

Productivity Plots = J-plots

A set of direct methods of analyzing the [productivity index](#) assuming that both [drain-area formation pressure](#) and [bottomhole pressure](#) data is available, at least in select time moments:

Unweighted J-plot	t-weighted J-plot	q-weighted J-plot	Hall Plot
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It is highly recommended to plot [sandface flowrates](#) rather than [surface flowrates](#) to achieve better linearity in correlation for [stabilized reservoir flow](#).

Although it is equally applicable to [producers](#) and [injectors](#), due to lack of [BHP](#) and [formation pressure](#) data availability for [producers](#) in most practical cases in the past the [J-plots](#) analysis was mostly applied for [water injectors](#).

Since the [BHP](#) and [formation pressure](#) data are not readily available for the same time moment the interpolation is required, which usually lead to a high degree of uncertainty but due to integration in weighing the [J-plots](#) coordinates it is not as high as with raw interpolated values.

The most effective [J-plots](#) are [q-weighted J-plot](#) and [Hall Plot](#).

Comparison of various [J-plots](#) in different production scenarios is given below.

Sample #1 – Constant rate production

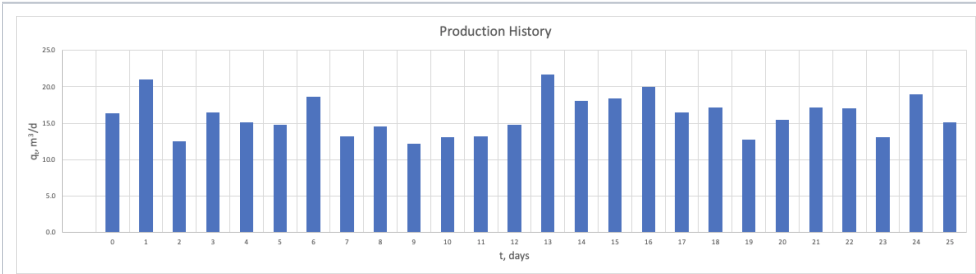


Fig. 1.1. [Production History](#) plot

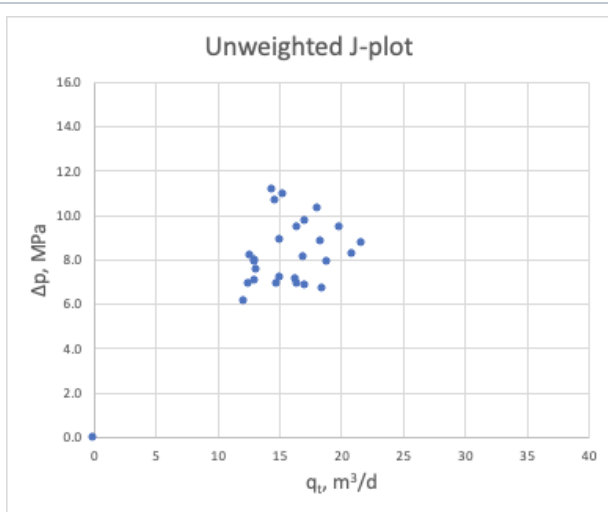


Fig. 1.2. Unweighted J-plot

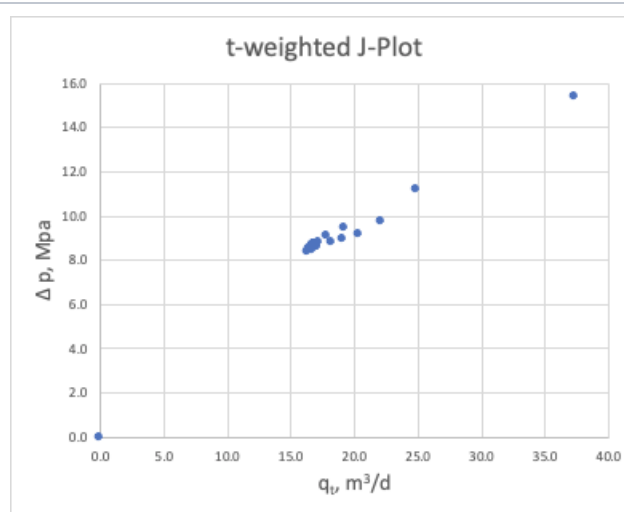


Fig. 1.3. t-weighted J-plot

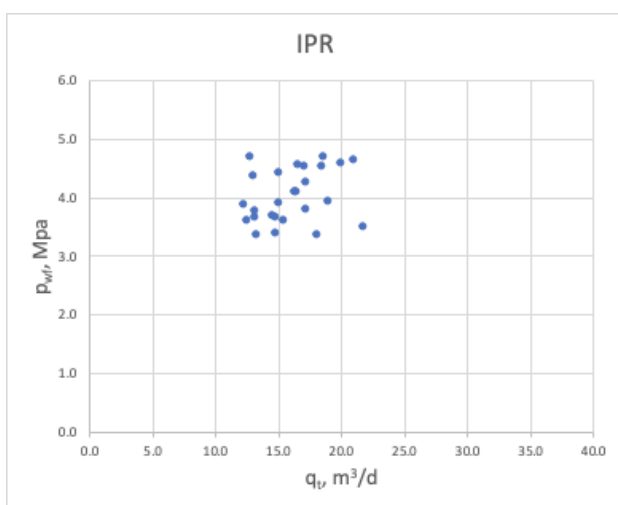


Fig. 1.5. Inflow Performance Relationship (IPR)

