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Forsmark site investigation

Single-hole injection tests in borehole KFM09B

Elin Gustavsson, Jan-Erik Ludvigson,
Kristoffer Gokall-Norman
Geosigma AB

August 2006

Svensk Kärnbränslehantering AB
Swedish Nuclear Fuel
and Waste Management Co
Box 5864
SE-102 40 Stockholm Sweden
Tel 08-459 84 00
+46 8 459 84 00
Fax 08-661 57 19
+46 8 661 57 19

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Abstract

Borehole KFM09B is a deep core-drilled borehole within the site investigations in the Forsmark area. The borehole is inclined, c 55 degrees from the horizontal plane, about 600 m long and was, after performance of the initial hydraulic injection tests presented in this report, grouted to about 55 m along the borehole. The borehole diameter is 77.3 mm.

This report presents injection tests performed using the pipe string system PSS3 in borehole KFM09B and the test results.

The main aim of the injection tests in KFM09B was to characterize the hydraulic conditions of the rock adjacent to the borehole on different measurement scales (100 m, 20 m and 5 m). Hydraulic parameters such as transmissivity and hydraulic conductivity were determined using analysis methods for stationary as well as transient conditions together with the dominating flow regime and possible outer hydraulic boundaries.

The injection tests gave consistent results on the different measurement scales regarding transmissivity. During most of the tests, some period with pseudo-radial flow could be identified from the injection period, making a relatively straight-forward transient evaluation possible. During the recovery period, pseudo-linear flow could often be identified, which makes a transient evaluation possible. The recovery period in KFM09B was however often affected by wellbore storage, which is making a transient evaluation of this period more difficult. The sections 15.5–23.0 m and 49.0–57.75 m, contribute the most to the total transmissivity in KFM09B.

The injection tests provide a database for statistical analysis of the hydraulic conductivity distribution along the borehole on the different measurement scales. Basic statistical parameters are presented in this report.

Sammanfattning

Borrhål KFM09B är ett djupt kärnborrhål borrat inom ramen för platsundersökningarna i Forsmarksområdet. Borrhålet är ca 600 m långt och lutar ca 55 grader från horisontalplanet. Efter att de inledande hydrauliska injektionstesterna, som presenteras i denna rapport, avslutats har borrhålet även injekterats till ca 55 m längs borrhålet. Borrhålsdiametern är 77,3 mm.

Denna rapport beskriver genomförda injektionstester med rörgångssystemet PSS3 i borrhål KFM09B samt resultaten från injektionstesterna.

Huvudsyftet med injektionstesterna var att karaktärisera de hydrauliska förhållandena i berget i anslutning till borrhålet i olika mätskalor (100 m, 20 m och 5 m). Hydrauliska parametrar såsom transmissivitet och hydraulisk konduktivitet tillsammans med dominerande flödes-regim och eventuella yttre hydrauliska randvillkor bestämdes med hjälp av analysmetoder för såväl stationära som transienta förhållanden.

Injektionstesterna gav samstämmiga resultat för de olika mätskalorna beträffande transmissivitet. Under de flesta tester kunde en viss period med pseudoradiellt flöde identifieras från flödesperioden, vilket möjliggjorde en standardmässig transient utvärdering. Under återhämtningsperioden i KFM09B kunde oftast en period med pseudolinjärt flöde identifieras, vilket också möjliggör en transient utvärdering, men återhämtningsperioden var vid några tillfällen starkt påverkad av brunnsmagasins-effekter, vilket gjorde en unik transient utvärdering av denna period svårare.

Sektionerna 15,5–23,0 m och 49,0–57,75 m bidrar mest till den totala transmissiviteten i KFM09B.

Resultaten från injektionstesterna utgör en databas för statistisk analys av den hydrauliska konduktivitetens fördelning längs borrhålet i de olika mätskalorna. Viss statistisk analys har utförts inom ramen för denna aktivitet och grundläggande statistiska parametrar presenteras i rapporten.

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1 Introduction

Injection tests were carried out in borehole KFM09B at Forsmark, Sweden, in November, 2005, and in February–March, 2006, by Geosigma AB. Borehole KFM09B is a deep, cored borehole within the on-going site investigation in the Forsmark area. The location of the borehole is shown in Figure 1-1. The borehole is about 600 m long and inclined c 55 degrees from the horizontal plane. From the top down to about 9 m a steelpipe with an inner diameter of 77.3 mm is installed. The borehole is core drilled from 9 m to the bottom with the diameter 77.3 m, which corresponds well to the inner diameter of the steelpipe. Due to large fractures in the borehole interval 0–55 m, this part was measured in November, 2005, and this interval was subsequently grouted. The interval 55–607 m was measured in February–March, 2006.

This document reports the results obtained from the injection tests in borehole KFM09B. The activity is performed within the Forsmark site investigation. The work was carried out in compliance with the SKB internal controlling documents presented in Table 1-1. Data and results were delivered to the SKB site characterization database, SICADA, where they are traceable by the Activity Plan number.

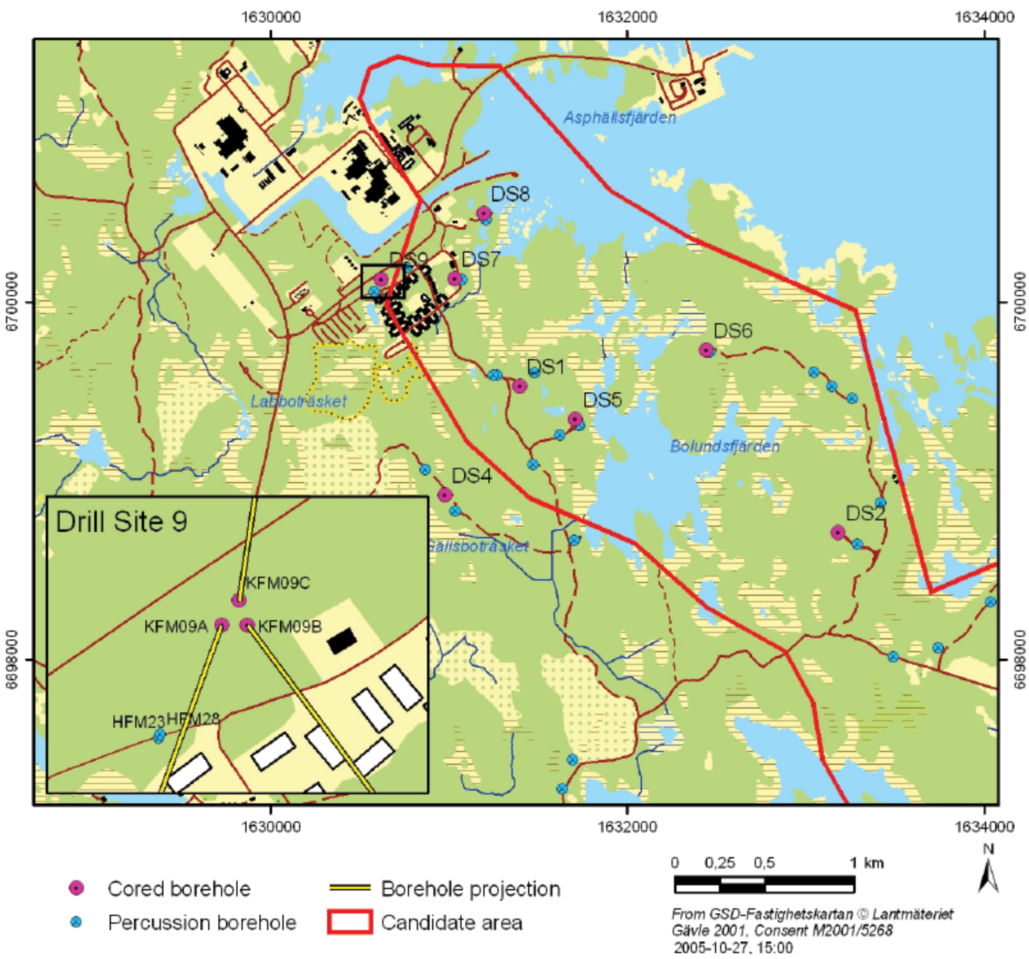

Figure 1-1. *The investigation area at Forsmark including the candidate area selected for more detailed investigations. Borehole KFM09B is situated at drill site DS9.*

Table 1-1. SKB internal controlling documents for performance of the activity.

Activity Plans	**Number**	**Version**
Hydraulic injection tests in borehole KFM09B with PSS3	AP PF 400-06-003	1.0
Method descriptions	**Number**	**Version**
Mätsystembeskrivning (MSB) – Allmän del. Pipe String System (PSS3)	SKB MD 345.100	1.0
Mätsystembeskrivning för: Kalibrering, PSS3	SKB MD 345.122	1.0
Mätsystembeskrivning för: Skötsel, service, serviceprotokoll, PSS3	SKB MD 345.124	1.0
Metodbeskrivning för hydrauliska injektionstester	SKB MD 323.001	1.0
Instruktion för analys av injektions- och enhålspumptester	SKB MD 320.004	1.0
Instruktion för rengöring av borrhålsutrustning och viss markbaserad utrustning	SKB MD 600.004	1.0

2 Objectives

The main aim of the injection tests in borehole KFM09B was to characterize the hydraulic properties of the rock adjacent to the borehole on different measurement scales (100 m, 20 m and 5 m). The primary parameter to be determined was hydraulic transmissivity from which hydraulic conductivity can be derived. The results of the injection tests provide a database which can be used for statistical analyses of the hydraulic conductivity distribution along the borehole on different measurement scales. Basic statistical analyses are presented in this report.

Other hydraulic parameters of interest were flow regimes and outer hydraulic boundaries. These parameters were analysed using transient evaluation on the test responses during the flow- and recovery periods.

3 Scope

3.1 Borehole data

Technical data of the tested boreholes are shown in Table 3-1 and in Appendix 4. The reference point of the boreholes is defined as the centre of top of casing (ToC), given as "Elevation" in the table below. The Swedish National coordinate system (RT90) is used for the horizontal coordinates together with RHB70 for the elevation. "Northing" and "Easting" refer to the top of the boreholes.

3.2 Tests performed

The injection tests in borehole KFM09B, performed according to Activity Plan AP PF 400-06-003 (see Table 1-1), are listed in Table 3-2. The injection tests were carried out with the Pipe String System (PSS3). The test procedure and the equipment is described in the measurement system description for PSS (SKB MD 345.100) and in the corresponding method descriptions for hydraulic injection tests (SKB MD 323.001, Table 1-1).

Some of the tests were not performed as intended because the time required for achieving a constant head in the test section was judged to be too long or, in other cases, equipment malfunctions caused pressure and/or flow rate disturbances. Whenever such disturbances were expected to affect data evaluation, the test was repeated. Test number (Test no in Table 3-2) refers to the number of tests performed in the actual section. For evaluation, only data from the last test in each section were used.

Table 3-1. Pertinent technical data of borehole KFM09B (printout from SKB database, SICADA).

Borehole length (m):	**616.45**				
Drilling period(s):	**From date**	**To date**	**Secup (m)**	**Seclow (m)**	**Drilling type**
	2005-11-15	2005-11-15	0.000	9.120	Percussion drilling
	2005-11-16	2005-12-19	9.120	616.450	Core drilling
Starting point coordinate:	**Length (m)**	**Northing (m)**	**Easting (m)**	**Elevation**	**Coord system**
	0.000	6700119.887	1630638.784	4.303	RT90-RHB70
Angles:	**Length (m)**	**Bearing**	**Inclination (– = down)**		
	0.000	140.834	–55.081		
Borehole diameter:	**Secup (m)**	**Seclow (m)**	**Hole diam (m)**		
	0.000	9.120	0.151		
	9.120	616.450	0.0773		
Core diameter:	**Secup (m)**	**Seclow (m)**	**Core diam (m)**		
	9.120	9.120	0.077		
Casing diameter:	**Secup (m)**	**Seclow (m)**	**Case in (m)**	**Case out (m)**	
	0.000	9.120	0.0773	0.090	

Table 3-2. Single-hole injection tests performed in borehole KFM09B.

Borehole Bh ID	Test section secup	seclow	Section length	Test type[1] (1–6)	Test no	Test start date, time YYYYMMDD hh:mm	Test stop date, time YYYYMMDD hh:mm
KFM09B	55.00	155.00	100.00	3	1	2006-02-09 14:28	2006-02-09 16:28
KFM09B	155.00	255.00	100.00	3	1	2006-02-10 07:19	2006-02-10 09:07
KFM09B	255.00	355.00	100.00	3	3	2006-02-10 11:13	2006-02-10 13:01
KFM09B	355.00	455.00	100.00	3	1	2006-02-10 13:47	2006-02-10 15:35
KFM09B	455.00	555.00	100.00	3	1	2006-02-13 09:33	2006-02-13 11:23
KFM09B	507.00	607.00	100.00	3	2	2006-02-13 14:06	2006-02-13 15:58
KFM09B	55.00	75.00	20.00	3	1	2006-02-15 13:24	2006-02-15 15:07
KFM09B	75.00	95.00	20.00	3	1	2006-02-15 15:33	2006-02-15 16:52
KFM09B	95.00	115.00	20.00	3	1	2006-02-15 17:22	2006-02-15 18:39
KFM09B	115.00	135.00	20.00	3	1	2006-02-16 07:23	2006-02-16 08:41
KFM09B	135.00	155.00	20.00	3	1	2006-02-16 09:03	2006-02-16 10:20
KFM09B	155.00	175.00	20.00	3	1	2006-02-16 10:38	2006-02-16 11:58
KFM09B	175.00	195.00	20.00	3	1	2006-02-16 12:48	2006-02-16 14:07
KFM09B	195.00	215.00	20.00	3	1	2006-02-16 14:33	2006-02-16 15:28
KFM09B	215.00	235.00	20.00	3	1	2006-02-16 16:02	2006-02-16 17:24
KFM09B	235.00	255.00	20.00	3	1	2006-02-17 08:34	2006-01-17 09:54
KFM09B	255.00	275.00	20.00	3	1	2006-02-17 10:18	2006-02-17 11:39
KFM09B	275.00	295.00	20.00	3	1	2006-02-17 12:39	2006-02-17 13:58
KFM09B	295.00	315.00	20.00	3	1	2006-02-17 14:20	2006-02-17 15:37
KFM09B	315.00	335.00	20.00	3	1	2006-02-17 16:02	2006-02-17 17:17
KFM09B	335.00	355.00	20.00	3	1	2006-02-21 10:56	2006-02-21 12:27
KFM09B	355.00	375.00	20.00	3	1	2006-02-21 12:45	2006-02-21 14:02
KFM09B	375.00	395.00	20.00	3	1	2006-02-21 14:24	2006-02-21 15:47
KFM09B	395.00	415.00	20.00	3	1	2006-02-21 16:09	2006-02-21 17:26
KFM09B	415.00	435.00	20.00	3	1	2006-02-22 08:52	2006-02-22 09:35
KFM09B	435.00	455.00	20.00	3	1	2006-02-22 10:03	2006-02-22 10:48
KFM09B	455.00	475.00	20.00	3	1	2006-02-22 11:06	2006-02-22 13:12
KFM09B	475.00	495.00	20.00	3	1	2006-02-22 13:30	2006-02-22 14:50
KFM09B	495.00	515.00	20.00	3	1	2006-02-22 15:14	2006-02-22 15:57
KFM09B	505.00	525.00	20.00	3	1	2006-02-22 16:12	2006-02-22 16:59
KFM09B	515.00	535.00	20.00	3	1	2006-02-23 08:37	2006-02-23 09:55
KFM09B	525.50	545.50	20.00	3	1	2006-02-23 10:10	2006-02-23 11:25
KFM09B	535.00	555.00	20.00	3	1	2006-02-23 11:42	2006-02-23 13:03
KFM09B	545.50	565.50	20.00	3	1	2006-02-23 13:24	2006-02-23 14:12
KFM09B	565.50	585.50	20.00	3	1	2006-02-23 14:29	2006-02-23 15:47
KFM09B	585.50	605.50	20.00	3	1	2006-02-23 16:09	2006-02-23 16:50
KFM09B	10.50	15.50	5.00	3	1	2005-11-23 13:55	2005-11-23 15:41
KFM09B	15.50	20.50	5.00	3	1	2005-11-25 14:49	2005-11-25 16:18
KFM09B	18.00	23.00	5.00	3	1	2005-11-25 12:55	2005-11-25 14:22
KFM09B	21.30	26.30	5.00	3	1	2005-11-25 10:24	2005-11-25 11:49
KFM09B	24.00	29.00	5.00	3	1	2005-11-23 18:10	2005-11-23 19:39
KFM09B	29.00	34.00	5.00	3	1	2005-11-23 20:38	2005-11-23 22:16
KFM09B	34.00	39.00	5.00	3	1	2005-11-23 22:58	2005-11-24 00:17
KFM09B	39.00	44.00	5.00	3	1	2005-11-24 09:12	2005-11-24 10:30
KFM09B	44.00	49.00	5.00	3	1	2005-11-24 11:04	2005-11-24 12:53
KFM09B	49.00	54.00	5.00	3	1	2005-11-24 13:25	2005-11-24 14:41

