

## Further information

Downloads (from our website - [www.WaterraUK.com/pages/general/resources.asp](http://www.WaterraUK.com/pages/general/resources.asp))

PR30 - Waterra 3-part well slugs  
TM13 - 3-part well slugs user guide

### British Standards (Methodology)

BS 5930:1999 Code of practice for site investigations.  
BS ISO 14686:2003 Hydrometric determinations. Pumping tests for water wells. Considerations and guidelines for design, performance and use.

### Technical Paper

Black, J.H. 2010. The practical reasons why slug tests (including falling and rising head tests) often yield the wrong value of hydraulic conductivity. QJEGH Vol 43, 345-358.

## Ordering information

Code Description

### Well slugs - 3 part Delrin

**SLG-50** 3 part calibrated slug (36mm dia x 1929mm)  
**SLG-100** 3 part calibrated slug (80mm dia x 1563mm)



### Lifting cord and reel

**ERL-110** Hand reel with removable spool (holds 100m of 3.5mm cord)  
**BC/K35** Lifting Cord - 3.5mm diam polyester cord (50m or 300m)  
**KC2-100** Kevlar cord (100m x 2mm - spooled)



For dip tapes and loggers see website

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Our policy is to continuously review and update product design, therefore some details may differ from the actual product sold.

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**waterra**



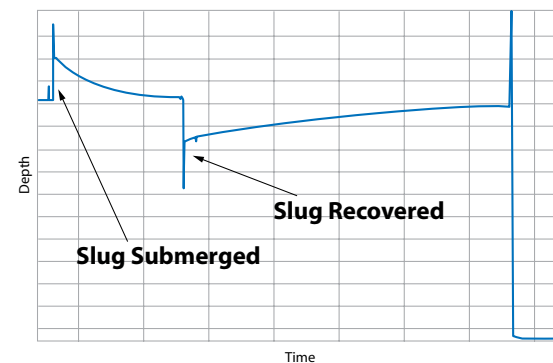
**SLG-100**  
(for 100mm diameter boreholes)

**SLG-50**  
(for 50mm diameter boreholes)

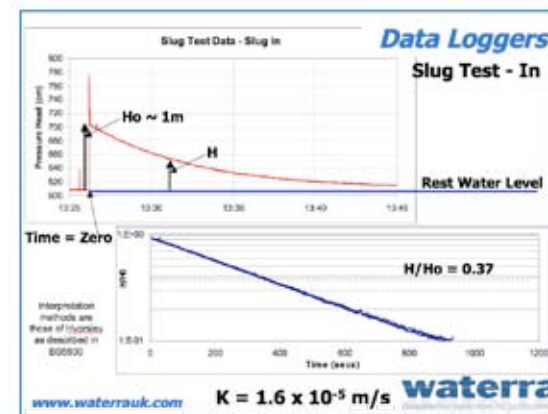
**waterra**

Groundwater equipment for professionals

## 3 part well slugs User guide



Data logger screen showing data collected during slug tests



Interpretation of results from a falling head slug test

## Introduction

This guide is designed to help you through the initial set-up and use of Waterra 3-part well slugs. Please read through these instructions carefully to get the best results.

## Safety Information

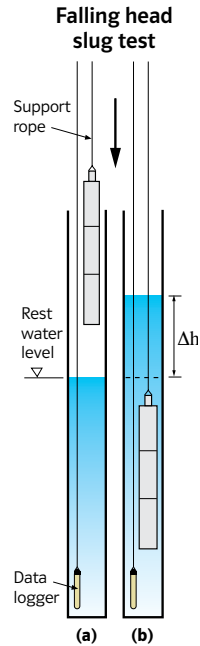
- We recommend that slug tests are always carried out by 2 people.
- The SLG-100 slug is very heavy (11.1 kg when all 3 sections are used) and should be secured on a good quality rope which can be gripped easily by hand. This slug should ALWAYS be raised and lowered by at least 2 people.

## Test Application

Please note that the slug test described below and the displacement depths stated in this document are based on the scenario where the water level during the test remains above the screened section of the borehole. Please refer to standard texts and/or a hydrogeologist for modifications to the test procedure as necessary.