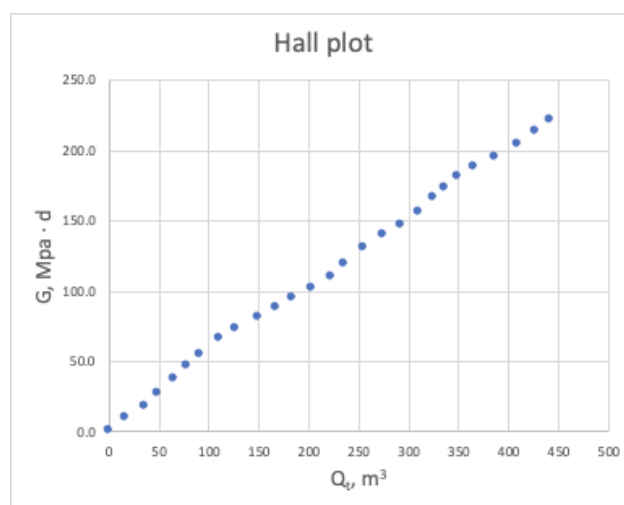


Fig. 1.6. Hall Plot

Sample #2 – Constant rate production with shut-down period

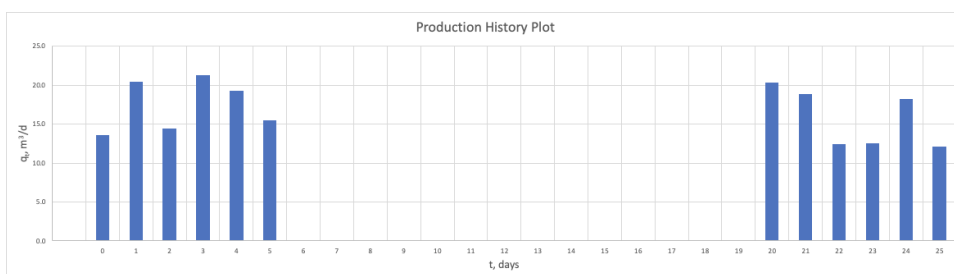


Fig. 2.1. Production History plot

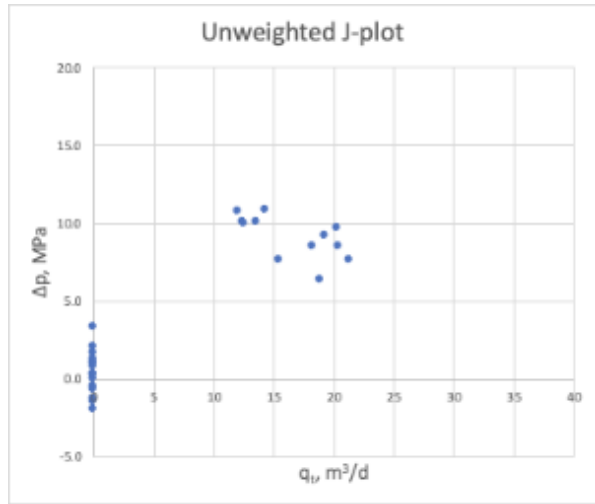


Fig. 2.2. Unweighted J-plot

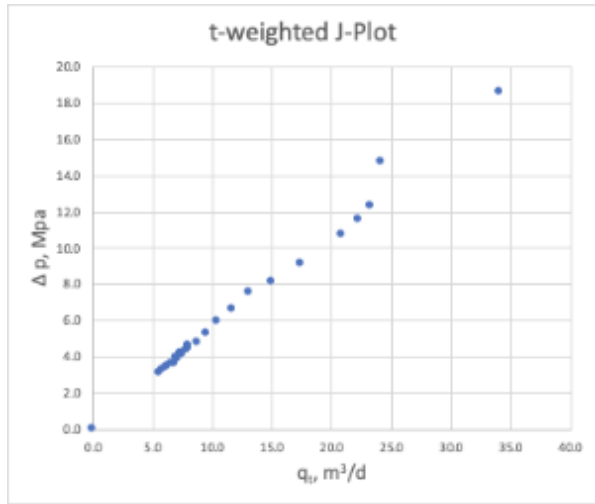


Fig. 2.3. t-weighted J-plot

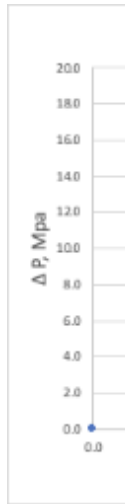


Fig. 2.4. q

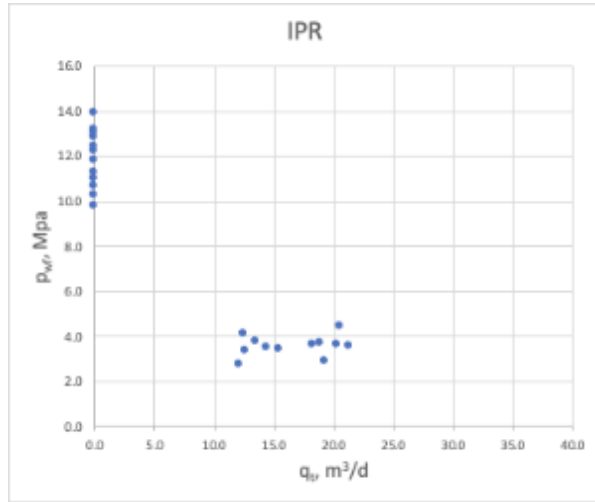


Fig. 2.5. Inflow Performance Relationship (IPR)