Borehole Bh ID	Test section secup	 seclow	Section length	Test type[1)] (1–6)	Test no	Test start date, time YYYYMMDD hh:mm	Test stop date, time YYYYMMDD hh:mm
KFM09B	52.75	57.75	5.00	3	1	2005-11-24 15:53	2005-11-24 17:11
KFM09B	55.00	60.00	5.00	3	2	2006-03-13 14:47	2006-03-13 16:02
KFM09B	60.00	65.00	5.00	3	1	2006-02-27 10:38	2006-02-27 11:54
KFM09B	65.00	70.00	5.00	3	1	2006-02-27 12:31	2006-02-27 13:48
KFM09B	70.00	75.00	5.00	3	1	2006-02-27 13:58	2006-02-27 15:14
KFM09B	75.00	80.00	5.00	3	1	2006-02-27 15:26	2006-02-27 16:42
KFM09B	80.00	85.00	5.00	3	1	2006-02-28 08:10	2006-02-28 09:24
KFM09B	85.00	90.00	5.00	3	1	2006-02-28 09:34	2006-02-28 10:50
KFM09B	90.00	95.00	5.00	3	1	2006-02-28 11:02	2006-02-28 12:17
KFM09B	95.00	100.00	5.00	3	1	2006-02-28 12:55	2006-02-28 14:09
KFM09B	100.00	105.00	5.00	3	1	2006-02-28 14:18	2006-02-28 15:32
KFM09B	105.00	110.00	5.00	3	1	2006-02-28 15:43	2006-02-28 16:58
KFM09B	110.00	115.00	5.00	3	1	2006-03-01 08:05	2006-03-01 09:22
KFM09B	115.00	120.00	5.00	3	1	2006-03-01 09:36	2006-03-01 10:50
KFM09B	120.00	125.00	5.00	3	1	2006-03-01 11:02	2006-03-01 11:59
KFM09B	125.00	130.00	5.00	3	1	2006-03-01 12:10	2006-03-01 13:24
KFM09B	130.00	135.00	5.00	3	1	2006-03-01 13:34	2006-03-01 14:52
KFM09B	135.00	140.00	5.00	3	1	2006-03-01 15:05	2006-03-01 16:22
KFM09B	140.00	145.00	5.00	3	1	2006-03-02 07:52	2006-03-02 09:06
KFM09B	145.00	150.00	5.00	3	1	2006-03-02 09:18	2006-03-02 10:32
KFM09B	150.00	155.00	5.00	3	1	2006-03-02 10:59	2006-03-02 11:45
KFM09B	155.00	160.00	5.00	3	1	2006-03-02 11:54	2006-03-02 13:08
KFM09B	160.00	165.00	5.00	3	2	2006-03-13 12:45	2006-03-13 14:04
KFM09B	165.00	170.00	5.00	3	1	2006-03-02 14:08	2006-03-02 15:25
KFM09B	170.00	175.00	5.00	3	1	2006-03-03 07:47	2006-03-03 08:31
KFM09B	175.00	180.00	5.00	3	1	2006-03-03 08:56	2006-03-03 09:44
KFM09B	180.00	185.00	5.00	3	1	2006-03-03 09:57	2006-03-03 11:13
KFM09B	185.00	190.00	5.00	3	1	2006-03-03 11:28	2006-03-03 13:26
KFM09B	190.00	195.00	5.00	3	1	2006-03-03 13:39	2006-03-03 14:55
KFM09B	215.00	220.00	5.00	3	2	2006-03-13 10:12	2006-03-13 11:35
KFM09B	220.00	225.00	5.00	3	1	2006-03-06 08:24	2006-03-06 09:42
KFM09B	225.00	230.00	5.00	3	1	2006-03-06 09:53	2006-03-06 10:40
KFM09B	230.00	235.00	5.00	3	1	2006-03-06 10:49	2006-03-06 12:52
KFM09B	235.00	240.00	5.00	3	1	2006-03-06 13:01	2006-03-06 14:21
KFM09B	240.00	245.00	5.00	3	1	2006-03-06 14:32	2006-03-06 15:50
KFM09B	245.00	250.00	5.00	3	1	2006-03-06 16:06	2006-03-06 17:02
KFM09B	250.00	255.00	5.00	3	1	2006-03-07 08:40	2006-03-07 09:59
KFM09B	275.00	280.00	5.00	3	1	2006-03-07 10:33	2006-03-07 11:51
KFM09B	280.00	285.00	5.00	3	1	2006-03-07 12:50	2006-03-07 14:05
KFM09B	285.00	290.00	5.00	3	1	2006-03-07 14:20	2006-03-07 15:20
KFM09B	290.00	295.00	5.00	3	1	2006-03-07 15:32	2006-03-07 16:17
KFM09B	373.00	378.00	5.00	3	1	2006-03-08 08:14	2006-03-08 08:57
KFM09B	378.00	383.00	5.00	3	1	2006-03-08 09:11	2006-03-08 10:28
KFM09B	383.00	388.00	5.00	3	1	2006-03-08 10:42	2006-03-08 11:58
KFM09B	388.00	393.00	5.00	3	1	2006-03-08 12:43	2006-03-08 13:24
KFM09B	393.00	398.00	5.00	3	1	2006-03-08 13:46	2006-03-08 14:28
KFM09B	475.00	480.00	5.00	3	1	2006-03-08 15:17	2006-03-08 16:33
KFM09B	480.00	485.00	5.00	3	1	2006-03-09 08:34	2006-03-09 09:25

Borehole Bh ID	Test section secup	seclow	Section length	Test type[1] (1–6)	Test no	Test start date, time YYYYMMDD hh:mm	Test stop date, time YYYYMMDD hh:mm
KFM09B	485.00	490.00	5.00	3	1	2006-03-09 09:42	2006-03-09 10:30
KFM09B	490.00	495.00	5.00	3	1	2006-03-09 10:43	2006-03-09 11:35
KFM09B	515.00	520.00	5.00	3	1	2006-03-09 12:05	2006-03-09 13:34
KFM09B	520.00	525.00	5.00	3	1	2006-03-09 13:48	2006-03-09 14:42
KFM09B	525.00	530.00	5.00	3	1	2006-03-09 14:56	2006-03-09 16:17
KFM09B	530.00	535.00	5.00	3	1	2006-03-09 16:41	2006-03-09 17:59
KFM09B	564.50	569.50	5.00	3	2	2006-03-10 14:19	2006-03-10 15:35
KFM09B	569.50	574.50	5.00	3	1	2006-03-10 09:45	2006-03-10 11:11
KFM09B	574.50	579.50	5.00	3	1	2006-03-10 11:24	2006-03-10 12:07
KFM09B	579.50	584.50	5.00	3	1	2006-03-10 12:17	2006-03-10 12:59
KFM09B	584.50	589.50	5.00	3	1	2006-03-10 13:17	2006-03-10 14:00

[1] 3: Injection test.

3.3 Equipment checks

The PSS3 equipment was fully serviced, according to SKB internal controlling documents (SKB MD 345.124, service, and SKB MD 345.122, calibration), in January 2006.

Functioning checks of the equipment were performed during the installation of the PSS equipment at the test site. In order to check the function of the pressure sensors, the air pressure was recorded and found to be as expected. While lowering, the sensors showed good agreement with the total head of water (p/ρg). The temperature sensor displayed expected values in the water.

Simple functioning checks of down-hole sensors were done at every change of test section interval. Checks were also made continuously while lowering the pipe string along the borehole.

4 Description of equipment

4.1 Overview

4.1.1 Measurement container

All of the equipment needed to perform the injection tests is located in a steel container (Figure 4-1). The container is divided into two compartments; a data-room and a workshop. The container is placed on pallets in order to obtain a suitable working level in relation to the borehole casing.

The hoisting rig is of a hydraulic chain-feed type. The jaws, holding the pipe string, are opened hydraulically and closed mechanically by springs. The rig is equipped with a load transmitter and the load limit may be adjusted. The maximum load is 22 kN.

The packers and the test valve are operated hydraulically by water filled pressure vessels. Expansion and release of packers, as well as opening and closing of the test valve, is done using magnetic valves controlled by the software in the data acquisition system.

The injection system consists of a tank, a pump and a flow meter. The injection flow rate may be manually or automatically controlled. At small flow rates, a water filled pressure vessel connected to a nitrogen gas regulator is used instead of the pump.

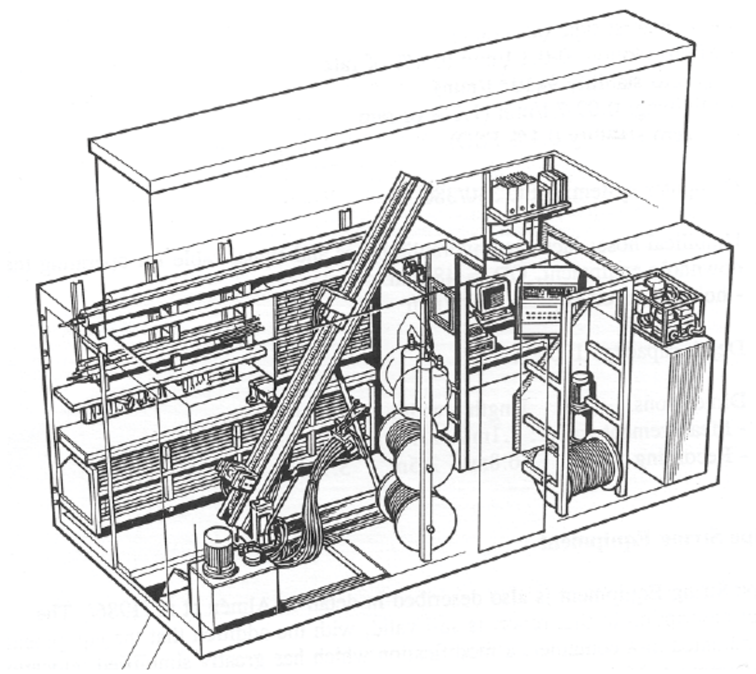

Figure 4-1. *Outline of the PSS3 container with equipment.*

4.1.2 Down-hole equipment

A schematic drawing of the down-hole equipment is shown in Figure 4-2. The pipe string consists of aluminium pipes of 3 m length, connected by stainless steel taps sealed with double o-rings. Pressure is measured above (P_a), within (P) and below (P_b) the test section, which is isolated by two packers. The groundwater temperature in the test section is also measured. The hydraulic connection between the pipe string and the test section can be closed or opened by a test valve operated by the measurement system.

At the lower end of the borehole equipment, a level indicator (calliper type) gives a signal as the reference depth marks along the borehole are passed.

The length of the test section may be varied (5, 20 or 100 m).

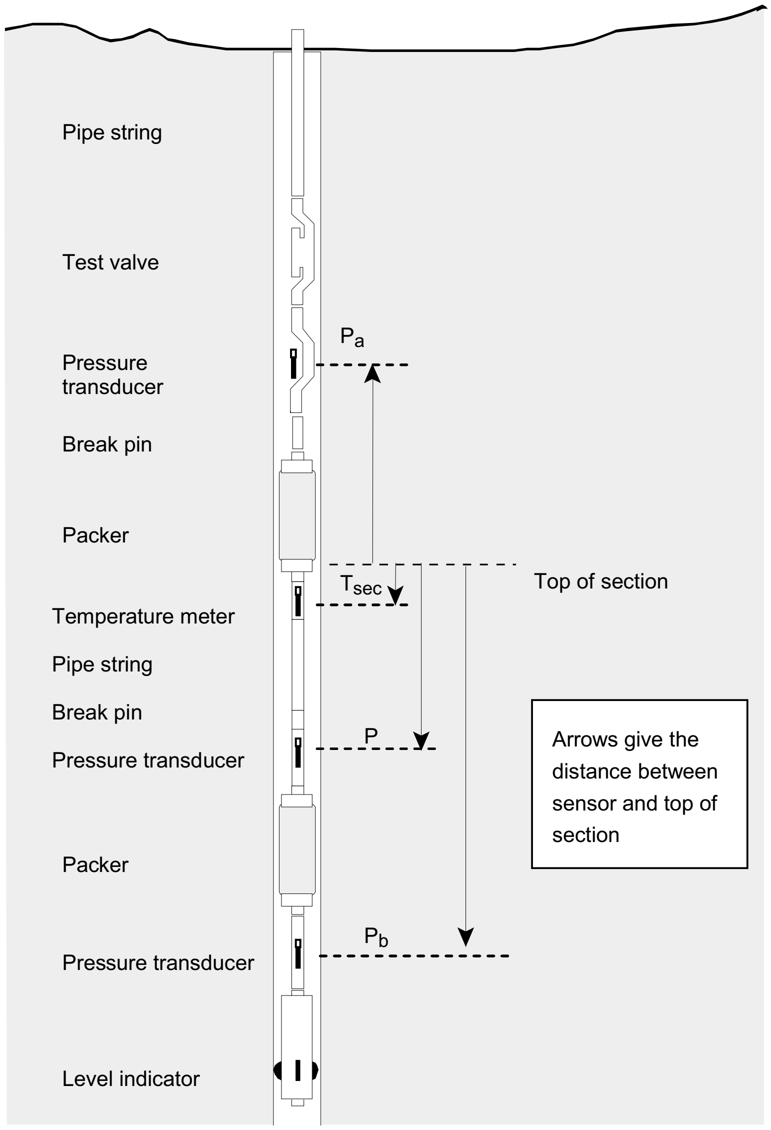

Figure 4-2. *Schematic drawing of the down-hole equipment in the PSS3 system.*

4.2 Measurement sensors

Technical data for the measurement sensors in the PSS system together with corresponding data of the system are shown in Table 4-1. The sensors are components of the PSS system. The accuracy of the PSS system may also be affected by the I/O-unit, cf Figure 4-3, and the calibration of the system.

The sensor positions are fixed relative to the top of the test section. In Table 4-2, the position of the sensors is given with top of test section as reference (Figure 4-2).

Table 4-1. Technical data for sensors together with estimated data for the PSS system (based on current experience).

Technical specification Parameter		Unit	Sensor	PSS	Comments
Absolute pressure	Output signal	mA	4–20		
	Meas. range	MPa	0–13.5		
	Resolution	kPa	< 1.0		
	Accuracy[1)]	% F.S	0.1		
Differential pressure, 200 kPa	Accuracy	kPa		< ± 5	Estimated value
Temperature	Output signal	mA	4–20		
	Meas. range	°C	0–32		
	Resolution	°C	< 0.01		
	Accuracy	°C	± 0.1		
Flow Qbig	Output signal	mA	4–20	< 1.5	
	Meas. range	m^3/s	$1.67 \cdot 10^{-5}$–$1.67 \cdot 10^{-3}$		The specific accuracy is depending on actual flow
	Resolution	m^3/s	$6.7 \cdot 10^{-8}$		
	Accuracy[2)]	% O.R	0.15–0.3		
Flow Qsmall	Output signal	mA	4–20	0.5–20	
	Meas. range	m^3/s	$1.67 \cdot 10^{-8}$–$1.67 \cdot 10^{-5}$		The specific accuracy is depending on actual flow
	Resolution	m^3/s	$6.7 \cdot 10^{-10}$		
	Accuracy[3)]	% O.R	0.1–0.4		

[1)] 0.1% of Full Scale. Includes hysteresis, linearity and repeatability.
[2)] Maximum error in % of actual reading (% o.r.).
[3)] Maximum error in % of actual reading (% o.r.). The higher numbers correspond to the lower flow.

Table 4-2. Position of sensors in the borehole and displacement volume of equipment in the test section in borehole KFM09B.

Parameter	Length of test section (m) 5 (L)	 (m)	 20 (L)	 (m)	 100 (L)	 (m)
Equipment displacement volume in test section [1)]	3.6		13		61	
Total volume of test section [2)]	23.5		93.9		469.3	
Position for sensor Pa, pressure above test section, (m above secup) [3)]		1.90		1.88		1.90
Position for sensor P, pressure in test section, (m above secup) [3)]		–4.12		–19.12		–99.10
Position for sensor Tsec, temperature in test section, (m above secup) [3)]		–0.97		–0.97		–0.99
Position for sensor Pb, pressure below test section, (m above secup) [3)]		–6.99		–21.99		–101.99

[1)] Displacement volume in test section due to pipe string, signal cable, sensors and packer ends (in litres).
[2)] Total volume of test section (V = section length*π*d2/4) (in litres).
[3)] Position of sensor relative top of test section. A negative value indicates a position below top of test section, (secup).

4.3 Data acquisition system

The data acquisition system in the PSS equipment contains a standard office PC connected to an I/O-unit (Datascan 7320). Using the Orchestrator software, pumping and injection tests are monitored and borehole sensor data are collected. In addition to the borehole parameters, packer and atmospheric pressure, container air temperature and water temperature are logged. Test evaluation may be performed on-site after a conducted test. An external display enables monitoring of test parameters.

The data acquisition system may be used to start and stop the automatic control system (computer and servo motors). These are connected as shown in Figure 4-3. The control system monitors the flow regulator and uses differential pressure across the regulating valve together with pressure in test section as input signals.

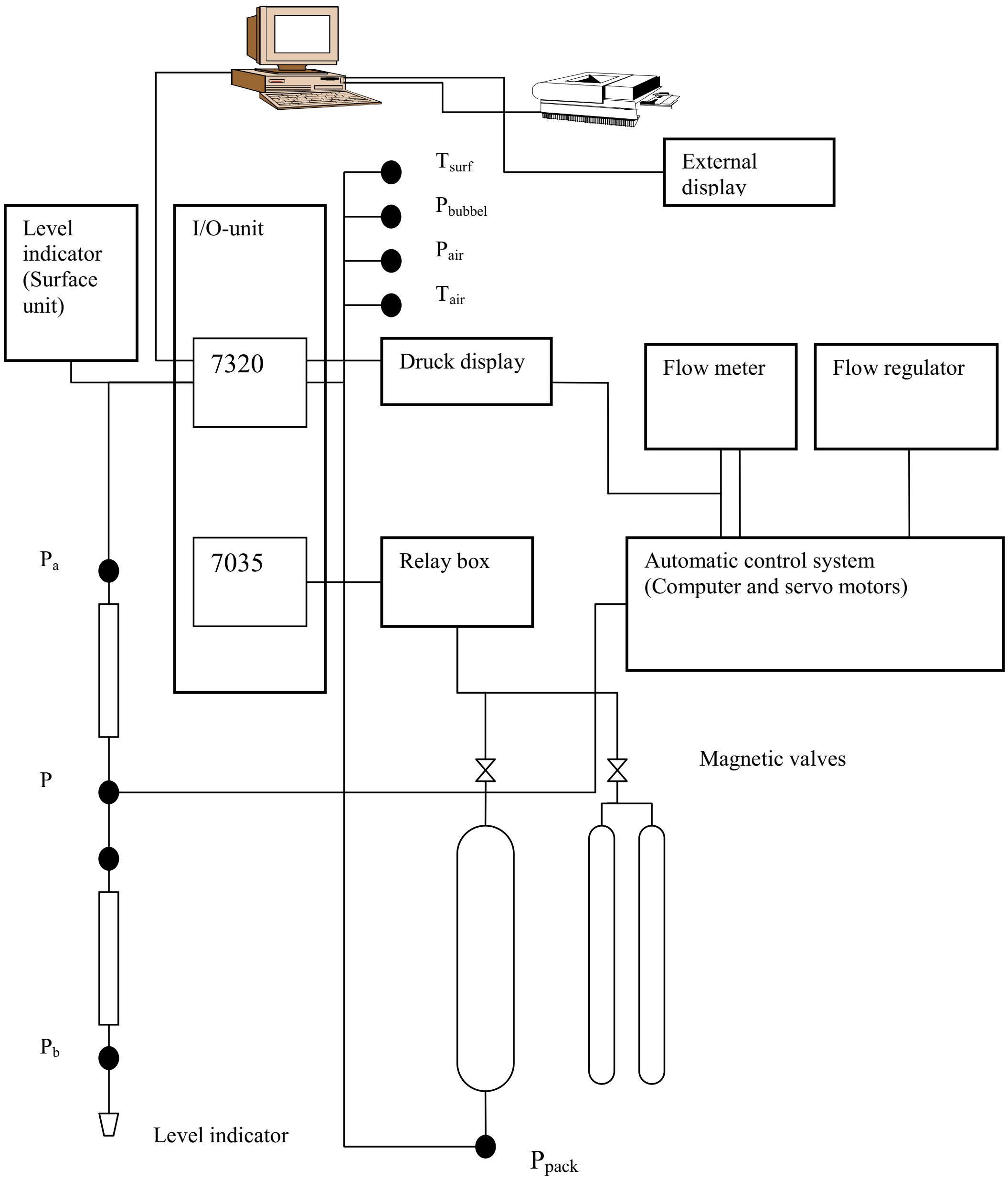

Figure 4-3. *Schematic drawing of the data acquisition system and the automatic control system in PSS.*

5 Execution

5.1 Preparation

5.1.1 Calibration

All sensors included in PSS are calibrated at the Geosigma engineering service station in Uppsala. Calibration is generally performed at least every year. Results from calibration, e.g. calibration constants, of sensors are kept in a document folder in PSS. If a sensor is replaced at the test site, calibration constants are altered as well. If a new, un-calibrated, sensor is to be used, calibration may be performed afterwards and data re-calculated.

