



Four-X Hint

Express Yourself



This hint is part of a semi-regular series 'published' on the Whittle User's Email Discussion Group

Expressions have been in Four-X a long time now. They are very powerful and give you flexibility to include a lot of detail into your designs, they're good, enough said.

Under the command line version of Four-X expressions were stored on line 19 of the parameter file after a code to identify the expression. That code was then used in the appropriate location for the parameter you wished to define. You could also use functions and expression in the relocking program, to compute MCAF and PCAF (Mining and Processing Cost Adjustment Factors). These features also function in the same way in the Four-X Analyser, you can define them under the expression tab as well as line 19 of a parameter file when loading a model.

Now you are also able to insert and edit expression directly into the dialogue areas for the parameter they define. In The Four-X analyser anywhere you see the blue italicised '*fx*' symbol on the right-hand side of the dialogue field you will be able to use the expression builder to create your expressions. The expression builder has the big advantage that you can use the 'check expression button' your expression for 'internal consistency', syntax and valid codes for variables and codes. [Unfortunately it doesn't stop you making errors in computations]

HINT #1 – Expressions can be imbedded in other expressions

I've noticed that once people start using expression, they quickly get addicted. They soon have lots of them, nice long ones and most of them are very similar only one factor changing for each rock type or processing method. This adds up to a lot of typing [This is both boring and a good way to make mistakes]

You can simplify this by defining the long unchangeable part as a named expression under the Expressions tab. Then go into the appropriate field and using the expression builder define the changeable bit in the dialogue box and your named expression will be there under user variables [You might have to scroll down] to use within this smaller expression.

HINT #2 – Calculate MCAF 'on the fly' without reblocking

The calculation of MCAFS (mining cost adjustment factors) that vary with depth has been traditionally defined either in the exported block model or during a special reblocking run. This make 'what if' and sensitivity runs more complex [if you wanted to change the cost ratios a new model would have to be created].

You can however use expression to calculate these MCAF on the fly. If you look under the Mining tab on the Pit Shells node you will see that you can use rock-type mining CAFs and they have the little *fx* symbol to show you can use the expression builder to define a CAF for each rock type [The penalty? Optimisation and analysis are slower]

When you are using mining cost adjustment factors don't forget to tick the Optimize with Positional Mining CAFs box on the Optimization tab within the Pit Shells Node.

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