## Using 3-part well slugs in monitoring boreholes

1. Measure the depth to water level and depth to borehole.
2. Depending on the available submergence depth, use 1, 2, or 3 parts of the slug. Thread together.
3. Securely tie or clip the suspension rope (or cord or cable) to the tether point on the top of the slug.
4. Measure out and make a mark on the suspension rope corresponding to the required depth of the slug. This allows the slug to be quickly positioned just above the water level before starting the test - i.e. at position (a).
5. Measure and make a second mark on the suspension rope corresponding to the lowest depth of the slug after submergence - i.e. at position (b).
6. If used, programme and install a data logger to its required depth - at least 0.5 metres deeper than the second position of the slug to avoid damage.



## Falling Head Test

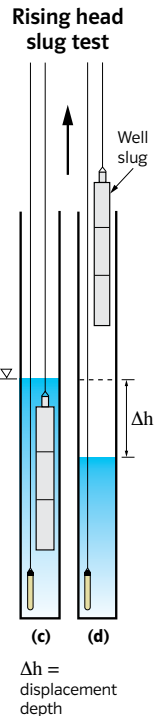
7. Lower the slug to its first marked position (a). Check the water level with a dip tape and then leave the dip tape probe suspended in the borehole at a position above the expected displacement depth.
8. Drop slug as quickly as possible to its second marked position (b) and secure at surface. Simultaneously record the starting time and / or start a stopwatch.
9. Record water levels at sufficiently frequent intervals to describe the rate of recovery of water level from its maximum displacement position back to its rest level. If full recovery is not achieved, record until at least 70% recovery has occurred.

**TIP** In higher permeability formations full recovery can be within seconds and data loggers are essential for recording water levels. In lower permeability formations the test can take many hours and a dip tape can be used for level measurements.

## Rising Head Test

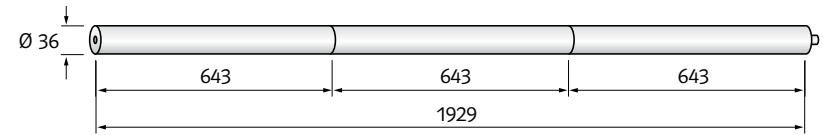
10. Once the water level has re-established itself (c), pull the slug out of the water column as rapidly as possible up to the first mark on the suspension rope (d) and secure at surface. Simultaneously record the starting time and / or start a stopwatch.
11. Record time and water levels as (9) until sufficient recovery is achieved.
12. Remove all equipment from borehole after use.

**TIP** Take care not to entangle and move cables, particularly when using data loggers in the borehole.



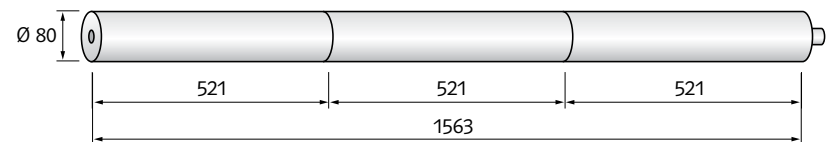
## Technical details

### SLG-50



<b>Material</b>	Delrin Acetal Thermoplastic				
<b>Weight (3-parts)</b>	2.7 kg				
<b>Displacement volume (3-parts)</b>	1.963 litres				
<b>Depth of displaced water (mm)</b>					
<i>Borehole inside diameter (mm)</i>	<b>50</b>	<b>55</b>	<b>60</b>	<b>75</b>	<b>100</b>
1 part slug	<b>330</b>	280	230	150	80
2 part slug	<b>670</b>	550	460	300	170
3 part slug	<b>1000</b>	830	690	440	250

### SLG-100



<b>Material</b>	Delrin Acetal Thermoplastic				
<b>Weight (3-parts)</b>	11.1 kg				
<b>Displacement volume (3-parts)</b>	7.86 litres				
<b>Depth of displaced water (mm)</b>					
<i>Borehole inside diameter (mm)</i>	<b>95</b>	<b>100</b>	<b>110</b>	<b>125</b>	<b>150</b>
1 part slug	370	<b>330</b>	280	210	150
2 part slug	740	<b>670</b>	550	430	300
3 part slug	1110	<b>1000</b>	830	640	440