5.1.2 Functioning checks

Equipment functioning checks were performed during the establishment of PSS at the test site. Simple function checks of down-hole sensors were done at every change of test section length, as well as while lowering the pipe string along the borehole.

5.1.3 Cleaning of equipment

Cleaning of the borehole equipment was performed according to the cleaning instruction SKB MD 600.004, see Table 1-1, level 1.

5.2 Test performance

5.2.1 Test principle

The injection tests in KFM09B were carried out while maintaining a constant head of generally 200 kPa (20 m) in the test section. Before start of the injection period, approximately steady-state pressure conditions prevailed in the test section. After the injection period, the pressure recovery was measured.

For injection tests with 20 m and 5 m section length, the injection phase was interrupted if the injection flow was clearly below the measurement limit. Thereafter, the recovery was measured for at least 5 minutes to verify the low conductivity of the section.

5.2.2 Test procedure

Generally, the tests were performed according to the Activity Plan AP PF 400-06-003. Exceptions to this are presented in Section 5.5.

A test cycle includes the following phases: 1) Transfer of down-hole equipment to the next section, 2) Packer inflation, 3) Pressure stabilisation, 4) Injection, 5) Pressure recovery and 6) Packer deflation.

The estimated times for the various phases are presented in Table 5-1. Regarding the packer inflation times and actual injection and recovery times, slightly different procedures were used for the tests in 100 m sections compared to the tests in 20 m and 5 m sections in accordance with AP PF 400-06-003. Furthermore, slightly longer test times were used for the tests in 100 m sections, cf Table 5-1.

5.2.3 Test strategy

Due to the presence of large fractures in the interval c 0–55 m in KFM09B, this part was firstly measured. Subsequently, this part of the borehole was grouted. The interval 10.5–57.75 m was measured in 5 m sections. Some of the sections were overlapping due to large fractures making it risky to expand the packers at the desired positions.

Secondly, injection tests in 100 m sections were performed within the interval 55.0–607.0 m. The lowest 100 m section was partly overlapping the 100 m section above.

Thirdly, injection tests in 20 m sections were carried out within nearly the same interval (55.0–605.5 m) since detectable flow was found in every 100 m test section. The 100 m sections were measured in five successive injection tests using 20 m section length. Due to large fractures or cavities in the borehole, there were seven 20 m sections measured within the interval 505.0–605.5 m instead of five 20 m sections within the interval 507.0–607.0 m. Five 20 m sections were partly overlapping because the two lowest 100 m sections were overlapping.

Finally, injection tests with 5 m section length were conducted in the 20 m sections which had a definable flow rate. These sections were 55.0–195.0 m, 215.0–255.0 m, 275.0–295.0 m, 373.0–398.0 m, 475.0–495.0 m, 515.0–535.0 m and 564.5–589.5 m. Four tests using 5 m section length were performed within the conductive 20 m intervals with a few exceptions due to major fractures making it risky to expand the packers at the desired positions.

Since the results of the tests in 100 m sections have a strong effect on the continued test program (i.e. whether a 100 m section would be measured with shorter sections as well), it was particularly important to ensure accurate results of these tests, including sections close to the lower measurement limit.

The total number of injection tests was thus dependent on the results of the previous tests.

Table 5-1. Packer inflation times, pressure stabilisation times and test times used for the injection tests in KFM09B.

Test section length (m)	Packer inflation time (min)	Time for pressure stabilisation (min)	Injection period (min)	Recovery period (min)	Total time/test (min)[1)]
100	30	15	30	30	105
20	25	5	20	20	70
5	25	5	20	20	70

[1)] Exclusive of trip times in the borehole.

5.3 Data handling

With the PSS system, primary data are handled using the Orchestrator software (Version 2.3.8). During a test, data are continuously logged in *.odl-files. After the test is finished, a report file (*.ht2) with space separated data is generated. The *.ht2-file (mio-format) contains logged parameters as well as test-specific information, such as calibration constants and background data. The parameters are presented as percentage of sensor measurement range and not in engineering units. The report file in ASCII-format is the raw data file delivered to the data base SICADA.

The *.ht2-files are automatically named with borehole id, top of test section and date and time of test start (as for example __KFM09B_0106.00_200511171609.ht2). The name differs slightly from the convention stated in Instruction for analysis of injection and single-hole pumping tests, SKB MD 320.004.

Using the IPPLOT software (Version 3.0), the *.ht2-files are converted to parameter files suitable for plotting using the code SKB-plot and analysis with the AQTESOLV software.

A backup of data files was created on a regular basis by CD-storage and by sending the files to the Geosigma office in Uppsala by a file transfer protocol. A file description table is presented in Appendix 1.

5.4 Analysis and interpretation

5.4.1 General

As described in Section 5.2.1, the injection tests in KFM09B were performed as transient constant head tests followed by a pressure recovery period. From the injection period, the (reciprocal) flow rate versus time was plotted in log-log and lin-log diagrams together with the corresponding derivative. From the recovery period, the pressure was plotted versus Agarwal equivalent time in lin-log and log-log diagrams, respectively, together with the corresponding derivative. The routine data processing of the measured data was done according to the Instruction for analysis of injection and single-hole pumping tests (SKB MD 320.004).

For evaluation of the test data, no corrections of the measured flow rate and absolute pressure data (e.g. due to barometric pressure variations or tidal fluctuations) have been made. For short-time single-hole tests, such corrections are generally not needed, unless very small pressure changes are applied. No subtraction of the barometric pressure from the measured absolute pressure has been made, since the length of the test periods are short relative to the time scale for barometric pressure changes. In addition, pressure differences rather than the pressure magnitudes are used by the evaluation.

5.4.2 Measurement limit for flow rate and specific flow rate

The estimated standard lower measurement limit for flow rate for injection tests with PSS is c 1 mL/min ($1.7 \cdot 10^{-8}$ m^3/s). However, if the flow rate for a test was close to, or below, the standard lower measurement limit, a test-specific estimate of the lower measurement limit of flow rate was made. The test-specific lower limit was based on the measurement noise level of the flow rate before and after the injection period. The decisive factor for the varying lower measurement limit is not identified, but it might be of both technical and hydraulic character.

The lower measurement limit for transmissivity is defined in terms of the specific flow rate (Q/s). The minimum specific flow rate corresponds to the estimated lower measurement limit of the flow rate together with the actual injection pressure during the test, see Table 5-2. The intention during this test campaign was to use a standard injection pressure of 200 kPa (20 m water column). Still, the injection pressure can be considerably different (see Section 6.2.3). An apparently low injection pressure is often the result of a test section of low conductivity due to a pressure increase, caused by packer expansion, before the injection start. A highly conductive section may also result in a low injection pressure due to limited flow capacity of PSS.

Whenever the final flow rate (Q_p) was not defined (i.e. not clearly above the measurement noise before and after the injection period), the estimated lower measurement limit for specific flow rate was based on the estimated lower measurement limit for flow rate for the specific test and a standard injection pressure of 200 kPa. This is done in order to avoid excessively high, apparent estimates of the specific flow rate for these low conductivity sections, which would have resulted if the actual pressure difference at start of injection had been used as injection pressure.

The lower measurement limits for the flow rate correspond to different values of steady-state transmissivity, T_M, depending on the section lengths used in the factor C_M in Moye's formula, as described in the Instruction for analysis of injection and single-hole pumping tests (SKB MD 320.004), see Table 5-2.

The practical upper measurement limit of hydraulic transmissivity for the PSS system is estimated at a flow rate of c 30 L/min ($5 \cdot 10^{-4}$ m^3/s) and an injection pressure of c 1 m. Thus, the upper measurement limit for the specific flow rate is $5 \cdot 10^{-4}$ m^2/s. However, the practical upper measurement limit may vary, depending on e.g. depth of the test section (friction losses in the pipe string).

5.4.3 Qualitative analysis

Initially, a qualitative evaluation of actual flow regimes, e.g. wellbore storage (WBS), pseudo-radial flow regime (PRF), pseudo-spherical flow regime (PSF) and pseudo-stationary flow regime (PSS), respectively, was performed. In addition, indications of outer boundary conditions during the tests were identified. The qualitative evaluation was mainly interpreted from the log-log plots of flow rate and pressure together with the corresponding derivatives.

In particular, time intervals with pseudo-radial flow, reflected by a constant (horizontal) derivative in the test diagrams, were identified. Pseudo-linear flow may, at the beginning of the test, be reflected by a straight line of slope 0.5 or less in log-log diagrams, both for the measured variable (flow rate or pressure) and the derivative. A true spherical flow regime is reflected by a straight line with a slope of –0.5 for the derivative. However, other slopes may indicate transitions to pseudo-spherical (leaky) or pseudo-stationary flow. The latter flow regime corresponds to almost stationary conditions with a derivative approaching zero.

Table 5-2. Estimated lower measurement limit for specific flow rate and steady-state transmissivity for different injection pressures, measurement scales and estimated lower measurement limits for flow rate for the injection tests in borehole KFM09B.

r_w (m)	L_w (m)	Q-measl-L (m^3/s)	Injection pressure (kPa)	Q/s-measl-L (m^2/s)	Factor C_M in Moye's formula	T_M-measl-L (m^2/s)
0.03865	100	1.7E–08	100	1.6E–09	1.30	2.1E–09
0.03865	100	1.7E–08	200	8.2E–10	1.30	1.1E–09
0.03865	100	1.7E–08	300	5.5E–10	1.30	7.1E–10
0.03865	100	1.2E–08	100	1.1E–09	1.30	1.5E–09
0.03865	100	1.2E–08	200	5.7E–10	1.30	7.4E–10
0.03865	100	1.2E–08	300	3.8E–10	1.30	5.0E–10
0.03865	100	5.0E–09	100	4.9E–10	1.30	6.4E–10
0.03865	100	5.0E–09	200	2.5E–10	1.30	3.2E–10
0.03865	100	5.0E–09	300	1.6E–10	1.30	2.1E–10
0.03865	20	1.7E–08	100	1.6E–09	1.04	1.7E–09
0.03865	20	1.7E–08	200	8.2E–10	1.04	8.5E–10
0.03865	20	1.7E–08	300	5.5E–10	1.04	5.7E–10
0.03865	20	1.2E–08	100	1.1E–09	1.04	1.2E–09
0.03865	20	1.2E–08	200	5.7E–10	1.04	6.0E–10
0.03865	20	1.2E–08	300	3.8E–10	1.04	4.0E–10
0.03865	20	5.0E–09	100	4.9E–10	1.04	5.1E–10
0.03865	20	5.0E–09	200	2.5E–10	1.04	2.6E–10
0.03865	20	5.0E–09	300	1.6E–10	1.04	1.7E–10
0.03865	5	1.7E–08	100	1.6E–09	0.82	1.3E–09
0.03865	5	1.7E–08	200	8.2E–10	0.82	6.7E–10
0.03865	5	1.7E–08	300	5.5E–10	0.82	4.5E–10
0.03865	5	1.2E–08	100	1.1E–09	0.82	9.4E–10
0.03865	5	1.2E–08	200	5.7E–10	0.82	4.7E–10
0.03865	5	1.2E–08	300	3.8E–10	0.82	3.1E–10
0.03865	5	5.0E–09	100	4.9E–10	0.82	4.0E–10
0.03865	5	5.0E–09	200	2.5E–10	0.82	2.0E–10
0.03865	5	5.0E–09	300	1.6E–10	0.82	1.3E–10

The interpreted flow regimes can also be described in terms of the distance from the borehole:

- **Inner zone:** Representing very early responses that may represent the fracture properties close to the borehole which may possibly be affected by turbulent head losses. These properties are generally reflected by the skin factor.
- **Middle zone:** Representing the first response from which it is considered possible to evaluate the hydraulic properties of the formation close to the borehole.
- **Outer zone:** Representing the response at late times of hydraulic structure(s) connected to the hydraulic feature for the middle zone. Sometimes it is possible to deduce the possible character of the actual feature or boundary and evaluate the hydraulic properties.

Due to the limited resolution of the flow meter and pressure sensor, the derivative may some times indicate a false horizontal line by the end of periods with pseudo-stationary flow. Apparent no-flow (NFB) and constant head boundaries (CHB), or equivalent boundary conditions of fractures, are reflected by an increase/decrease of the derivative, respectively.

5.4.4 Quantitative analysis

A preliminary steady-state analysis of transmissivity according to Moye's formula (denoted T_M) was made for the injection period for all tests in conjunction with the qualitative analysis according to the following equations:

$$T_M = \frac{Q_p \cdot \rho_w \cdot g}{dp_p} \cdot C_M \tag{5-1}$$

$$C_M = \frac{1 + \ln\left(\frac{L_w}{2r_w}\right)}{2\pi} \tag{5-2}$$

Q_p = flow rate by the end of the flow period (m^3/s)

ρ_w = density of water (kg/m^3)

g = acceleration of gravity (m/s^2)

C_M = geometrical shape factor (–)

dp_p = injection pressure $p_p - p_i$ (Pa)

r_w = borehole radius (m)

L_w = section length (m)

From the results of the qualitative evaluation, appropriate interpretation models for the quantitative evaluation of the tests were selected. When possible, transient analysis was made on both the injection and recovery periods of the tests.

The transient analysis was performed using a special version of the test analysis software AQTESOLV, which enables both visual and automatic type curve matching. The quantitative transient evaluation is generally carried out as an iterative process of manual type curve matching and automatic matching. For the injection period, a model based on the Jacob and Lohman (1952) solution /1/ was applied for estimating the transmissivity and skin factor for an assumed value on the storativity when a certain period with pseudo-radial flow could be identified. The model is based on the effective wellbore radius concept to account for non-zero (negative) skin factors according to Hurst, Clark and Brauer (1969) /2/.

In borehole KFM09B, the storativity was calculated using an empirical regression relationship between storativity and transmissivity, see Equation 5-3 (Rhén et al. 1997) /3/. Firstly, the transmissivity and skin factor were obtained by type curve matching on the data curve using a fixed storativity value of 10^{-6}, according to the instruction SKB MD 320.004. From the transmissivity value obtained, the storativity was then calculated according to Equation 5-3 and the type curve matching was repeated. In most cases the change of storativity did not significantly alter the calculated transmissivity by the new type curve matching. Instead, the estimated skin factor, which is strongly correlated to the storativity using the effective borehole radius concept, was altered correspondingly.

$$S = 0.0007 \cdot T^{0.5} \tag{5-3}$$

S = storativity (–)

T = transmissivity (m^2/s)

For transient analysis of the recovery period, a model presented by Dougherty-Babu (1984) /4/ was used when a certain period with pseudo-radial flow could be identified. In this model, a variety of transient solutions for flow in fractured porous media is available, accounting for e.g. wellbore storage and skin effects, double porosity etc. The solution for wellbore storage and skin effects is analogous to the corresponding solution presented in Earlougher (1977) /5/ based on the effective wellbore radius concept to account for non-zero (negative) skin factors. However, for tests in isolated test sections, wellbore storage is represented by a radius of a fictive standpipe (denoted fictive casing radius, r(c)) connected to the test section, cf Equation 5-6. This concept is equivalent to calculating the wellbore storage coefficient C from the compressibility in an isolated test section according to Equation 5-5.

The model by Dougherty-Babu (1984) was used to estimate the transmissivity and skin factor from the recovery period. The storativity was calculated using Equation 5-3 in the same way as described above for the transient analysis of the injection period. In addition, the wellbore storage coefficient was estimated, both from the simulated value on the fictive casing radius r(c) and from the slope of 1:1 in the log-log recovery plots.

For tests characterized by pseudo-spherical (leaky) flow or pseudo-stationary flow during the injection period, a model by Hantush (1959) /6/ for constant head tests was adopted for the evaluation. In this model, the skin factor is not separated but can be calculated from the simulated effective borehole radius according to Equation 5-4. This model also allows calculation of the wellbore storage coefficient according to Equation 5-6. In addition, the leakage coefficient K'/b' can be calculated from the simulated leakage factor r/B. The corresponding model for constant flow rate tests, Hantush (1955) /7/, was applied for evaluation of the recovery period for tests showing pseudo-spherical- or pseudo-stationary flow during this period.

$$\zeta = ln(r_w/r_{wf}) \qquad (5\text{-}4)$$

ζ = skin factor

r_w = borehole radius (m)

r_{wf} = effective borehole radius

Some tests showed fracture responses (a slope of 0.5 or less in a log-log plot). A model for single fractures was then used for the transient analysis as a complement to the standard models. The model by Ozkan-Raghavan (1991a) /8/ and (1991b) /9/ for a vertical fracture was employed. In this case, the test section length was used to convert K and S_s to T and S, respectively, after analysis by fracture models. The quotient K_x/K_y of the hydraulic conductivity in the x and the y-direction, respectively, was assumed to be 1.0 (one). Type curve matching provided values of K_x and L_f, where L_f is the theoretical fracture length.

The different transient estimates of transmissivity from the injection and recovery period, respectively, were then compared and examined. One of these was chosen as the best representative value of the transient transmissivity of the formation adjacent to the test section. This value is denoted T_T. In cases with more than one pseudo-radial flow regime during the injection or recovery period, the first one is in most cases assumed as the most representative for the hydraulic conditions in the rock close to the tested section.

Finally, a representative value of transmissivity of the test section, T_R, was chosen from T_T and T_M. The latter transmissivity is to be chosen whenever a transient evaluation of the test data is not possible or not being judged as reliable. If the flow rate by the end of an injection period (Q_p) is too low to be defined, and thus neither T_T nor T_M can be estimated, the representative transmissivity for the test section is considered to be less than T_M based on the estimated lower measurement limit for Q/s (i.e. $T_R < T_M$ = Q/s-measl-L·C_M).

