

The Lithology -> K program (Figure 1) converts a Lithology model to hydraulic conductivity models.

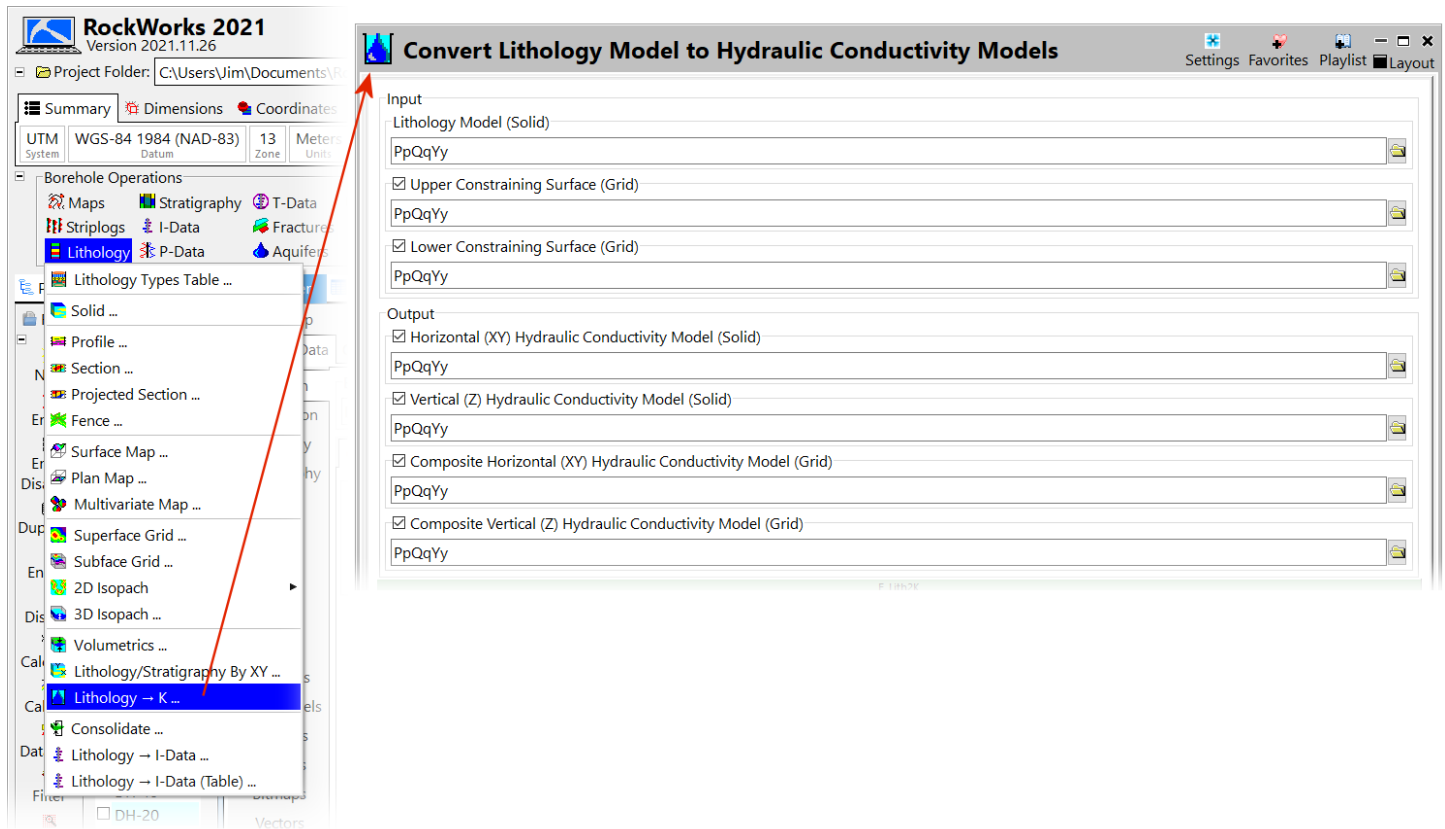


Figure 1

This conversion uses horizontal and vertical lithology hydraulic conductivity values assigned within the Lithology Types table (Figure 2) to convert lithology g-values to k-values. For example, if a voxel with a value of 5.0 (gravel) is encountered within the input lithology model, the voxel within the horizontal hydraulic conductivity model will be assigned a value of 30.0 while the voxel within the vertical hydraulic conductivity model will be assigned a value of 20.0.

Lithology Type							
Density Units: Grams Per Cubic Centimeter							
G-Value	Keyword	Pattern	Fill Percent	Density	Show in Legend	HK	VK
2.0	Clay	[Pattern]	100	2.2	<input checked="" type="checkbox"/>	0.1	0.02
5.0	Gravel	[Pattern]	100	2.8	<input checked="" type="checkbox"/>	30.0	20.0
9.0	Igimbrite	[Pattern]	100	2.5	<input checked="" type="checkbox"/>	0.05	0.01
6.0	Mudstone	[Pattern]	100	2.6	<input checked="" type="checkbox"/>	0.2	0.01
8.0	Rhyolite	[Pattern]	100	2.1	<input checked="" type="checkbox"/>	0.0	0.0
4.0	Sand	[Pattern]	100	2.7	<input checked="" type="checkbox"/>	20.0	15.0
3.0	Silt	[Pattern]	100	2.1	<input checked="" type="checkbox"/>	10.0	5.0
7.0	Siltstone	[Pattern]	100	2.5	<input checked="" type="checkbox"/>	9.0	4.0
1.0	Soil	[Pattern]	100	2.6	<input checked="" type="checkbox"/>	50.0	40.0

Figure 2

All voxels within the output solids above the upper constraining surface (if checked) will be assigned to a null (-1.0e27) value while all values below the lower constraining surface (if checked) will also be assigned to a null value.

The composite grids nodes values are based on a average of all of the voxels within the corresponding cell. Given that the voxels must be uniformly dimensioned this is effectively a thickness-weighted average. If either of the constraining grids are used, the thickness-weighted average is adjusted accordingly to accommodate truncated voxels.

Caveats

- This approach assumes that the horizontal and vertical hydraulic conductivities for each lithology type are constant throughout the study area.
- If a user does not separate hydraulic conductivities into their horizontal and vertical components, they will need to only specify the HV value within the lithology types table and ignore the vertical options within this program.
- This program does not have any graphical output options (unless convinced otherwise) for two reasons;
 1. The menu loading time for the four separate output model display options would be unacceptable.
 2. It is assumed that the users of this program will be creating multiple hydrostratigraphic layers within the Playlist.