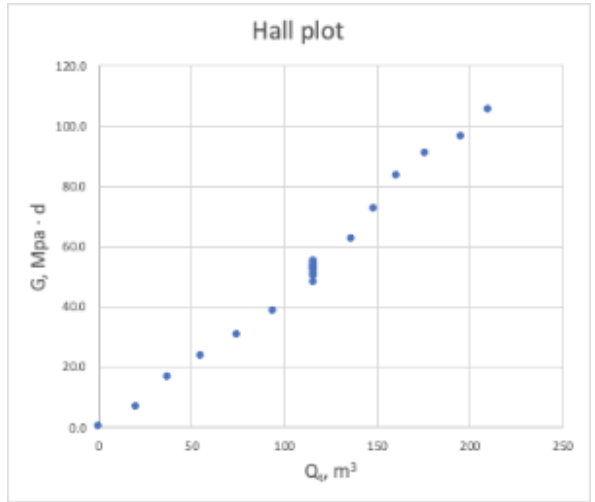


Fig. 2.6. Hall Plot

Sample #3 – Declining production

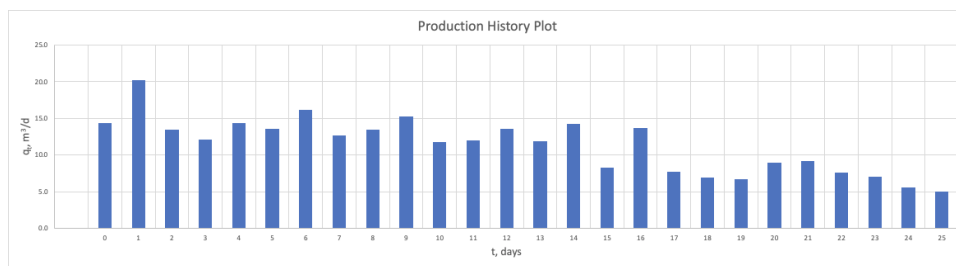
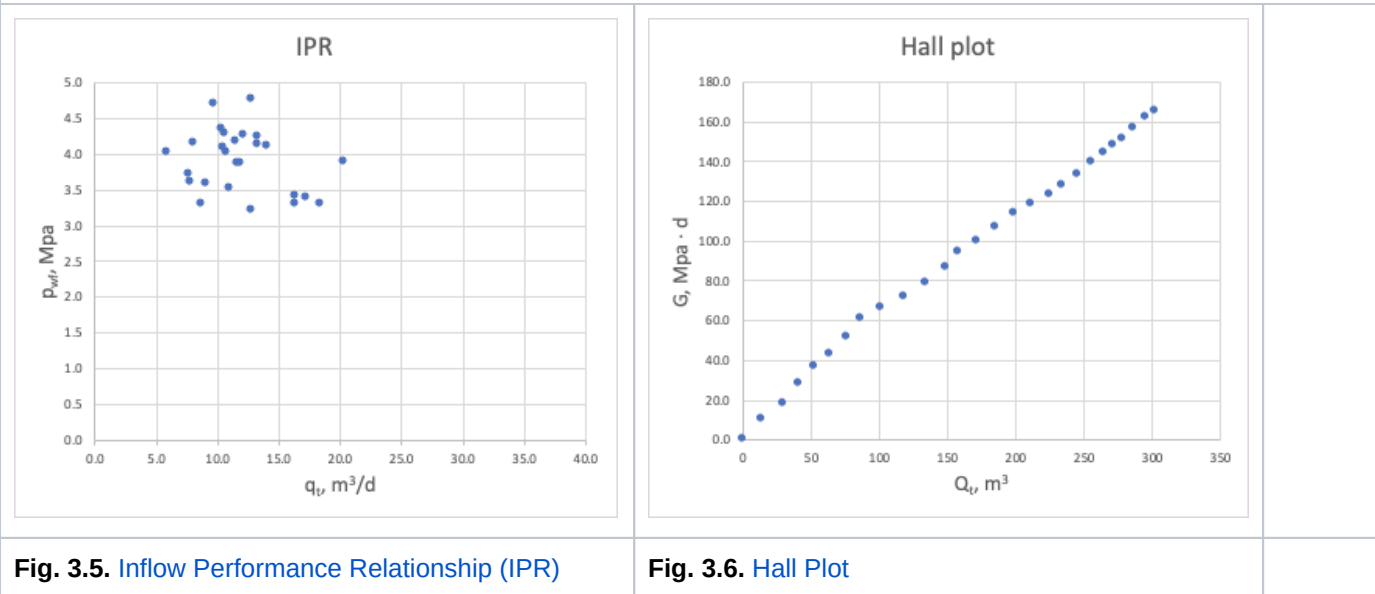
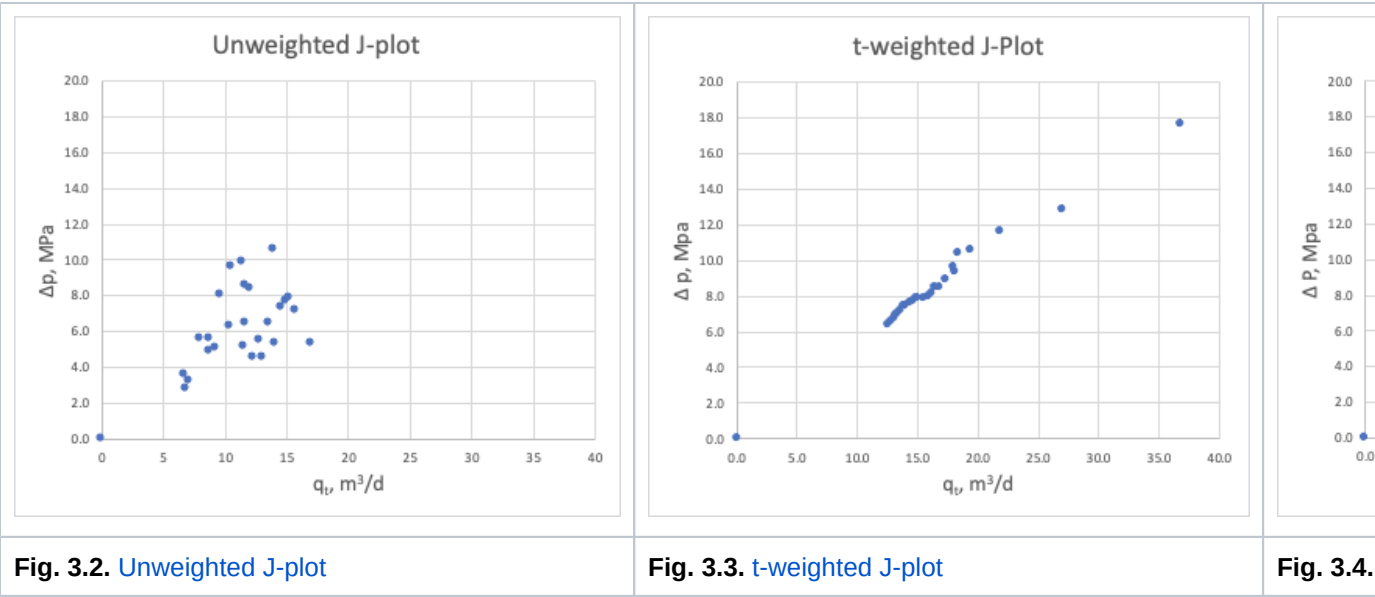


Fig. 3.1. Production History plot



See Also

[Petroleum Industry / Upstream / Production / Subsurface Production / Field Study & Modelling / Production Analysis / Productivity Diagnostics](#)