Estimated values of the borehole storage coefficient, C, based on actual borehole geometrical data and assumed fluid properties are shown in Table 5-3. The net water volume in the test section, V_w, has in Table 5-3 been calculated by subtracting the volume of equipment in the test section (pipes and thin hoses) from the total volume of the test section. For an isolated test section, the wellbore storage coefficient, C, may be calculated as by Almén et al. (1986) /10/:

$$C = V_w \cdot c_w = L_w \cdot \pi \cdot r_w^2 \cdot c_w \qquad (5\text{-}5)$$

V_w = water volume in test section (m^3)

r_w = nominal borehole radius (m)

L_w = section length (m)

c_w = compressibility of water (Pa^{-1})

When appropriate, estimation of the actual borehole storage coefficient C in the test sections was made from the recovery period, based on the early borehole response with 1:1 slope in the log-log diagrams. The coefficient C was calculated only for tests with a well-defined line of slope 1:1 in the beginning of the recovery period. In the most conductive sections, this period occurred during very short periods at early test times. The latter values may be compared with the net values of C based on geometry and the value of C_{eff} based on laboratory experiments /11/, (Table 5-3).

Furthermore, when using the model by Dougherty-Babu (1984) /4/, a fictive casing radius, r(c), is obtained from the parameter estimation of the recovery period. This value can then be used for calculating C as by Almén et al. (1986) /10/:

$$C = \frac{\pi \cdot r(c)^2}{\rho \cdot g} \qquad (5\text{-}6)$$

Although this calculation was not done regularly and the results are not presented in this report, the calculations corresponded in most cases well to the value of C obtained from the line of slope 1:1 in the beginning of the recovery period.

The estimated values of C from the tests may differ from the net values in Table 5-3 based on geometry. For example, the effective compressibility for an isolated test section may sometimes be higher than the water compressibility due to e.g. packer compliance, resulting in increased C-values.

The radius of influence at a certain time may be estimated from Jacob's approximation of the Theis' well function, Cooper and Jacob (1946) /12/:

$$r_i = \sqrt{\frac{2.25Tt}{S}} \qquad (5\text{-}7)$$

Table 5-3. Calculated net values of C, based on the actual geometrical properties of the borehole and equipment configuration in the test section (C_{net}) together with the effective wellbore storage coefficient (C_{eff}) for injection tests from laboratory experiments /11/.

r_w (m)	L_w (m)	Volume of test section (m^3)	Volume of equipment in section (m^3)	V_w (m^3)	C_{net} (m^3/Pa)	C_{eff} (m^3/Pa)
0.03865	100	0.469	0.061	0.408	$1.9 \cdot 10^{-10}$	$1.9 \cdot 10^{-10}$
0.03865	20	0.094	0.013	0.081	$3.7 \cdot 10^{-11}$	$4.3 \cdot 10^{-11}$
0.03865	5	0.023	0.04	0.019	$9.0 \cdot 10^{-12}$	$1.6 \cdot 10^{-11}$

T = representative transmissivity from the test (m^2/s)

S = storativity estimated from Equation 5-3

r_i = radius of influence (m)

t = time after start of injection (s)

If a certain time interval of pseudo-radial flow (PRF) from t_1 to t_2 can be identified during the test, the radius of influence is estimated using time t_2 in Equation 5-7. If no interval of PRF can be identified, the actual total flow time t_p is used. The radius of influence can be used to deduce the length of the hydraulic feature(s) tested.

Furthermore, an r_i-index (–1, 0 or 1) is defined to characterize the hydraulic conditions by the end of the test. The r_i-index is defined as shown below. It is assumed that a certain time interval of PRF can be identified between t_1 and t_2 during the test.

- r_i-index = 0: The transient response indicates that the size of the hydraulic feature tested is greater than the radius of influence based on the actual test time (t_2=t_p), i.e. the PRF is continuing at stop of the test. This fact is reflected by a flat derivative at this time.
- r_i-index = 1: The transient response indicates that the hydraulic feature tested is connected to a hydraulic feature with lower transmissivity or an apparent barrier boundary (NFB). This fact is reflected by an increase of the derivative. The size of the hydraulic feature tested is estimated as the radius of influence based on t_2.
- r_i-index = –1: The transient response indicates that the hydraulic feature tested is connected to a hydraulic feature with higher transmissivity or an apparent constant head boundary (CHB). This fact is reflected by a decrease of the derivative. The size of the hydraulic feature tested is estimated as the radius of influence based on t_2.

If a certain time interval of PRF cannot be identified during the test, the r_i-indices –1 and 1 are defined as above. In such cases the radius of influence is estimated using the flow time t_p in Equation 5-7.

5.5 Nonconformities

The test program in KFM09B was carried out according to the Activity Plan AP PF 400-06-003 with the following exceptions:

- The Tecalan hose connected to P_{bubbel}, the transducer measuring the ground water level, could not be put into position in the borehole before testing. This was due to the small diameter of the borehole which made it impossible to descend it to the ground water surface.

- The packers were expanded progressively and the nominal expansion pressure could not be reached for some sections in the deeper parts of the borehole. This was because the pressure below the test section rose too much due to packer compliance.
- A leakage was noticed in the lower packer during packer expansion in the first test of 100 m section length. A leakage in the upper packer was also noticed in the beginning of packer expansion while testing section 315.0–335.0 m. The packers were exchanged when the leakage was noticed. It is assumed that the test results are not influenced by the occasional leakage of the packers.
- The pressure sensor measuring the pressure above the test section, P_a, broke down during the performance of the tests with 20 m section length. The sensor was out of function during 5 injection tests and then replaced. Hence, the tests with 20 m section length in the interval 235.0–315.0 m have no reliable registration of the pressure above the test section.
- Due to major fractures or cavities in the borehole, some of the test positions were shifted. This resulted in some partly overlapping sections, and that some of the intervals measured with different section lengths are not identical.
- Two out of the four planned injection tests of 5 m section length within the borehole interval 525.5–545.5 m were not performed. This was decided in agreement with the Activity leader, based on some calculations, showing that the total transmissivity in the actual 20 m section had already been identified from the previous tests.

6 Results

6.1 Nomenclature and symbols

The nomenclature and symbols used for the results of the injection tests in KFM09B are in accordance with the Instruction for analysis of injection and single-hole pumping tests (SKB MD 320.004). Additional symbols are explained in the text and in Appendix 5. Symbols used by the AQTESOLV software are explained in Appendix 3.

6.2 Routine evaluation of the single-hole injection tests

6.2.1 General test data

General test data and selected pressure and flow data from all tests are listed in Appendix 2.1 and 2.2, respectively.

During some injection tests in KFM09B pumping was performed in HFM01 and HFM22 to support the on-going drilling in KFM01D and KFM08C with flushing water. For some tests the pumping might have decreased the format pressure in KFM09B, which can lead to an overestimation of the transmissivity in the section. When suspected that the format pressure was affected by the pumping, this was commented on (see Section 6.2.4).

6.2.2 Length corrections

The down-hole equipment is supplied with a level indicator located c 3 m below the lower packer in the test section, see Figure 4-2. The level indicator transmits a signal each time a reference mark in the borehole is passed. In KFM09B, reference marks were milled into the borehole wall at every 50 m.

During the injection tests in KFM09B with the PSS, length reference marks were detected as presented in Table 6-1. As seen from Table 6-1, all of the length marks of the borehole were detected. For the 100 m section, it is not possible to get a signal from the level indicator for the first two marks since the test equipment is not fully assembled at the time of passing those reference marks. At each mark, the length scale for the injection tests was adjusted according to the reported length to the reference mark.

The largest difference between the reported and measured lengths at the reference marks during the injection tests was 0.17 m, at the 550 m reference mark. The difference between two consecutive measurements over a 100 m borehole interval was 0.08 m or less in all cases. A comparison of the measurements performed with different section lengths results in a maximum difference of 0.01 m.

Since the length scale was adjusted in the field every time a reference mark was passed, and because the difference between consecutive marks was small, it was not found worthwhile to make any further adjustments after the measurements, e.g. by linear interpolation between reference marks.

Table 6-1. Detected reference marks during the injection tests in KFM09B.

Borehole length (m)	Detected during the injection tests in 100 m sections	Detected during the injection tests in 20 m sections	Detected during the injection tests in 5 m sections
50.0		Yes	Yes
100.0		Yes	Yes
150.0	Yes	Yes	Yes
200.0	Yes	Yes	Yes
250.0	Yes	Yes	Yes
300.0	Yes	Yes	Yes
350.0	Yes	Yes	Yes
400.0	Yes	Yes	Yes
450.0	Yes	Yes	Yes
500.0	Yes	Yes	Yes
550.0	Yes	Yes	Yes

6.2.3 General results

For the injection tests, transient evaluation was conducted, whenever possible, both on the injection and recovery periods (e.g. transmissivity T_f and T_s, respectively) according to the methods described in Section 5.4.4. The steady-state transmissivity (T_M) was calculated by Moye's formula according to Equation 5-1. Transient evaluation was performed for all tests for which a significant final flow rate, Q_p, could be identified, see Section 5.4.2. The quantitative analysis was conducted using the AQTESOLV software.

The dominating transient flow regimes during the injection and recovery periods, as interpreted from the qualitative test evaluation, are listed in Table 6-2 and further commented on in Section 6.2.4. The transmissivity judged as the most reliable from the transient evaluation of the flow- and recovery periods of the tests was selected as T_T, see Table 6-2.

The transient estimates of transmissivity from the injection period were in most cases considered more representative than those from the recovery period. Several of the responses during the recovery period were strongly influenced by wellbore storage effects. In addition, pseudo-linear flow occurred during the recovery period of several tests in KFM09B, frequently in conjunction with apparent no-flow boundaries (NFB), see below. Thus, for many tests, pseudo-radial flow was not reached during this period.

On the other hand, during the injection period a certain time interval with pseudo-radial flow could, in most tests, be identified. Consequently, standard methods for single-hole tests with wellbore storage and skin effects were generally used for the routine evaluation of the tests. The approximate start and stop times of the pseudo-radial flow regime used for the transient evaluation are also listed in Table 6-2.

A fairly well-defined time interval with pseudo-radial flow could be identified from the injection period in about 60% of the evaluated tests in 5 m sections, cf Table 6-3. The transient evaluation of transmissivity from the injection period was in most cases (c 64% of the tests) also judged as the most representative estimate of transmissivity, T_R, of the test section.

Table 6-2. Summary of the routine evaluation of the single-hole injection tests in borehole KFM09B.

Secup (m)	Seclow (m)	Test start YYYY-MM-DD hh:mm	b (m)	Flow regime [1] injec-tion	Recovery	T_M (m²/s)	T_f (m²/s)	T_s (m²/s)	T_T (m²/s)	T_R [2] (m²/s)	ξ (-)	t_1 (s)	t_2 (s)	dte_1 (s)	dte_2 (s)	C (m³/Pa)	r^i (m)	r_i-index (-)
55.00	155.00	2006-02-09 14:28	100.0	PLF	PLF	1.64E–05	1.62E–06	3.88E–06	1.62E–06	1.62E–06							86.15	1
155.00	255.00	2006-02-10 07:19	100.0	PLF->	PLF	3.51E–06	6.30E–07		6.30E–07	6.30E–07							68.02	1
255.00	355.00	2006-02-10 11:13	100.0	PLF->	WBS ->(PRF)	3.62E–09	9.36E–10	7.32E–10	7.32E–10	7.32E–10	–4.77	300	1,800	2,000	2,700	3.46E–10	15.32	0
355.00	455.00	2006-02-10 13:47	100.0	PRF ->NFB	WBS ->NFB?	4.01E–08	1.98E–08	3.27E–08	1.98E–08	1.98E–08	–2.83	20	1,000	–	–	4.45E–10	21.25	1
455.00	555.00	2006-02-13 09:33	100.0	PLF	PLF	2.57E–09	3.10E–10	6.74E–10	6.74E–10	6.74E–10							12.28	1
507.00	607.00	2006-02-13 14:06	100.0	NFB	PLF	2.25E–08		2.74E–08	2.74E–08	2.74E–08	–6.03						30.78	1
55.00	75.00	2006-02-15 13:24	20.0	PRF ->NFB	PLF ->PRF ->NFB	5.86E–06	3.53E–06	4.53E–06	3.53E–06	3.53E–06	–4.01	200	1,000	50	200		77.73	1
75.00	95.00	2006-02-15 15:33	20.0	PRF ->NFB	PLF ->PRF ->NFB	7.80E–06	4.28E–06	6.70E–06	4.28E–06	4.28E–06	–4.75	100	450	10	100		54.71	1
95.00	115.00	2006-02-15 17:22	20.0	PLF ->PRF	PLF ->NFB	8.80E–07	2.59E–07	2.83E–07	2.59E–07	2.59E–07	–5.44						44.60	0
115.00	135.00	2006-02-16 07:23	20.0	NFB	PLF ->NFB	2.47E–06		1.14E–06	1.14E–06	2.47E–06							78.28	1
135.00	155.00	2006-02-16 09:03	20.0	PLF ->(PRF)	PLF ->NFB?	8.60E–08	1.51E–08	1.96E–08	1.51E–08	1.51E–08		300	1,200				21.79	0
155.00	175.00	2006-02-16 10:38	20.0	PLF ->PSF	PLF->	1.19E–06	1.42E–07	1.43E–07	1.42E–07	1.42E–07							38.37	–1
175.00	195.00	2006-02-16 12:48	20.0	PLF	PLF	5.81E–09	1.03E–09	1.90E–09	1.90E–09	1.90E–09							13.03	0
195.00	215.00	2006-02-16 14:33	20.0	–	–	<2.61E–10				<2.61E–10							–	–
215.00	235.00	2006-02-16 16:02	20.0	PLF	PLF	7.34E–09	5.81E–10	7.97E–10	7.97E–10	7.97E–10							10.48	1
235.00	255.00	2006-02-17 08:34	20.0	NFB ->PLF?	PLF	1.65E–06		4.68E–07	4.68E–07	4.68E–07							51.60	1
255.00	275.00	2006-02-17 10:18	20.0	–	–	<2.61E–10				<2.61E–10							–	–

Secup (m)	Seclow (m)	Test start YYYY-MM-DD hh:mm	b (m)	Flow regime 1) injec-tion	Recovery	T_M (m^2/s)	T_f (m^2/s)	T_s (m^2/s)	T_T (m^2/s)	T_R 2) (m^2/s)	ξ (-)	t_1 (s)	t_2 (s)	dte_1 (s)	dte_2 (s)	C (m^3/Pa)	r^i (m)	r_i-index (-)
275.00	295.00	2006-02-17 12:39	20.0	PRF	WBS->?	2.21E–09	1.30E–09		1.30E–09	1.30E–09	–2.01	20	1,200			5.23E–11	11.80	0
295.00	315.00	2006-02-17 14:20	20.0	PLF ->NFB	WBS ->PRF ->NFB?	6.07E–10	3.13E–10	4.19E–10	4.19E–10	4.19E–10	–3.61			300	700	4.95E–11	6.79	1
315.00	335.00	2006-02-17 16:02	20.0	–	–	<2.87E–10				<2.87E–10							–	–
335.00	355.00	2006-02-21 10:56	20.0	–	–	<2.14E–10				<2.14E–10							–	–
355.00	375.00	2006-02-21 12:45	20.0	PLF/ NFB	WBS->	3.27E–10		1.51E–10	1.51E–10	3.27E–10	–5.51						8.42	1
375.00	395.00	2006-02-21 14:24	20.0	PRF ->(NFB)	WBS ->PRF ->NFB	3.98E–08	2.93E–08	5.13E–08	2.93E–08	2.93E–08	–1.87	40	1,200	200	400		25.68	0
395.00	415.00	2006-02-21 16:09	20.0	PLF	WBS->	9.27E–10	1.77E–10	2.75E–10	2.75E–10	2.75E–10	–5.15						8.03	1
415.00	435.00	2006-02-22 08:52	20.0	–	–	<2.13E–10				<2.13E–10							–	–
435.00	455.00	2006-02-22 10:03	20.0	–	–	<2.76E–10				<2.76E–10							–	–
455.00	475.00	2006-02-22 11:06	20.0	–	–	<3.41E–10				<3.41E–10							–	–
475.00	495.00	2006-02-22 13:30	20.0	NFB	PLF	1.30E–09		1.07E–10	1.07E–10	1.07E–10							6.35	–
495.00	515.00	2006-02-22 15:14	20.0	–	–	<2.13E–10				<2.13E–10							–	–
505.00	525.00	2006-02-22 16:12	20.0	–	–	<2.13E–10				<2.13E–10							–	–
515.00	535.00	2006-02-23 08:37	20.0	NFB	PLF	1.10E–09		7.69E–10	7.69E–10	7.69E–10							10.40	1
525.50	545.50	2006-02-23 10:10	20.0	NFB	PLF	1.00E–09		8.34E–10	8.34E–10	8.34E–10							10.61	1
535.00	555.00	2006-02-23 11:42	20.0	–	–	<3.41E–10				<3.41E–10							–	–
545.50	565.50	2006-02-23 13:24	20.0	–	–	<3.41E–10				<3.41E–10							–	–
565.50	585.50	2006-02-23 14:29	20.0	NFB	PLF ->(PRF)	2.34E–08		3.50E–08	3.50E–08	3.50E–08	–6.36			7,000	10,000		77.56	0
585.50	605.50	2006-02-23 16:09	20.0	–	–	<2.76E–10				<2.76E–10							–	–

