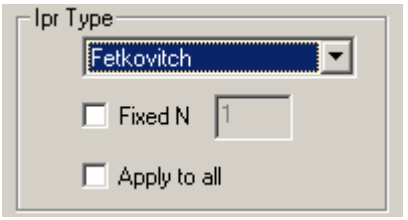


IPR Type

The user can decide to fit the data with different types of IPR equations: Straight line, C&n, and LIT relations. The straight line computation is selected when first creating a new SIP analysis; the user can switch between options from a drop list in the Ipr Type section. Different type of Ipr equations can be selected for

different within the same SIP object. The selection applies to the active Ipr. The user can decide to apply the current selection to all the Ipr's by checking the "Apply to all" box.

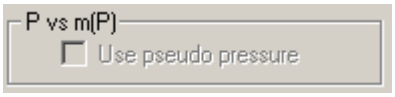




The straight line computation is selected when first creating a new SIP analysis.
If the Fetkovitch type has been selected, an option that allows the user to fix the N parameter to certain value will open.

Pressure or Pseudo-pressure

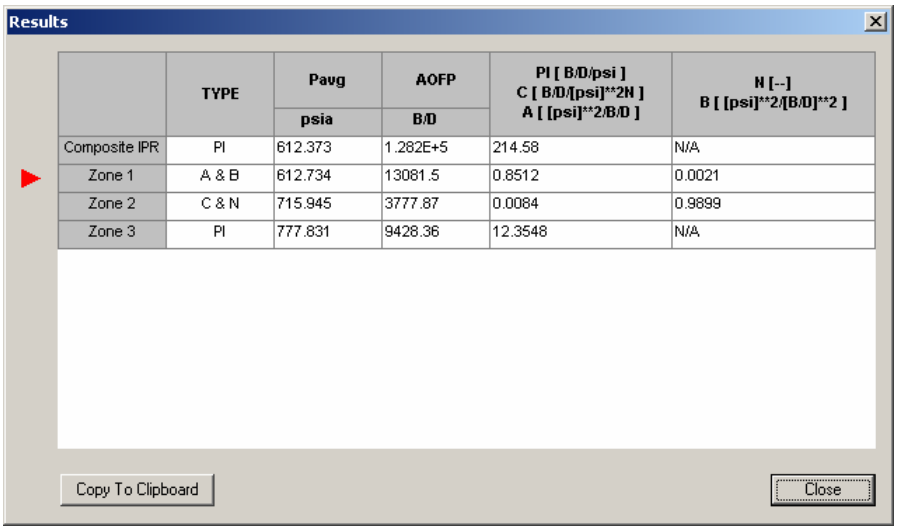
With gas, one can use the gas pseudo-pressure instead of pressure. Note that each IPR point is for a specific temperature, and the m(p) value is calculated at that temperature. This option is open only if all selected interpretations include a gas phase in their PVT.



IPR Results

The results are summarized in the results grid dialog popping up when clicking on the 

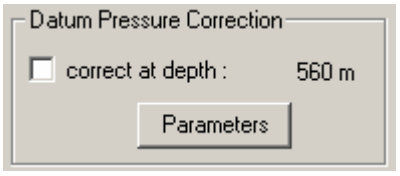
button:

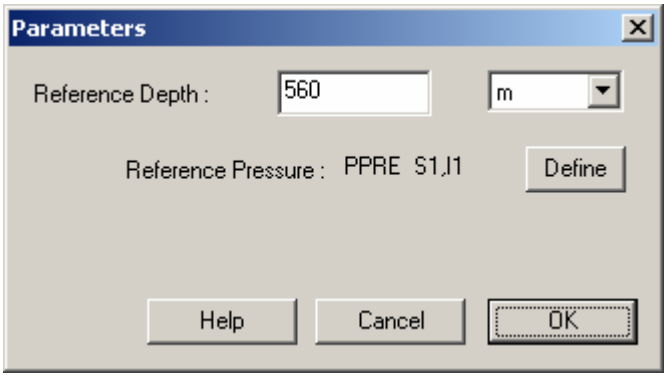


Depending on the number of valid data points, the results will show the Ipr parameters for the selected Ipr type and the optimum flow potential AOFP derived from the computation.

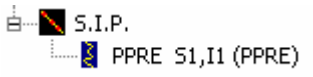
Datum Pressure Correction

To enable this option the Parameters button must first be selected.
This option is used to correct for the hydrostatic gradient of the well bore fluid column, so that pressure potentials from layers at different depth can be compared to an arbitrary common datum.



