

## SOILVISION 10 Help Manual - 12/16/2019

## Hydraulic Conductivity Estimation



The unsaturated hydraulic conductivity curve is required for any unsaturated seepage analysis. A saturated hydraulic conductivity is all that is required for a saturated analysis.


### Estimate the Saturated Hydraulic Conductivity

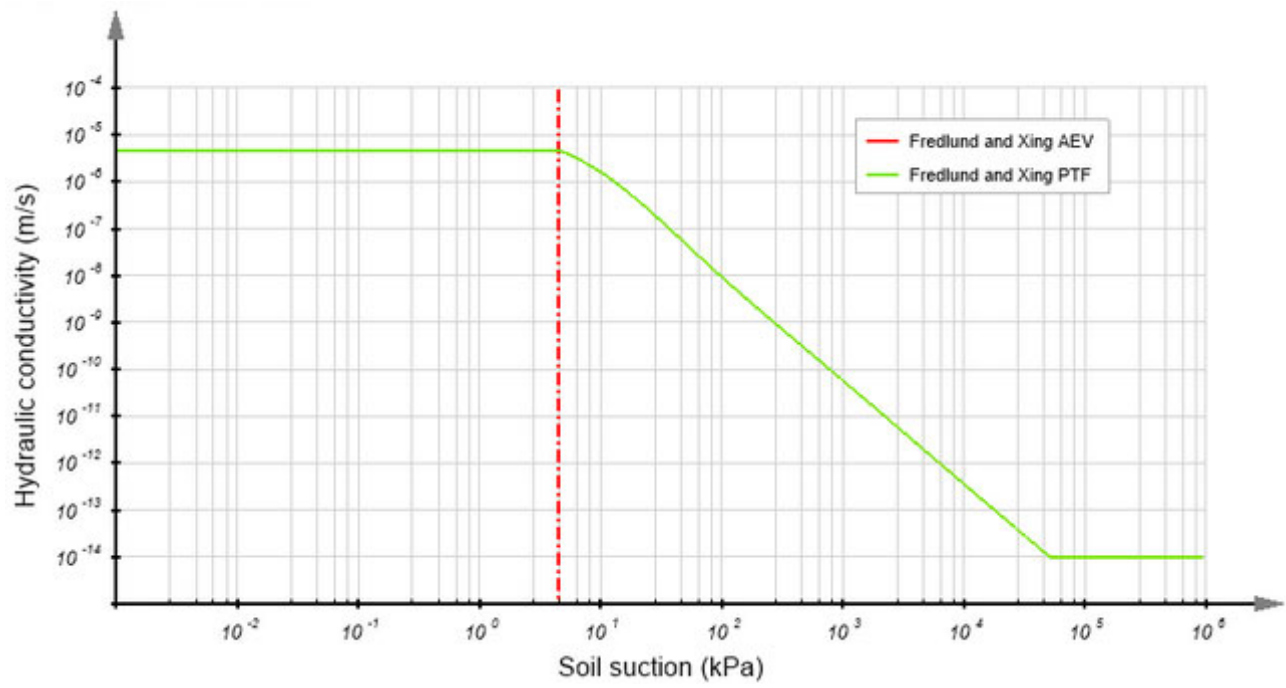
SVSOILS implements a comprehensive range of methods for the estimation of the saturated coefficient of permeability. It is important to note the requirements for the estimation methods. The majority of methods require a description of the grain-size distribution or %clay, %silt and, %sand as a minimum requirement. Once the prerequisites are fulfilled, the user can proceed with performing the estimations. The various estimation techniques can be initiated under the Permeability dialog. Once the estimation has been successfully performed, a saturated permeability will be placed in the appropriate field. If the estimation is not performed, it is often because required information is not present. For the most part, SVSOILS will indicate to the user what information is missing in the error message. Follow the steps below to estimate Saturated Hydraulic Conductivity:

1. Select the **Hydraulic Conductivity** button to open Hydraulic Conductivity dialog,
2. Select **Hazen's  $ksat$**  in the *ksat Options* section,
3. Input 3 in Hazen's constant,
4. The *ksat* value calculated is **9.86e-6 m/s** and is shown under the *Constant ksat*.

### Estimate the Unsaturated Hydraulic Conductivity

An estimation of the unsaturated hydraulic conductivity can be accomplished by first clicking on the desired estimation method. If the estimation is not performed, it is often because required information is not present. For the most part SVSOILS will indicate to the user what information is missing in the form of an error message. This tutorial outlines the estimation of unsaturated hydraulic conductivity using the Fredlund-Xing-Huang method.

1. Follow the SWCC estimation steps for the **Fredlund and Xing Fit** method using laboratory data in the [previous topic](#), then close the Drying SWCC dialog,
2. In the Hydraulic Conductivity, Select **Fredlund, Xing and Huang Estimation** from the Permeability Method drop list in the *Unsaturated Hydraulic Conductivity* section,
3. Click the graph icon  to display graph - the graph should look like the image below,
4. Close the graph then click **OK** to close dialog.



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