Secup (m)	Seclow (m)	Test start YYYY-MM-DD hh:mm	b (m)	Flow regime 1) injec-tion	Recovery	T_M (m^2/s)	T_f (m^2/s)	T_s (m^2/s)	T_T (m^2/s)	T_R 2) (m^2/s)	ξ (-)	t_1 (s)	t_2 (s)	dte_1 (s)	dte_2 (s)	C (m^3/Pa)	r^i (m)	r_i-index (-)
10.50	15.50	2005-11-23 13:55	5.0	PRF	PRF	1.24E–06	2.42E–06	1.88E–06	2.42E–06	2.42E–06	2.47	80	1,200	30	700		77.45	0
15.50	20.50	2005-11-25 14:49	5.0	PSF ->PSS?	PSS->	1.65E–05	5.57E–06		5.57E–06	5.57E–06	–5.32						96.04	–1
18.00	23.00	2005-11-25 12:55	5.0	PSF	PSS	1.12E–05	6.22E–06		6.22E–06	6.22E–06	–4.51						98.73	–1
21.30	26.30	2005-11-25 10:24	5.0	PLF ->PRF	WBS->	6.94E–08	7.64E–08		7.64E–08	7.64E–08	–1.14	700	1,200				32.65	0
24.00	29.00	2005-11-23 18:10	5.0	PSF	WBS->	1.28E–07	3.29E–08	2.92E–08	3.29E–08	3.29E–08	–5.28						26.69	–1
29.00	34.00	2005-11-23 20:38	5.0	(PLF) ->PRF ->PSS	PLF ->(PRF) ->PSF	2.38E–08	5.82E–09	5.13E–09	5.82E–09	5.82E–09							17.32	–1
34.00	39.00	2005-11-23 22:58	5.0	PSF	WBS ->PSF	2.85E–08	1.70E–08		1.70E–08	1.70E–08	–3.19						22.64	–1
39.00	44.00	2005-11-24 09:12	5.0	PSF	PLF ->CHB	2.92E–08	5.80E–09		5.80E–09	5.80E–09	–4.99						17.28	–1
44.00	49.00	2005-11-24 11:04	5.0	PRF	(PRF) ->NFB ->PSF?	1.30E–06	2.37E–06	4.18E–06	2.37E–06	2.37E–06	1.77	40	1,200				77.03	0
49.00	54.00	2005-11-24 13:25	5.0	PLF ->(PRF)	PLF	4.57E–05	8.93E–06		8.93E–06	8.93E–06							108.10	0
52.75	57.75	2005-11-24 15:53	5.0	PRF	PLF ->(PRF)	1.76E–05	9.58E–06	6.42E–06	9.58E–06	9.58E–06	–5.32	150	1,200				109.26	0
55.00	60.00	2006-03-13 14:47	5.0	PRF	WBS ->(PRF)	1.11E–09	6.86E–10	6.07E–10	6.86E–10	6.86E–10	–2.68	30	1,800	0	500		12.31	0
60.00	65.00	2006-02-27 10:38	5.0	PRF ->NFB	(WBS) ->(PRF) ->NFB	3.70E–06	2.42E–06	7.98E–06	2.42E–06	2.42E–06	–4.64	100	700				59.17	1
65.00	70.00	2006-02-27 12:31	5.0	PRF ->PSF	PLF ->(PRF) ->PSF	9.30E–07	8.70E–07	8.26E–07	8.70E–07	8.70E–07	–2.05	100	300				29.99	–1
70.00	75.00	2006-02-27 13:58	5.0	PRF	WBS->	6.82E–08	5.04E–08	2.24E–08	5.04E–08	5.04E–08	–2.93	100	1,200				29.42	0
75.00	80.00	2006-02-27 15:26	5.0	(PRF) ->PLF/ NFB	(PRF) ->PLF/ NFB	5.43E–06	2.77E–06	8.17E–06	2.77E–06	2.77E–06	–5.95	100	200	10	100		32.70	1
80.00	85.00	2006-02-28 08:10	5.0	PLF/ PRF	PLF	3.64E–08	8.50E–09	3.73E–09	8.50E–09	8.50E–09							18.98	1

Secup (m)	Seclow (m)	Test start YYYY-MM-DD hh:mm	b (m)	Flow regime [1] injec-tion	Recovery	T_M (m^2/s)	T_f (m^2/s)	T_s (m^2/s)	T_T (m^2/s)	T_R [2] (m^2/s)	ξ (-)	t_1 (s)	t_2 (s)	dte_1 (s)	dte_2 (s)	C (m^3/Pa)	r^i (m)	r_i-index (-)
85.00	90.00	2006-02-28 09:34	5.0	PLF/ PRF	PLF/PRF	5.22E–09	1.31E–09	1.84E–09	1.84E–09	1.84E–09	–4.53						12.91	1
90.00	95.00	2006-02-28 11:02	5.0	NFB	PLF	3.56E–09		5.82E–09	5.82E–09	5.82E–09							17.19	1
95.00	100.00	2006-02-28 12:55	5.0	PLF/ PRF ->NFB	(PRF) ->NFB	5.20E–08	4.67E–08	2.93E–08	4.67E–08	4.67E–08							29.06	1
100.00	105.00	2006-02-28 14:18	5.0	PSF	PSF	3.80E–07	1.76E–07	3.62E–07	1.76E–07	1.76E–07	–4.21						40.46	–1
105.00	110.00	2006-02-28 15:43	5.0	PLF/ NFB	PLF/NFB	1.06E–07	2.37E–08	4.96E–08	2.37E–08	2.37E–08							24.51	1
110.00	115.00	2006-03-01 08:05	5.0	(PRF)	PLF/NFB	2.16E–07	5.49E–08		5.49E–08	5.49E–08	–5.77	200	1,200				30.06	0
115.00	120.00	2006-03-01 09:36	5.0	NFB	PLF	2.62E–07		1.46E–07	1.46E–07	1.46E–07							38.51	1
120.00	125.00	2006-03-01 11:02	5.0	–	–	<1.68E–10				<1.68E–10							–	–
125.00	130.00	2006-03-01 12:10	5.0	PLF ->PRF	PLF/NFB	1.03E–06	2.49E–07	1.77E–07	2.49E–07	2.49E–07							44.10	0
130.00	135.00	2006-03-01 13:34	5.0	PLF	PLF ->NFB	1.95E–06	2.93E–07	1.25E–07	2.93E–07	2.93E–07							45.96	1
135.00	140.00	2006-03-01 15:05	5.0	NFB/ PLF	PLF	7.97E–10		5.07E–10	5.07E–10	5.07E–10							9.35	1
140.00	145.00	2006-03-02 07:52	5.0	(PRF)?	WBS->	2.32E–10	5.02E–11	1.94E–10	1.94E–10	1.94E–10	–1.09					1.99E–11	7.39	1
145.00	150.00	2006-03-02 09:18	5.0	PLF	PLF	5.96E–08	1.36E–08	5.28E–09	1.36E–08	1.36E–08							21.36	1
150.00	155.00	2006-03-02 10:59	5.0	–	–	<2.17E–10				<2.17E–10							–	–
155.00	160.00	2006-03-02 11:54	5.0	(PLF) ->PRF	PLF/NFB ->PSF	1.83E–07	2.65E–07	3.55E–08	2.65E–07	2.65E–07	0.43	600	1,200				44.56	0
160.00	165.00	2006-03-13 12:45	5.0	PRF	PSS	2.30E–07	9.91E–07		9.91E–07	2.30E–07	14.91	100	1,800				43.32	0
165.00	170.00	2006-03-02 14:08	5.0	PSF	PLF ->NFB	6.28E–07	1.32E–07		1.32E–07	6.28E–07	–5.99						55.63	–1
170.00	175.00	2006-03-03 07:47	5.0	–	–	<2.17E–10				<2.17E–10							–	–
175.00	180.00	2006-03-03 08:56	5.0	–	–	<1.68E–10				<1.68E–10							–	–

Secup (m)	Seclow (m)	Test start YYYY-MM-DD hh:mm	b (m)	Flow regime [1)] injec-tion	Recovery	T_M (m^2/s)	T_f (m^2/s)	T_s (m^2/s)	T_T (m^2/s)	T_R [2)] (m^2/s)	ξ (-)	t_1 (s)	t_2 (s)	dte_1 (s)	dte_2 (s)	C (m^3/Pa)	r^i (m)	r_i-index (-)
180.00	185.00	2006-03-03 09:57	5.0	PLF ->(PRF) ->NFB	PLF ->PRF	2.24E–09	8.10E–10	1.53E–09	1.53E–09	1.53E–09	–4.16			200	1,500		13.72	0
185.00	190.00	2006-03-03 11:28	5.0	NFB	PLF	1.49E–09		1.08E–09	1.08E–09	1.08E–09							11.29	1
190.00	195.00	2006-03-03 13:39	5.0	PRF ->NFB	WBS ->(PRF)	1.50E–09	1.19E–09	2.99E–09	1.19E–09	1.19E–09	–2.47	30	1,000			1.82E–11	10.52	1
215.00	220.00	2006-03-13 10:12	5.0	NFB	WBS->	1.50E–09				1.50E–09							12.36	–
220.00	225.00	2006-03-06 08:24	5.0	PLF/ PRF	PLF ->PRF ->NFB	2.34E–09	6.17E–10	1.99E–09	6.17E–10	6.17E–10				10	200		9.86	0
225.00	230.00	2006-03-06 09:53	5.0	–	–	<2.17E–10				<2.17E–10							–	–
230.00	235.00	2006-03-06 10:49	5.0	PLF	PLF	1.72E-09		5.04E-10	5.04E-10	5.04E-10	-5.25						9.33	1
235.00	240.00	2006-03-06 13:01	5.0	PLF/ PRF	WBS	2.83E–09	8.62E–10	1.96E–10	8.62E–10	8.62E–10							10.72	0
240.00	245.00	2006-03-06 14:32	5.0	PRF ->NFB	PRF ->NFB/ PLF	3.82E–07	2.22E–07	4.38E–07	2.22E–07	2.22E–07	–4.82	40	300	10	250		21.32	1
245.00	250.00	2006-03-06 16:06	5.0	–	–	<2.17E–10				<2.17E–10							–	–
250.00	255.00	2006-03-07 08:40	5.0	NFB/ PLF	PLF	9.51E–07		6.43E–07	6.43E–07	6.43E–07							55.65	1
275.00	280.00	2006-03-07 10:33	5.0	PRF ->NFB	WBS ->PRF ->NFB	2.09E–09	2.51E–09	4.15E–09	2.51E–09	2.51E–09	–0.74	20	500	250	450		8.97	1
280.00	285.00	2006-03-07 12:50	5.0	PRF?	WBS->	3.22E–10	3.23E–10		3.23E–10	3.23E–10	–1.00	10	200			1.12E–11	3.40	1
285.00	290.00	2006-03-07 14:20	5.0	–	–	<2.17E–10				<2.17E–10							–	–
290.00	295.00	2006-03-07 15:32	5.0	–	–	<1.68E–10				<1.68E–10							–	–
373.00	378.00	2006-03-08 08:14	5.0	–	–	<2.17E–10				<2.17E–10							–	–
378.00	383.00	2006-03-08 09:11	5.0	PRF ->NFB	WBS ->PRF ->(NFB)	1.67E–08	2.62E–08	5.07E–08	2.62E–08	2.62E–08	1.10	30	400				14.42	1

Secup (m)	Seclow (m)	Test start YYYY-MM-DD hh:mm	b (m)	Flow regime [1] injec-tion	Recovery	T_M (m²/s)	T_f (m²/s)	T_s (m²/s)	T_T (m²/s)	T_R [2] (m²/s)	ξ (-)	t_1 (s)	t_2 (s)	dte_1 (s)	dte_2 (s)	C (m³/Pa)	r^i (m)	r_i-index (-)
383.00	388.00	2006-03-08 10:42	5.0	PRF	WBS ->PRF	2.03E–08	2.30E–08	3.03E–08	2.30E–08	2.30E–08	0.07	50	1,200	200	700	5.19E–11	24.19	0
388.00	393.00	2006-03-08 12:43	5.0	–	–	<2.17E–10				<2.17E–10							–	–
393.00	398.00	2006-03-08 13:46	5.0	–	–	<1.68E–10				<1.68E–10							–	–
475.00	480.00	2006-03-08 15:17	5.0	PLF/ NFB	PLF	9.82E–10	1.22E–10	4.30E–10	4.30E–10	4.30E–10							8.97	1
480.00	485.00	2006-03-09 08:34	5.0	–	–	<2.17E–10				<2.17E–10							–	–
485.00	490.00	2006-03-09 09:42	5.0	–	–	<2.17E–10				<2.17E–10							–	–
490.00	495.00	2006-03-09 10:43	5.0	–	–	<2.17E–10				<2.17E–10							–	–
515.00	520.00	2006-03-09 12:05	5.0	–	–	<2.17E–10				<2.17E–10							–	–
520.00	525.00	2006-03-09 13:48	5.0	–	–	<2.17E–10				<2.17E–10							–	–
525.00	530.00	2006-03-09 14:56	5.0	PLF ->NFB	PLF ->NFB	6.04E–10	8.22E–10	7.58E–10	7.58E–10	7.58E–10	–4.79						10.39	1
530.00	535.00	2006-03-09 16:41	5.0	PRF ->NFB	WBS->	2.79E–10	1.73E–10	2.32E–10	2.32E–10	2.32E–10	–1.67	30	500			1.42E–11	7.73	–1
564.50	569.50	2006-03-10 14:19	5.0	NFB	PLF	2.44E–08		7.48E–08	7.48E–08	2.44E–08							24.73	1
569.50	574.50	2006-03-10 09:45	5.0	PLF	PLF	4.31E–08	9.65E–09	5.05E–09	9.65E–09	9.65E–09							19.59	1
574.50	579.50	2006-03-10 11:24	5.0	–	–	<1.68E–10				<1.68E–10							–	–
579.50	584.50	2006-03-10 12:17	5.0	–	–	<1.68E–10				<1.68E–10							–	–
584.50	589.50	2006-03-10 13:17	5.0	–	–	<2.17E–10				<2.17E–10							–	–

[1] The acronyms in the column "Flow regime" are as follows: wellbore storage (WBS), pseudo-linear flow (PLF), pseudo-radial flow (PRF), pseudo-spherical flow (PSF), pseudo-stationary flow (PSS) and apparent no-flow boundary (NFB). The flow regime definitions are further discussed in Section 5.4.3 above.

[2] For the tests where Q_p was not detected, T_R was assumed to be less than T_M based on the estimated Q/s-measl-L.

For tests where transient evaluation was not possible or not considered representative, T_M was chosen as the representative transmissivity value, T_R. In only 6 out of 74 tests with a definable final flow rate in KFM09B the steady-state transmissivity, T_M, was chosen as the most representative value. If the final flow rate Q_p was below the actual test-specific measurement limit, the representative transmissivity value was assumed to be less than the estimated T_M, based on Q/s-measl-L.

The estimated standard lower measurement limit for flow rate for injection tests with PSS is c 1 mL/min ($1.7 \cdot 10^{-8}$ m^3/s). However, for approximately 35% of the injection tests in KFM09B, the lower measurement limit was close to, or below, the standard lower measurement limit. Hence a test-specific estimate of the lower measurement limit of flow rate was made which ranged from $2.8 \cdot 10^{-9}$ m^3/s to $6.5 \cdot 10^{-9}$ m^3/s. The lower measurement limit for transmissivity is defined in terms of the specific flow rate (Q/s), and the overall estimated test specific lower measurement limit for the specific flow rate in KFM09B ranged from $1.3 \cdot 10^{-10}$ m^2/s to $5.4 \cdot 10^{-9}$ m^2/s (see Section 5.4.2).

Selected test diagrams are presented in Appendix 3. In general, one linear diagram showing the entire test sequence together with lin-log and log-log diagrams from the injection and recovery periods, respectively, are presented. The quantitative analysis was performed from such diagrams using the AQTESOLV software. From tests with a flow rate below the estimated lower measurement limit for the specific test, only the linear diagram is presented. The results of the routine evaluation of the tests in borehole KFM09B are also compiled in appropriate tables in Appendix 5 to be stored in the SICADA database.

For a few tests, a type curve fit is displayed in the diagrams in Appendix 3 despite the fact that the estimated parameters from the fit are judged as ambiguous or non-representative and not included in the result tables in SICADA. For these tests, the type curve fit is presented as an example, e.g. to illustrate that an assumption of pseudo-radial flow regime is not justified for the test and some other flow regime is dominating or, alternatively, to show one possible fit in the case of unambiguous evaluation. For example, for test responses showing only wellbore storage and tests approaching a pseudo-stationary flow, no unambiguous transient evaluation is possible.

Some of the tests in KFM09B showed unusual responses, both during the injection- and recovery period, possibly representing flow in conductive fractures of limited extension or with varying apertures. During the injection period of these tests the flow rate decreased rapidly during the entire period indicating apparent no-flow boundaries (NFB), but the final flow rate was still rather high in many tests. No unambiguous transient evaluation of the injection period was possible for these tests. After stop of the injection, the pressure recovered very slowly and only to a limited extent during the recovery period. Examples of such sections are 115.0–135.0 m and 105.0–110.0 m. One possible explanation to these responses is flow in a rather high-conductive fracture close to the borehole with decreasing aperture away from the borehole or other geometrical restrictions of the fracture. Some other tests show initial pseudo-radial flow transitioning to flow in an apparent no-flow boundary, followed by slow and limited pressure recovery after the stop of the injection. An example is section 75.0–95.0 m.

