AIRSLUG

Model Uses   A conceptual model used for assessing the capabilities of aquifers for storing and transmitting water by presenting the resulting values in plotted curves.

Major Categories   Hydrology and Water Use

Minor Categories   Aquifers

Model Type   Data Analysis Package

Geographic in Nature?
No

Abstract

Airslug is a Fortran program developed by the USGS to generate type curves that allow the user to interpret the data generated from air-pressurized slug tests. Air-pressurized slug tests offer an efficient means of estimating the ability for an aquifer to both store and transmit water – these functions are known as 'transmissivity' (T) and 'storativity' (S). Type curves generated from these tests (via the Shapiro and Greene (1995) methods) can be used to estimate the T and S values based on data for the rising water levels.

Air-pressurized slug tests are conducted by pressurizing the air in the casing above the column of water in a well, while monitoring the declining water level. Once a new equilibrium water level is reached (when the water stops declining under pressure), the pressure can be released and sensors can be used to monitor the rising water level.   The combination of these two values will allow you to calculate the T and S values for the well.

Future Developments
Unknown

Model Limitations
Unknown

Model Features

Model uses a standard command line interface and requests user inputs based on collected values.

Required Data Types

The AIRSLUG application is completely interactive and requires no data sets. The program prompts the user for the needed data input. The user will need to supply input in response to prompts for:

(1) DRDELT, which is the fraction of the maximum water-level change for the applied air-pressure,

(2) an output file name, and

(3) the number of type curves desired. If all nine type curves are selected, the program generates type curves for all nine values of alpha. If the user selects one type curve, then the user must enter their own value of alpha.

Model Outputs

Model outputs are stored in a file named by the user. The user can then generate plots of the type curves using external software plotting packages in addition to AIRSLUG.

The values defining the type curves are in 10 columns. The first column contains dimensionless times, at which the dimensionless drawdowns are evaluated. Columns 2 through 10 contain dimensionless drawdowns for the dimensionless times given in the first column; each column corresponds to a type curve for a different value of alpha, alpha = 1.0E-1, 1.0E-2, ... 1.0E-9.

The user of AIRSLUG alternatively can specify that a single type curve be generated for a specific value of alpha. In this case, the program will generate values for only one type curve and store them in a file prescribed by the user. The values defining the type curve will be stored in 2 columns; the first column contains the dimensionless time and the second column contains the dimensionless water levels for the specified value of alpha.

Source
US Geological Survey

Source (URL)
http://water.usgs.gov/software/airslug.html

Hardware Requirements
AIRSLUG was written in Fortran 77 and generally installs easily on most computer systems. The code has been used on UNIX-based computers and DOS-based 386 or greater computers having a math coprocessor and 4mb of memory.

Supported Platforms

DOS	☒	**UNIX**	☒
Windows	☐	**Macintosh**	☐

Software Requirements
No additional software is required.

Cost, Licensing and Availability
Model is offered free of charge from USGS through the link provided above.