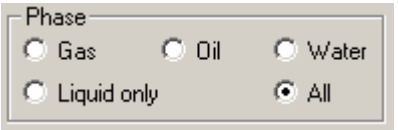


The default is to generate the SIP without pressure correction to a common datum. To enable this option the Parameters button must first be selected.
In addition to a reference depth, a pressure profile, ideally the shut-in profile is selected. When pseudo pressure is used a temperature profile is also required. This is to calculate Pavg from m(Pavg). By checking the check box called 'correct at depth', the computed correction is applied to the data point and IPR lines.



Inside the data browser, a node represents the SIP analysis. Definition of the pressure/temperature profiles for datum correction can also be made by dropping the desired channels on that node by checking the check box called 'correct at depth', the computed correction is applied to the data point and IPR lines.

Phase Selection

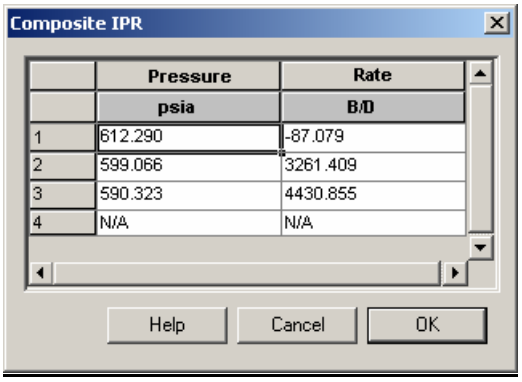


Although SIP theory only apply to single phase flow, with a multi-phase PVT, one can select the phase to use in the SIP calculation; only contribution of the selected phase will be taken into account.
The default is set to the phase with the most important total contribution in each survey (the condition must be consistent between all surveys); the mixture option is chosen otherwise.
This facilities has been implemented so that the user can withdraw the minor contribution of marginal phases showing in the rate schematic log (typically bottom zone water production in an oil or gas well).

SIP Plot Options

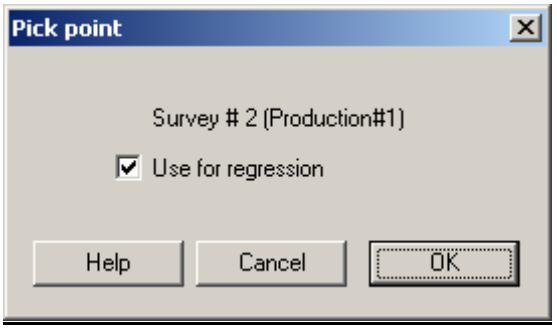
The SIP plot is similar to the Zone/Rates and Spinner Calibration plots and has the same zoom facilities. A right click in the plot brings up the zoom popup menu. To the right of the plot is a graphical representation of the defined reservoir zones and an automatic top zone which represents the total IPR; The user can select each zone by a click or use the up/down arrows.
A right click on the SIP plot brings up a popup menu with:

View points
When selected, a grid dialog pops up showing the data points [pressure, rate] for the current active Ipr :

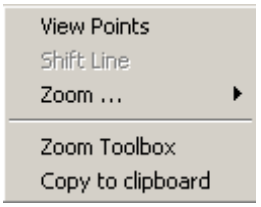


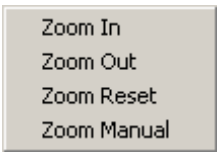
Shift line
Enabled only when the selected method is straight line, and the active IPR is not the composite IPR. Click and drag on the plot to modify the IPR interactively. If the Results dialog is in display, values are updates while dragging the line.

Pick point
Click with the left mouse button near a particular point and a dialog appears indicating the exact source of that points. A checkbox is given to disallow this point in the IPR calculation. In order to update the result parameters, a re-compute for the active zone must be performed.



Zoom
Like in any other Emeraude X-Y plot, gives access Zoom In, Zoom Out, Zoom Reset, Zoom Manual options.





Show composite option

The user can choose to display or not the Ipr composite using the check box 

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This setting applies to all the Sip's within the Sip analysis.

Display zones option

In order to avoid confusion, the number of displayed Ipr's in a SIP plot is limited to ten; the user can change between different zone ranges using the following spin control 

This control will show only when more than 10 reservoir zones are present.
The Sip plot and the results dialog update themselves according to the zone range selection.

D11.3 Output

One page for each SIP plot can be included in the Report. In addition a SIP plot can be copied to the clipboard in WMF format.

Note that aspect of the IPR's can be customized in the « Settings » « Display » option. Colors and symbols can be modified.