In Figure 6-1, a comparison of calculated transmissivities in 5 m sections from steady-state evaluation (T_M) and transmissivity values from the transient evaluation (T_T) is shown. The agreement between the two populations is in general considered as good. Steady-state analysis of transmissivity according to Moye's formula (denoted T_M) may slightly overestimate the transmissivity if steady-state conditions do not prevail in the borehole. This fact is likely to be the main explanation to the predominance of points below the 1:1 curve since steady-state conditions are normally not attained during the injection period. In addition,

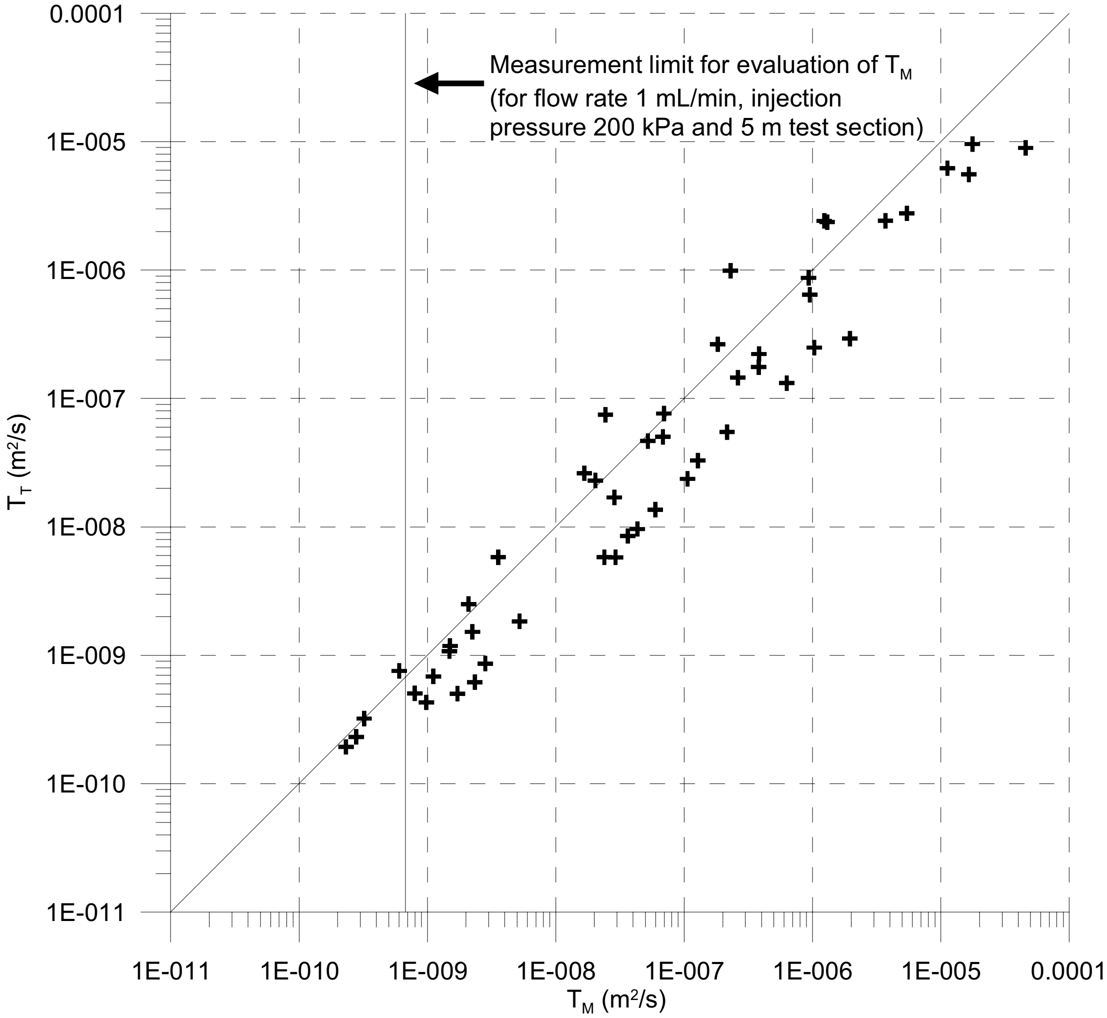

Figure 6-1. *Estimated transmissivities in 5 m sections from steady-state (T_M) and transient (T_T) evaluation in KFM09B.*

skin effects (both positive and negative) may cause discrepancies between transient and steady-state evaluation. For low values of transmissivity, discrepancies in T may also occur due to the definition of the lower measurement limit in transient and steady-state evaluation, respectively. In the latter evaluation the measurement limit is based on the test-specific flow rate while in transient evaluation, the transmissivity is based on the change of the (inverse) flow rate during the injection period.

In cases where apparent no-flow boundaries appear at the end of the injection period and transient evaluation is performed on the early part of the data curve, the steady-state transmissivity T_M may be low in comparison with the transient estimate of transmissivity. In this case, two different zones of the bedrock are measured during the early and late parts of the injection period, respectively.

The lower standard measurement limit of steady-state transmissivity in 5 m sections based on a flow rate of 1 mL/min and an injection pressure of 200 kPa is indicated in the figure. However, for some test sections in KFM09B, the actual injection pressure was considerably different, as previously denoted in section 5.4.2. The highest injection pressure during the tests in KFM09B was 381 kPa, and for five of the tests the injection pressure was below 100 kPa in the transient evaluation.

The wellbore storage coefficient, C, was calculated from the straight line with a unit slope in the log-log diagrams from the recovery period, see Table 6-2. The coefficient C was only calculated for tests with a well-defined line of unit slope in the beginning of the recovery period. In the most conductive sections, this period occurred during very short intervals at very early times and is not visible in the diagrams. In sections with a very low transmissivity, the estimates of C may be uncertain due to difficulties in defining an accurate time for the start of the recovery period. Furthermore, the resolution of the pressure sensors causes the recovery to be quite scattered in sections of low transmissivity. The values of C presented in Table 6-2 may be compared with the net values of C, C_{net} (based on geometry) and the value of C obtained from laboratory experiments, C_{eff} /11/, both found in Table 5-3.

The number of tests with a well-defined line of unit slope for which it was possible to calculate C was as follows: 2 out of 6 tests with a definable Q_p, when using the 100 m test section, resulted in a well-defined 1:1 straight line. The corresponding numbers for the 20 m tests were 2 out of 18, and for the 5 m tests; 5 out of 50. Table 6-2 shows that there is, in general, a good agreement between the calculated C values from the tests and those listed in Table 5-3, although the calculated values from the tests tend to be slightly higher. The higher C values observed in the tests may be explained by the compressibility contribution of the rock formation and water in good hydraulic connection (i.e. open fractures or cavities) with the section.

Two of the 100 m tests provided an estimate of C, both of which were slightly higher than the value in Table 5-3. When constructing 95% confidence intervals (using a t-distribution) from calculated values of C from the tests, the values of C_{net} and C_{eff} listed in Table 5-3 are within these confidence intervals for the 5 m and 20 m sections. The wellbore storage coefficient was also calculated from the simulation of the recovery responses in AQTESOLV based on the estimated radius of the fictive standpipe, r(c), to the test section according to Equation (5-6).

6.2.4 Comments on the tests

Short comments on each test follow below. Tests were performed within the interval 10.5–607.0 m in KFM09B. Flow regimes and hydraulic boundaries, as discussed in Section 5.4.3, are in the text referred to as:

WBS = Wellbore storage

PRF = Pseudo-radial flow regime

PLF = Pseudo-linear flow regime

PSF = Pseudo-spherical flow regime

PSS = Pseudo-stationary flow regime

NFB = No-flow boundary

CHB = Constant-head boundary

55.0–155.0 m

The injection pressure, and consequently the flow rate, was rather low (c 42 kPa) and unstable due the high transmissivity of the section. Still, the injection period indicates a PLF. A transient evaluation using both a PRF-model and PLF-model gives consistent results for the injection period. The recovery period only indicates a PLF and transient evaluation was made using a single-fracture model. A limited recovery (c 30 kPa) was obtained during the recovery period.

155.0–255.0 m

The time to achieve a stable injection pressure (c 120 kPa) was unusually long due to the rather high flow rate. Therefore, an interpretation of the early part of the injection is rather difficult. However, a PLF is assumed in the beginning of the period followed by a transition period to a possible PRF. The low skin factor obtained from a 2D-model may suggest dominating flow in a single fracture. The recovery period indicates a PLF but no unambiguous transient evaluation is possible on this period. A limited recovery (c 60 kPa) was obtained during the recovery period.

255.0–355.0 m

The injection period is dominated by a PLF and a transition period towards a possible PRF. The recovery period displays initial WBS followed by a transition to an approximate PRF from c 2,000 s lasting throughout the period. The transient evaluation from the recovery period was selected as the most representative.

355.0–455.0 m

The injection period indicates a PRF between 20 and 1,000 s transitioning to an apparent NFB by the end. During the recovery period WBS is dominating in the beginning, possibly transitioning to an apparent NFB by the end. Transient evaluation with a 2D-model is possible for both the periods.

455.0–555.0 m

The injection period seems to be dominated by a PLF or possibly, an apparent NFB. The recovery period is dominated by PLF. During the recovery period a good type curve fit can be accomplished with a model for a single fracture. Only a limited recovery (c 80 kPa) of the applied injection head of c 210 kPa was achieved during the recovery period.

507.0–607.0 m

The injection period only shows signs of an apparent NFB and no transient evaluation is possible. The recovery period indicates a PLF and transient evaluation results in similar estimates of transmissivity using the Dougherty-Babu 2D-model and the Ozkan-Raghavan model for a single fracture. The responses during the injection- and recovery period were very inconsistent. Only a limited recovery (c 30 kPa) occurred which might indicate a fracture of limited extent or other flow restrictions. Due to the very tight borehole interval below the test section, the pressure applied to expand the packers was reduced to only approximately 10 bars, which is about half the pressure normally applied. Still, the pressure below the test section increased by c 500 kPa in conjunction with the expansion of the packers and does not recover at all for the duration of the test. This fact shows that the borehole interval below the test section is very tight.

55.0–75.0 m

During the injection period, a PRF is present between c 200 and 1,000 s. The relatively low, negative skin factor estimated may indicate a flow regime of lower dimension (PLF) in the beginning, but this period is masked by the pressure regulation, cf the recovery. After the period of PRF an apparent NFB appears. The recovery period exhibits an early PLF transitioning to a short period of PRF lasting from c 50 s to c 200 s. By the end of the period an apparent NFB is indicated. Only a limited recovery (c 160 kPa) of the injection head of c 260 kPa was achieved during the recovery period. The pressure in the section above the test section increased by c 4.4 kPa during the injection period and the pressure in the section below increased by c 5.4 kPa. The transmissivity in the section is lower than the transmissivity above 55.0 m and in the same order of magnitude as the transmissivities below 75.0 m. However these relatively small pressure interferences should not have a major impact on the test performed in the section.

75.0–95.0 m

The injection period is dominated by a PRF followed by an apparent NFB. The PRF lasts between c 100 and 450 s. The recovery period exhibits an initial period of PLF transitioning to a PRF lasting from about 10 s to c 100 s. Following the PRF an apparent NFB appears that lasts for the duration of the recovery period. A limited recovery (c 140 kPa) of the injection head of c 210 kPa was achieved during the recovery period. The pressure in the section above the test section increased by c 8 kPa during the injection period. However, since the transmissivity in the borehole interval below the test section is in the same order of magnitude as the transmissivity in the section 75.0–95.0 m, this relatively small pressure interference should not have a major impact on the test performed in the section.

95.0–115.0 m

The injection period is assumed to be dominated by a PLF transitioning to a PRF at the end. The recovery period indicates a PLF transitioning to an apparent NFB by the end. Evaluations using a single fracture model give similar estimates of transmissivity for both periods as well as evaluations using models assuming pseudo-radial flow for the injection- and recovery period respectively. The pressures both above and below the test section start to decrease from the moment the packers are expanded. This effect has not been clearly explained but different formation pressures and/or the effect from pumping activities in the vicinity are suggested explanations.

115.0–135.0

The pressures both above and below the test section start to decrease from the moment the packers are expanded. This effect has not been clearly explained but different formation pressures and/or the effect from pumping activities in the vicinity are suggested explanations. The pressure in the section P also decreases from test start until the injection period starts. The injection period only displays an apparent NFB and no transient evaluation is possible from this period. The recovery period indicates a PLF transitioning to an apparent NFB. Only a limited recovery (c 70 kPa) was achieved during the recovery period which may indicate flow in a high-transmissive fracture with geometrical restrictions. An unambiguous transient evaluation is not possible on the recovery period and hence, the estimated parameters are considered very uncertain and T_M is chosen as the best estimate of transmissivity for the section.

135.0–155.0 m

A PLF is assumed to dominate both the injection and recovery period. During the injection period the pressure is exhibiting an oscillating behaviour transitioning towards an approximate PRF after c 200 s. Evaluating the injection period using a model for radial flow results in a large, negative skin which strengthens the assumption of a pseudo-linear flow regime.

Also the recovery period indicates a PLF, possibly transitioning to an apparent NFB. Only a limited recovery (c 120 kPa) of the injection head of c 220 kPa was achieved during the recovery period. The pressures both above and below the test section start to decrease from the moment the packers are expanded. This effect has not been clearly explained but different formation pressures and/or the effect from pumping activities in the vicinity are proposed explanations.

155.0–175.0 m

During the injection period a PLF is indicated during the first c 400 s. After this a possible PSF is indicated. Also the recovery period is dominated by a PLF during the first c 400 s and a transition period. The evaluated transmissivities from the injection period and the recovery period are very similar. The pressures both above and below the test section start to decrease from the moment the packers are expanded. This effect has not been clearly explained but lower formation pressure and/or effects from pumping activities in the vicinity are suggested explanations.

175.0–195.0 m

During the injection period a number of valve changes and change of flow meters made the injection pressure rather unstable. The derivative is therefore quite scattered. It is assumed that a PLF dominates during the entire flow period. This assumption is supported by the fact that the recovery period produces a clear PLF. Also the similar transmissivity values gained from the injection period as well as the recovery period using a single fracture model support this interpretation of flow regimes. Due to the unstable pressure during the flow period though, the value of transmissivity from the recovery period is chosen as the most representative for this section. The pressures both above and below the test section start to decrease from the moment the packers are expanded. This effect has not been clearly explained but different formation pressures and/or the effect from pumping activities in the vicinity are proposed explanations.

195.0–215.0 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The pressures both above and below the test section start to decrease from the moment the packers are expanded. This effect has not been clearly explained but different formation pressures and/or the effect from pumping activities in the vicinity are suggested explanations.

215.0–235.0 m

During both the injection and recovery periods, PLF was the dominating flow regime. The test was conducted using the pressure vessel directly. The flow rate was slightly higher than desired for such a test performance. Pressure regulation was therefore partly performed using the gas pressure regulators. Transient evaluation of the recovery period is considered to provide the best estimate of transmissivity for the section. The pressures both above and below the test section start to decrease from the moment the packers are expanded (the pressure below the test section is only weakly affected). This effect has not been clearly explained but lower formation pressure and/or effects from pumping activities in the vicinity are suggested explanations.

235.0–255.0 m

The pressure was not quite stable during the entire injection period. The injection period is assumed to be dominated by an apparent NFB, possibly transitioning to an apparent PLF by the end. An unambiguous transient evaluation is not feasible on the injection period. The recovery period is dominated by a PLF. The total recovery in this high-transmissivity section is only c 50 kPa, indicating a flow feature with geometrical restrictions, e.g. decreasing fracture aperture away from the borehole. The pressure in the section above seems to be affected by some other external activity. The transient evaluation from the recovery period was chosen as the representative evaluation from this test.

255.0–275.0 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The pressure below the test section starts to decrease from the moment the packers are expanded. This effect has not been clearly explained but different formation pressures and/or the effect from pumping activities in the vicinity are proposed explanations. The pressure transducer located above the test section was out of order during the test.

275.0–295.0 m

The injection starts with a PRF after 20 s and is dominating the flow for the remainder of the period. The recovery period begins with a WBS followed by a transition period. At the end of the recovery a short PRF might be assumed but it is not possible to get a good fitting on this part with a model for radial flow. No unambiguous transient evaluation is possible on the recovery period. The transmissivity estimated from the injection period is chosen as the representative for the section.

295.0–315.0 m

The injection period is dominated by a PLF from the start of the injection to c 300 s. From c 300 s to the end of the injection period an apparent NFB is indicated. The first c 80 s of the recovery period is dominated by WBS followed by a PRF from c 300 to 700 s. From c 700 s to the end of the recovery period an apparent NFB is indicated which is consistent with the injection period derivative. The transient evaluation from the recovery period is chosen as the most representative. The transient interpretation is supported by the steady-state evaluation.

315.0–335.0 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

335.0–355.00 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

355.0–375.0 m

The final flow of the injection period is very low and close to the lower test specific measurement limit. A consequence of the low flow is the scattered flow data observed during the injection period making flow regime interpretation hard. Throughout the injection period the flow regime is of lower dimension with signs of a PLF or apparent NFB. No unambiguous transient evaluation is possible on the injection period. The recovery period is dominated by WBS and a transition period but no PRF was reached. Although an unambiguous but uncertain transient evaluation was made on the recovery period the steady-state solution is considered as the most representative.

375.0–395.0 m

A PRF appears after about 40 s of the injection period and may continue for the rest of the period. However, a sign of an apparent NFB is indicated at the end of the period. The recovery period begins with a WBS that turns into an apparent PRF after about 200 s. After c 400 s of the recovery an apparent NFB dominates the remainder of the period.

395.0–415.0 m

A PLF is dominating the injection period. An unambiguous transient evaluation of the injection period is possible with a model assuming flow from a single fracture (i.e. one dimensional flow). The data from the recovery period show a good type curve fit but a PRF is not developed. The transient evaluation of the recovery period is strongly affected by the calculation procedure of the Agarwal equivalent time (multi-rate or injection time). The transient evaluation of the recovery is considered to be the most representative for the tested section.

415.0–435.0 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period.

435.0–455.0 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period.

455.0–475.0 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

475.0–495.0 m

An apparent NFB dominates during the injection period. The flow derivative is decreasing after c 800 s which possibly may indicate a transition to some other flow or alternatively, it may also be an effect of the rather scattered low flow rate towards the end of the test. No unambiguous transient evaluation can be made on the injection period. The recovery period may indicate a PLF but only a limited recovery (c 90 kPa) was achieved during the recovery period. Although the transient evaluation on the recovery period is very uncertain it is considered to be the most representative transmissivity value for this section.

495.0–515.0 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period.

505.0–525.0 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period. Since the measurement noise with a zero flow was centred slightly above zero, the flow rate measurement limit was manually lowered by $2.46 \cdot 10^{-9}$ m^3/s.

515.0–535.0 m

An apparent NFB is dominating the entire injection period. No unambiguous transient evaluation can be made on the injection period. Hence the recovery period is regarded to give the best estimate of transmissivity. The recovery period displays a PLF. Transient evaluations using a PRF- and a single fracture model respectively, give consistent results.

525.5–545.5 m

An apparent NFB dominates the entire injection period. No unambiguous transient evaluation can be made on the injection period. Hence the recovery period is regarded to give the best estimate of transmissivity. The recovery period displays a PLF. Transient evaluations using a PRF- and a single fracture model respectively, give consistent results.

535.0–555.0 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period.

545.5–565.5 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

565.5–585.5 m

The flow rate is quite unstable during the injection period due to difficulties in the regulation of the injection pressure. However, the injection period seems to be dominated by an apparent NFB. The recovery is dominated by a PLF which transitions to a possibly approximate PRF. The total recovery in the test section is only c 30 kPa, indicating a flow feature of geometrical restrictions, e.g. decreasing fracture aperture away from the borehole. No unambiguous transient evaluation can be made on the injection period. Hence the recovery period is regarded to give the best estimate of transmissivity.

585.5–605.5 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period.

10.5–15.5 m

The injection period clearly demonstrates a PRF starting after c 80 s continuing throughout the injection period. Also the recovery period shows a PRF from c 30 s until the end of the recovery period.

15.5–20.5 m

During the later half of the injection period the flow increases slightly. This behaviour could possibly be explained by flushing of drilling debris from conductive fractures. However, it is assumed that a PSF dominates the injection period, possibly transitioning to a PSS by the end. The recovery is very fast and a PSS is the dominating flow regime although a slight increase in pressure was observed by the end. Hence, no unambiguous transient evaluation is possible of the recovery period. An example of analysis of the recovery period is shown in Appendix 3 assuming the same transmissivity and storativity as was estimated from the injection period. The transient evaluation from the injection period is considered as the representative for the test section.

18.0–23.0 m

The flow rate and injection pressure was a bit unsteady during the injection period. Still, the injection period indicates a PSF after c 100 s. After c 700 s of the injection period, the flow rate is increasing despite that the injection pressure is rather constant. This might possibly be an effect of flushing of drilling debris from the fractures. The recovery in this section is very fast and PSS is the dominating flow regime. Hence, no unambiguous transient evaluation of the recovery period is possible. An example of analysis of the recovery period is shown in Appendix 3 assuming the same transmissivity and storativity as was estimated from the injection period. The transient evaluation from the injection period is considered as the representative for the test section.

21.3–26.3 m

The intermediate part of the injection period indicates a PLF. By the end of the injection period a PRF is assumed after c 700 s throughout the period. The recovery period indicates dominating WBS effects during most of the period with a short transition period towards the end. No unambiguous transient evaluation of the recovery period is possible. Therefore, the transient evaluation from the PRF during the injection period is considered as representative for this section.

24.0–29.0 m

The injection period shows a slightly decreasing derivative interpreted as a PSF. Hence, the Hantush model is regarded as the most reliable model for the injection period. The recovery period starts with a short WBS followed by a transition towards a possible PRF.

29.0–34.0 m

The injection period indicates an early PLF which is distorted by the pressure regulation phase followed by an approximate PRF during c 200–500 s. After about 700 s, a PSS is developed. The recovery period also indicates a PLF transitioning to an approximate PRF during c 200–500 s followed by a transition period to a possible PSF towards the end.

34.0–39.0 m

The injection is dominated by a PSF during the entire period. A WBS followed by a transition to a possible PSF dominates the recovery period. No unambiguous transient evaluation can be made on the recovery period. An example of analysis of the recovery period is shown in Appendix 3 assuming the same transmissivity and storativity as was estimated from the injection period. The transient evaluation from the injection period is considered as the representative for the test section.

39.0–44.0 m

The injection period is dominated by a PSF. The first c 200 s of the recovery period is indicating a PLF which then transfers into an apparent CHB by the end of the recovery period. No unambiguous transient evaluation can be made from the recovery period. An example of a transient evaluation of the recovery period is shown in Appendix 3. The transient evaluation from the injection period is considered to be the most representative for this section.

44.0–49.0 m

Although the derivative during the injection period is somewhat unstable, a PRF is assumed to dominate the entire period. The recovery period shows signs of a short PRF between c 15 and 70 s. The PRF transitions to an apparent NFB which turns into a possible PSF at c 400 s until the end of the recovery period. The pressure in the section below the test section increased by c 3 kPa during the injection period. The transmissivity in the section below 49.0 m is higher than the transmissivity in the section 44.0–49.0 m. However this relatively small pressure interference should not have resulted in an overestimation of the transmissivity in this section.

49.0–54.0 m

The injection period initially indicates of a PLF transitioning to a possible PRF lasting between c 600 s and throughout the injection period. The estimated negative skin factor from a PRF model strengthens the assumption of a flow regime of a lower dimension than two, i.e a fracture response. The recovery period only exhibits a PLF. The total recovery in the rather high-transmissive test section is only c 25 kPa, indicating a flow feature of geometrical restrictions, e.g. decreasing fracture aperture away from the borehole. No unambiguous transient evaluation can be made on the recovery period. An example is shown in Appendix 3. The pressure in the section below the test section increased by c 13 kPa during the injection period. Since the transmissivity in the section below 54.0 m is higher than the transmissivity in the section 49.0–54.0 m, this pressure interference may have resulted in an overestimation of the transmissivity in the test section.

52.75–57.75 m

The injection period is dominated by a PRF throughout the period. The first phase of the recovery period is dominated by a PLF with a transition period to an approximate PRF towards the end. Transient evaluations with a PRF model and a single-fracture model of the recovery period give consistent results. The transient evaluation of the injection period is considered as the representative for this section. The pressure in the section above the test section increased by c 6 kPa during the injection period and the pressure in the section below increased by c 5 kPa. The transmissivity in the section above 52.75 m is much higher than the transmissivity in the section 52.75–57.75 m whereas the transmissivity in the section 52.75–57.75 m is in the same order of magnitude as in the section below 57.75 m. However the relatively small pressure interferences above and below the test section should not have a major impact on the test.

55.0–60.0 m

The injection period shows a PRF from c 30 s and throughout the period. During the recovery period an approximate PRF is indicated after c 500 s after initial WBS. The pressure above and below the test section increases immediately from test start (9 kPa and 13 kPa respectively), possibly indicating a higher formation pressure above and below the test section. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit as well as the flow data was manually elevated by $2.07 \cdot 10^{-9}$ m^3/s.

60.0–65.0 m

The injection period demonstrates a PRF between c 100 and 700 s followed by an apparent NFB as reflected by the increasing derivative at the end of the period. After initial WBS, an approximate PRF is visible between c 60–150 s during the recovery period followed by an apparent NFB. Thus, the two periods give consistent results regarding flow regimes. Some interference with the section below is noticed. The pressure increased by c 3 kPa in this section during the injection period. There is also a possible pressure interference with the section above. The pressure increased by c 2 kPa during the injection but it did not recover during the recovery period.

65.0–70.0 m

During the injection period a short PRF is present during c 100–300 s transitioning to PSF. The beginning of the recovery period is dominated by a PLF. A short period of PRF is also indicated between c 100 and 300 s followed by a PSF lasting throughout the period. Transient evaluation using the Hurst-Clark-Brauer model for pseudo-radial flow and the Hantush model for psuedo-spherical flow on the injection period as well as the recovery period provides similar estimates of transmissivity. To obtain a completely unambiguous transient evaluation of the recovery period in this case, the radius of the fictive standpipe had to be assumed at the theoretical value of 0.00022 m which corresponds to the effective wellbore storage coefficient. The transient evaluation of the injection period is considered as the representative evaluation in this case.

70.0–75.0 m

The injection period clearly displays a PRF lasting from 100 s throughout the period. WBS is dominating the recovery period followed by a transition period. The transient evaluation of the injection period is considered as the representative evaluation in this case.

75.0–80.0 m

After an initial period of unstable pressure the injection period may indicate a very short period of PRF from c 100 to 200 s followed by a PLF or alternatively, an apparent NFB after c 200 s. The recovery period shows a similar response with a short apparent PRF between c 10 and 100 s transitioning into an apparent PLF/NFB. Only a limited recovery (c 90 kPa) of the injection head was achieved during the recovery period. The transient evaluations on both the injection and recovery period are regarded as very uncertain. Pressure interference was noticed in both the section above and below the test section. In the section above, the pressure increased by c 5 kPa and in the section below by c 2 kPa. In fact, the pressure interference in the section below is more pronounced than indicated by the increase at the time of the injection start, since there is an ongoing trend with decreasing pressure during the entire test sequence.

80.0–85.0 m

The injection period indicates a dominating PLF as reflected by the negative skin factor, possibly transitioning towards a PRF. Transient evaluation using models for pseudo-radial and pseudo-linear flow, provide relatively consistent estimates of transmissivity. Evaluation assuming a single fracture is regarded as representative for the section. During the recovery period only PLF is visible. Only a limited recovery (c 60 kPa) of the injection head was achieved during the recovery period.

85.0–90.0 m

Due to the scattered flow derivative the interpretation of flow regimes is difficult during the injection period. It is assumed that the entire injection period is dominated by an intermediate flow regime between PLF and PRF. The estimated negative skin factor from a PRF-model indicates the presence of a PLF. The recovery period displays a similar flow regime. Only a limited recovery (c 150 kPa) of the injection head was achieved during the recovery period. The T-value obtained from a PRF-model during the injection period coincides well with the corresponding estimation of transmissivity from the recovery period. Since the interpretation of the injection period is somewhat uncertain, the recovery period is regarded to give the best estimate of transmissivity for the section.

90.0–95.0 m

The injection pressure, and hence the flow rate, was somewhat unstable during the last 5 minutes of the injection due to an unfortunate shift between regulation valves. However, the injection clearly displays an apparent NFB throughout the period. The total recovery in the test section is only c 45 kPa and the period only displays a PLF. No unambiguous transient evaluation can be made on the injection period. Hence the recovery period is regarded to give the best estimate of transmissivity.

95.0–100.0 m

The beginning of the injection period indicates a short PLF/PRF from c 40 to 150 s transitioning to an apparent NFB by the end. The recovery period seems to start with an approximate PRF from c 10 to 100 s transitioning to an apparent NFB. Only a limited recovery (c 90 kPa) of the injection head was achieved during the recovery period. The transient evaluations of both the injection and recovery period are uncertain. However the transient evaluation from the injection period is considered as the representative for the section.

100.0–105.0 m

After c 250 s of the injection period there was an unfortunate change of valves causing a disturbance in both pressure and flow data. Although the flow derivative is scattered it is assumed that the entire injection period is dominated by a PSF. Also the recovery period clearly displays a PSF during the entire period. The apparent flattening out of the derivative by the end of the recovery period is probably only effects of the limited resolution of the pressure sensor.

105.0–110.0 m

During the injection period a PLF is observed, possibly transitioning to an apparent NFB at the end of the period. The recovery period displays a similar flow regime. Only a limited recovery (c 140 kPa) of the injection head was achieved during the recovery period which possibly may indicate flow in a single fracture of decreasing aperture. The transient evaluations of both the injection and recovery period are uncertain. However, the transient evaluation from the injection period is considered as the representative for the section.

110.0–115.0 m

After a relatively long time to achieve a constant pressure in the section an approximate PRF is indicated after c 200 s during the entire injection period, although the derivative decreases slightly at the end. The increasing derivative in the beginning of the period and the estimated negative skin factor from a PRF-model indicate the presence of an early PLF which may be masked during the pressure regulation phase. The recovery period indicates a PLF/NFB. Only a limited recovery (c 100 kPa) of the injection head was achieved during the recovery period. No unambiguous transient evaluation can be made on this period. An example of a transient evaluation of the recovery period is shown in Appendix 3, assuming the same transmissivity and storativity as were estimated from the injection period.

115.0–120.0 m

After a change of valves the pressure increased c 4 kPa, but since the injection period only displays an apparent NFB, this fact does not affect the possibility to evaluate the test. The recovery period clearly shows a PLF and a good conformance to the Ozkan-Raghavan model for a single fracture. The total recovery in this section, with rather high transmissivity, is only c 50 kPa, indicating a flow feature of limited extension, e.g. decreasing fracture aperture away from the borehole. The transient evaluation from the recovery period is considered as the representative for the section.

120.0–125.0 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

125.0–130.0 m

The pressure in the section below the test section increased by c 3 kPa during the injection period. The transmissivity in the section below 130.0 m is much higher than the transmissivity in the section 125.0–130.0 m. However this relatively small pressure interference should not have resulted in an overestimation of the transmissivity in this section. The flow during the injection period begins with a rather long transition into a PLF followed by a PRF after c 700 s, continuing throughout the period. The transient evaluation with the Hurst-Clark-Brauer method gives a low negative skin value, indicating an initial flow regime of lower dimension. Using a model for linear flow for a single fracture provides a transmissivity in accordance with the Hurst-Clark-Brauer model. The recovery is dominated by a transition period to a possible PLF/NFB by the end. Only a limited recovery (c 130 kPa) of the injection head was achieved during the recovery period. The transient evaluation from the injection period using a single fracture model is considered as the representative for the section.

130.0–135.0 m

The pressure in the section above the test section increased by c 5.9 kPa during the injection period. Since the transmissivity in the section above 130.0 m is much higher than the transmissivity in the section 130.0–135.0 m, this pressure interference may have resulted in an overestimation of the transmissivity in the test section. The flow regimes identified, as well as the estimated T-values in these sections, are quite similar, indicating that the same hydraulic feature probably is measured during these two tests. During the injection period a PLF is dominating. The recovery period indicates a PLF transitioning to an apparent NFB. Only a limited recovery (c 120 kPa) of the injection head was achieved during the recovery period. The transient evaluation from the injection period using a single fracture model is considered as the representative for the section.

135.0–140.0 m

The injection period indicates an apparent NFB possibly transitioning to a PLF at the end. As seen on the overview plot, the pressure in the section was slightly increasing during the test (c 1.5 kPa) which may possibly result in the apparent PLF at the end of the injection period. No unambiguous transient evaluation can be made on the injection period. The recovery period only shows a PLF. The total recovery in the section is only c 50 kPa. The transient evaluation from the recovery period is considered as the representative for the section.

140.0–145.0 m

The flow rate is low, close to the measurement limit, and hence the data, especially the flow derivative, are quite scattered. A weak indication of a PRF is yet identified during the injection period. The recovery period is dominated by WBS and a short transition period but an unambiguous transient evaluation is possible on this period. Since the flow data from the injection period are very scattered, the recovery period is regarded to provide the best estimate of transmissivity in the section.

145.0–150.0 m

The injection period indicates a possible PLF from c 100 s. The recovery period also indicates a PLF throughout the period. The best transient evaluation was made during the injection period which therefore is considered as the most representative.

150.0–155.0 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

155.0–160.0 m

The injection period indicates a possible initial PLF transitioning to a late PRF starting after 600 s continuing throughout the period. The recovery period indicates a PLF/NFB transitioning to a PSF at the end. The transient evaluation of the recovery period is uncertain. The transient evaluation on the late part of the injection period is considered as the representative evaluation for this section.

160.0–165.0 m

Due to a poor regulation of the injection pressure the time to achieve a stable injection pressure was unusually long for this test. During the injection period a flat derivate is observed, indicating a PRF although transient evaluation using a model by Hurst-Clark-Brauer results in a high positive skin which may indicate a flow dimension of higher dimension. The recovery period shows a rapidly decreasing derivative and is hence interpreted as a PSS. No unambiguous transient evaluation could be made on the recovery period. An example evaluation of the recovery is shown in Appendix 3. Since the transient evaluations during both the injection- and recovery period are uncertain, T_M was considered to be the most representative transmissivity value for this section. The pressure above and below the test section increases immediately from test start (8 kPa and 4 kPa respectively), possibly indicating higher formation pressure above and below the test section.

165.0–170.0 m

During the injection period a PSF may be interpreted from c 650 s throughout the period. After c 9 minutes of the injection period a change of valves occurred, causing a disturbance of both pressure and flow data. The recovery period displays a PLF possibly transitioning to an apparent NFB. Only a limited recovery (c 150 kPa) of the injection head was achieved during the recovery period. No unambiguous transient evaluation is possible on the recovery period. Although somewhat uncertain, the transient evaluation on the injection period is considered as the most representative estimate of transmissivity for the section.

170.0–175.0 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period. Since the measurement noise with a zero flow was centred slightly below zero, the flow rate measurement limit as well as the flow data were manually elevated by $2.46 \cdot 10^{-9}$ m^3/s.

175.0–180.0 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

180.0–185.0 m

The injection period starts with a PLF transitioning to a possible PRF. After c 400 s an apparent NFB appears. The recovery period shows a PLF transitioning into a clear PRF starting after 200 s continuing throughout the period. Only a limited recovery (c 120 kPa) of the injection head was achieved during the recovery period. Although the transient evaluations from both periods are consistent, the transient evaluation on the recovery period is considered as the most representative estimate of transmissivity since a clear PRF can be identified from this period.

185.0–190.0 m

The injection period only displays an apparent NFB. Hence transient evaluation of this period is not possible. The recovery period is dominated by a PLF and transient evaluation using the Ozkan-Raghavan model for a single fracture provides the estimate of transmissivity considered as the most representative for this section. The total recovery was only c 80 kPa in this low-transmissive section.

190.0–195.0 m

The derivative is quite scattered. Still a PRF is indicated starting after 20 s and continuing to c 1,000 s. After 1,000 s. the derivative is increasing, indicating an apparent NFB. During the recovery period WBS transitioning to an approximate PRF is observed. Transient evaluation resulting in similar estimates of transmissivity is possible on both the periods. The transient evaluation on the injection period is considered as the representative for the section.

215.0–220.0 m

The injection period is dominated by an apparent NFB. The recovery period exhibits only WBS and a transition period. No unambiguous transient evaluations are possible on neither the injection nor the recovery period. Example evaluations of the injection and recovery are demonstrated in Appendix 3. They are mainly aimed to show that the section has a low transmissivity. Since no transient evaluations could be made on any period, T_M was considered to be the most representative transmissivity value for this section. As before, the pressure above and below the test section increases immediately from test start (10 kPa and 4 kPa respectively).

220.0–225.0 m

The injection period indicates a PLF transitioning towards a PRF. During the recovery period a PLF is transitioning to a short PRF followed by an apparent NFB after c 200 s. The best estimate of transmissivity is considered from the injection period.

225.0–230.0 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

230.0–235.0 m

The injection period only displays an apparent PLF. No unambiguous transient evaluation can be made on this period due to the low transmissivity but an example analysis is presented in Appendix 3. The recovery period also indicates a PLF with features of WBS. The transient evaluation from the recovery period is considered as the most representative estimate of transmissivity for the section.

235.0–240.0 m

The time required to achieve a constant pressure in the test section was longer than usual, and as a consequence the data curve (head/flow rate) is oscillating and the derivative is quite scattered. Still, signs of a PRF with features of a PLF (reflected by the negative skin factor) are observed from c 100 s and throughout the period. Transient evaluation using a model for pseudo-linear flow of the injection period is regarded to give the best estimate of transmissivity in the section. During the recovery period only WBS and a transition period is observed and the transient evaluation is considered uncertain.

240.0–245.0 m

After c 470 s of the injection period a change from the bigger flow meter (Qbig) to the smaller flow meter (Qsmall) caused a discontinuous data curve of head/flow rate. This fact does however not affect the evaluation of the test. A PRF is identified between c 40 and 300 s. After the PRF the derivative is increasing which indicates an apparent NFB. During the recovery period a PRF (between 10 and 250 s) transitioning to an apparent PLF/NFB is observed. Although the transient evaluations on both periods all result in similar estimates of transmissivity, the evaluation using the model for pseudo-radial flow (PRF) on the injection period is considered to provide the most representative T-value for this section.

245.0–250.0 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

250.0–255.0 m

The flow rate was very large in the beginning and then rapidly decreased, making it difficult to keep the pressure stable without disturbing the flow. Hence the flow derivative is quite scattered. As indicated by the rapidly decreasing flow rate the injection period demonstrates an apparent NFB/PLF. No unambiguous transient evaluation is possible on this period. An example of transient evaluation of the injection period is shown in Appendix 3. The total recovery in this section, with rather high transmissivity, is only c 30 kPa of the applied head change of c 130 kPa, indicating a flow feature of limited extension, e.g. decreasing fracture aperture away from the borehole. The recovery period indicates a PLF and transient evaluation from the recovery period is regarded as the most representative estimate of transmissivity for this section.

275.0–280.0 m

During the injection period a PRF appears between c 20 and 500 s transitioning to an apparent NFB by the end. The recovery period shows the same flow regimes after an initial period of WBS lasting until 20 s. The period of PRF during the recovery period is short (250–450 s) transitioning to an apparent NFB by the end. Transient evaluation from both periods provides similar estimates of transmissivity, but the evaluation from the injection period is chosen as the representative for the section.

280.0–285.0 m

The flow rate is low, close to the measurement limit and hence the data, especially the flow derivative, is quite scattered. Despite this fact, evidence of a PRF is noticed during the injection period. The recovery period displays a WBS transitioning to some other flow regime. No unambiguous transient evaluation is possible from the recovery period. An example of transient evaluation of the recovery period is shown in Appendix 3, assuming the same T and S as was obtained from the injection period.

285.0–290.0 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section.

290.0–295.0 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery showed a slow pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period.

373.0–378.0 m

The test section has a low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. Since the measurement noise with a zero flow was centred slightly above zero, the flow rate measurement limit was manually lowered by $1.23 \cdot 10^{-9}$ m^3/s.

378.0–383.0 m

The injection period shows indications of a PRF from 30 to 400 s. Then the derivative increases, pointing to an apparent NFB. The recovery period indicates WBS followed by a short PRF. At the end of the period, an apparent NFB is weakly indicated. Evaluation using a PRF-model results in a high positive skin factor. Transient evaluation from the injection period is considered the best estimate of transmissivity for the section. The pressure in the section below the test section increased by c 4 kPa during the injection period. However, since the transmissivity in the borehole interval above the test section is in the same order of magnitude as the transmissivity in the section 378.0–383.0 m, this relatively small pressure interference should not have a major impact of the test performed in the section.

383.0–388.0 m

The injection period clearly demonstrates a PRF from c 50 s and throughout the period. During the recovery period WBS is transitioning to a PRF after c 200 s lasting throughout the period. The evaluation from the injection period is chosen as the one providing the best estimate of transmissivity.

388.0–393.0 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period.

393.0–398.0 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period. Since the measurement noise with a zero flow was centred slightly above zero, the flow rate measurement limit was manually lowered by $2.43 \cdot 10^{-9}$ m^3/s.

475.0–480.0 m

The injection period indicates an intermediate flow regime between a PLF and an apparent NFB and only an approximate transient evaluation is possible. From the recovery period a PLF is identified and transient evaluation is possible using both the Ozkan-Raghavan model and the Dougherty-Babu model. However, the last one provides a large negative skin and is therefore considered uncertain. The estimate of T using the Ozkan-Raghavan model from the recovery period is hence considered to be the best estimate of transmissivity in the section.

480.0–485.0 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period.

485.0–490.0 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period.

490.0–495.0 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period.

515.0–520.0 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period.

520.0–525.0 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period.

525.0–530.0 m

The injection period starts with a PLF that turns into an apparent NFB after about 70 s. This change in flow makes an unambiguous transient evaluation of the injection period difficult. The recovery also begins with a PLF and then turns into a transition state to a possible apparent NFB. The transient evaluation from the recovery period is considered the most representative estimate of T for the section. The negative skin factor implies a flow regime of lower dimension, suggesting a single fracture model.

530.0–535.0 m

The section has a low transmissivity and the flow data, especially the derivative, are very scattered. The injection period begins with an assumed PRF starting after about 30 s and lasting until c 500 s. After this time, an apparent NFB is indicated. The recovery period begins with a WBS followed by a transition period. The transient evaluation of the recovery period is regarded as representative for the section.

564.5–569.5 m

The pressure in the section below the test section increased by c 191 kPa during the injection period. Since the transmissivity in the borehole interval above the test section is in the same order of magnitude as the transmissivity in the section 564.5–569.5 m, this relatively large pressure interference may have a major impact of the test. This fact indicates a hydraulic shortcut around the lower packer which strongly affected the test and the results. The injection period shows a steeply increasing derivative, indicating an apparent NFB. The recovery is dominated by a PLF but it is not possible to get a satisfactory transient evaluation of the period, and thus T_M is chosen as representative for this section.

569.5–574.5 m

The injection period is dominated by a PLF. Thus, the transient evaluation on this period was made according to a single-fracture model. The recovery period also indicates a PLF. The transient evaluation on the injection period was considered to be the representative for this section.

574.5–579.5 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period. P_b increases from packer expansion (c 270 kPa) to packer deflation, indicating that the section below the test section is also of such low transmissivity that packer expansion affects the pressure throughout the period.

579.5–584.5 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period. P_b increases from packer expansion (c 370 kPa) to packer deflation, indicating that the section below the test section is also of such low transmissivity that packer expansion affects the pressure throughout the period.

584.5–589.5 m

The test section has a very low transmissivity. Since the flow rate was not detectable, neither steady-state nor transient evaluation of transmissivity was possible. Hence, in accordance with AP PF 400-06-003, the injection time was shortened. As a result T_M, based on Q/s-measl-L, was considered to be the most representative transmissivity value for this section. The period of measured recovery only showed a pressure increase, indicating that the section is of such low transmissivity that packer expansion affects the pressure throughout the period. P_b increases from packer expansion (c 291 kPa) to packer deflation, indicating that the section below the test section is also of such low transmissivity that packer expansion affects the pressure throughout the period.

6.2.5 Flow regimes

A summary of the frequency of identified flow regimes on different scales is presented in Table 6-3, which shows all identified flow regimes during the tests. For example, a pseudo-radial flow regime (PRF) transitioning to a pseudo-spherical flow regime (PSF) will contribute to one observation of PRF and one observation of PSF. The numbers within parenthesis denote the number of tests where the actual flow regime is the only one present.

It should be noted that the interpretation of flow regimes is only tentative and just based on visual inspection of the data curves. It should also be observed that the number of tests with a pseudo-linear flow regime during the beginning of the injection period may be under-estimated due to the fact that a certain time is required for achieving a constant pressure, which fact may mask the initial flow regime.

Table 6-3 shows that a certain period of pseudo-radial flow could be identified from the injection period in c 49% of the tests with a definable final flow rate for KFM09B. This percentage is higher for the tests in 5 m sections compared to the tests in 20 m and 100 m. For the recovery period, the corresponding result is c 31%. It should be observed that the measured borehole intervals with 5 m, 20 m and 100 m sections are slightly different in KFM09B, see Table 6-3.

For c 54% of the tests in the borehole, more than one flow regime could be identified. The most common transitions in KFM09B during the injection and recovery period were from pseudo-radial flow to an apparent no-flow boundary. During the injection period intermediate flow regimes between PLF/PRF as well as an intermediate regime between PLF/NFB and transitions from PLF to PRF were also quite common. However, throughout the recovery period transitions from PLF to NFB, WBS to PRF and PLF to PRF appeared rather frequently.

6.3 Comparison of transmissivity values on different test scales

The transmissivity values considered the most representative, T_R, from the injection tests in KFM09B in the tested sections of 100 m, 20 m and 5 m length, respectively, are shown in Figure 6-2. This figure demonstrates a good agreement between results obtained from tests on different scales in KFM09B. A consistency check of the transmissivity values on the different scales was made by summation of calculated values from smaller scales (20 m and 5 m) and comparing with the estimated values in longer sections (100 m and 20 m).

Table 6-3. Interpreted flow regimes during the injection tests in KFM09B.

Section length (m)	Number of tests	Borehole interval (m)	Number of tests with definable Q_p	Injection period					Recovery period					
				PLF	PRF	PSF	PSS	NFB	WBS	PLF	PRF	PSF	PSS	NFB
5	69	10.5 –589.5	50	21(4)	29(10)	8(6)	2(0)	19(5)	15(8)	28(13)	17(1)	6(1)	3(3)	15(0)
20	30	55.0 –605.5	18	9(3)	6(1)	1(0)	0(0)	11(5)	5(3)	13(7)	5(0)	0(0)	0(0)	7(0)
100	6	55.0 –607	6	4(4)	1(0)	0(0)	0(0)	2(1)	2(0)	4(4)	1(0)	0(0)	0(0)	1(0)

In Table 6-4, estimated transmissivity values in 100 m and 20 m test sections in KFM09B according to steady-state (T_M) and most representative evaluation (T_R) are listed together with summed transmissivities in 20 m and 5 m sections over the corresponding 100 m and 20 m sections. However the transmissivities for 5 m sections in the short interval 10.5–55.0 m are not presented. When the transmissivity values are below the measurement limit (Q_p could not be defined), the most representative transmissivity value, T_R, was considered to be less than T_M, based on Q/s-measl-L, for the test section. The measurement limit values are included in the summed values in Table 6-4. This leads to overestimated values of the summed transmissivities.

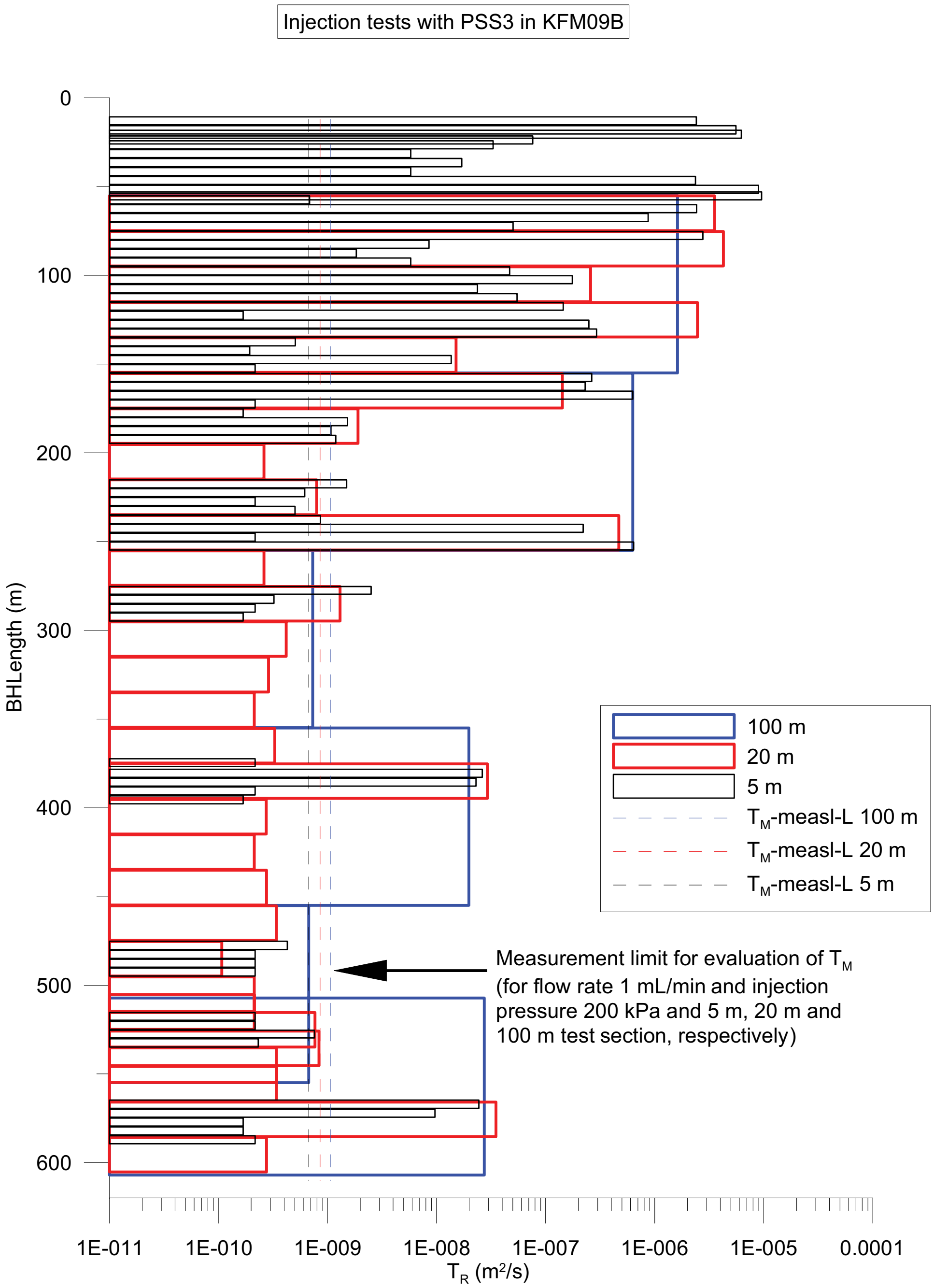

Figure 6-2. *Estimated best representative transmissivity values (T_R) for sections of 100 m, 20 m and 5 m length in borehole KFM09B. Estimated transmissivity values for the lower standard measurement limit from stationary evaluation (T_M-measl-L) for different test section lengths are also shown.*

Table 6-4. Estimated transmissivity values in 100 m and 20 m test sections together with summed up transmissivity values in 20 m and 5 m sections in the corresponding borehole intervals from the injection tests in KFM09B.

Borehole Idcode	Secup Inj.test (m)	Seclow inj.test (m)	L_w (m)	T_M inj. tests (m²/ s)	T_R inj. tests (m²/s)	SUM T_M(20m) inj. Tests (m²/s)	SUM T_R(20m) inj. tests (m²/s)	SUM T_M(5m) inj. tests (m²/s)	SUM T_R(5m) inj. Tests (m²/s)
KFM09B	55.00	155.00	100.00	1.64E–05	1.62E–06	1.71E–05	1.06E–05	1.42E–05	7.13E–06
KFM09B	155.00	255.00	100.00	3.51E–06	6.30E–07	2.85E–06	6.13E–07	2.39E–06	2.00E–06
KFM09B	255.00	355.00	100.00	3.62E–09	7.32E–10	3.58E–09	2.48E–09	2.80E–09	3.22E–09
KFM09B	355.00	455.00	100.00	4.01E–08	1.98E–08	4.15E–08	3.03E–08	3.76E–08	4.98E–08
KFM09B	455.00	555.00	100.00	2.57E–09	6.74E–10	3.30E–09 [1]	1.77E–09 [1]	2.95E–09	2.51E–09
KFM09B	507.00	607.00	100.00	2.25E–08	2.74E–08	2.53E–08 [1,2]	3.67E–08 [1,2]	6.94E–08	3.60E–08
KFM09B	55.00	75.00	20.00	5.86E–06	3.53E–06			4.70E–06 [1]	3.34E–06 [1]
KFM09B	75.00	95.00	20.00	7.80E–06	4.28E–06			5.47E–06	2.78E–06
KFM09B	95.00	115.00	20.00	8.80E–07	2.59E–07			7.55E–07	3.01E–07
KFM09B	115.00	135.00	20.00	2.47E–06	2.47E–06			3.25E–06	6.88E–07
KFM09B	135.00	155.00	20.00	8.60E–08	1.51E–08			6.09E–08	1.46E–08
KFM09B	155.00	175.00	20.00	1.19E–06	1.42E–07			1.04E–06	1.12E–06
KFM09B	175.00	195.00	20.00	5.81E–09	1.90E–09			5.39E–09	3.96E–09
KFM09B	195.00	215.00	20.00	<2.61E–10	<2.61E–10			n.m. 5 m.	n.m. 5 m.
KFM09B	215.00	235.00	20.00	7.34E–09	7.97E–10			5.77E–09	2.84E–09
KFM09B	235.00	255.00	20.00	1.65E–06	4.68E–07			1.34E–06	8.66E–07
KFM09B	275.00	295.00	20.00	2.21E–09	1.30E–09			2.80E–09	3.22E–09
KFM09B	295.00	315.00	20.00	6.07E–10	4.19E–10			n.m. 5 m.	n.m. 5 m.
KFM09B	315.00	335.00	20.00	<2.87E–10	<2.87E–10			n.m. 5 m.	n.m. 5 m.
KFM09B	335.00	355.00	20.00	<2.14E–10	<2.14E–10			n.m. 5 m.	n.m. 5 m.
KFM09B	355.00	375.00	20.00	3.27E–10	3.27E–10			n.m. 5 m.	n.m. 5 m.
KFM09B	375.00	395.00	20.00	3.98E–08	2.93E–08			3.76E–08 [2]	4.98E–08 [2]
KFM09B	395.00	415.00	20.00	9.27E–10	2.75E–10			n.m. 5 m.	n.m. 5 m.
KFM09B	415.00	435.00	20.00	<2.13E–10	<2.13E–10			n.m. 5 m.	n.m. 5 m.
KFM09B	435.00	455.00	20.00	<2.76E–10	<2.76E–10			n.m. 5 m.	n.m. 5 m.
KFM09B	455.00	475.00	20.00	<3.41E–10	<3.41E–10			n.m. 5 m.	n.m. 5 m.
KFM09B	475.00	495.00	20.00	1.30E–09	1.07E–10			1.63E–09	1.08E–09
KFM09B	495.00	515.00	20.00	<2.13E–10	<2.13E–10			n.m. 5 m.	n.m. 5 m.
KFM09B	505.00	525.00	20.00	<2.13E–10	<2.13E–10			1.32E–09	1.42E–09
KFM09B	515.00	535.00	20.00	1.10E–09	7.69E–10			n.m. 5 m.	n.m. 5 m.
KFM09B	525.50	545.50	20.00	1.00E–09	8.34E–10			n.m. 5 m.	n.m. 5 m.
KFM09B	535.00	555.00	20.00	<3.41E–10	<3.41E–10			n.m. 5 m.	n.m. 5 m.
KFM09B	545.50	565.50	20.00	<3.41E–10	<3.41E–10			n.m. 5 m.	n.m. 5 m.
KFM09B	565.50	585.50	20.00	2.34E–08	3.50E–08			6.81E–08 [2]	3.46E–08 [2]
KFM09B	585.50	605.50	20.00	<2.76E–10	<2.76E–10			n.m. 5 m.	n.m. 5 m.

1) Partly overlapping sections.
2) Measured intervals not identical.
n.m. = not measured.

In Figure 6-3, transmissivity values considered as the most representative for 100 m and 20 m sections (T_R-100 m and T_R-20 m, respectively) in KFM09B are plotted versus the sum of the transmissivity values considered most representative in 5 m sections in the corresponding intervals (SUM T_R-5 m). The lower measurement limit of T_M for the different section lengths (Q_p = 1 ml/min and an assumed pressure difference of 200 kPa) together with the cumulative measurement limit for the sum of 5 m sections are also shown in the figure. However, the transmissivity for 5 m sections in the interval 10.5–55.0 m are not presented in this diagram.

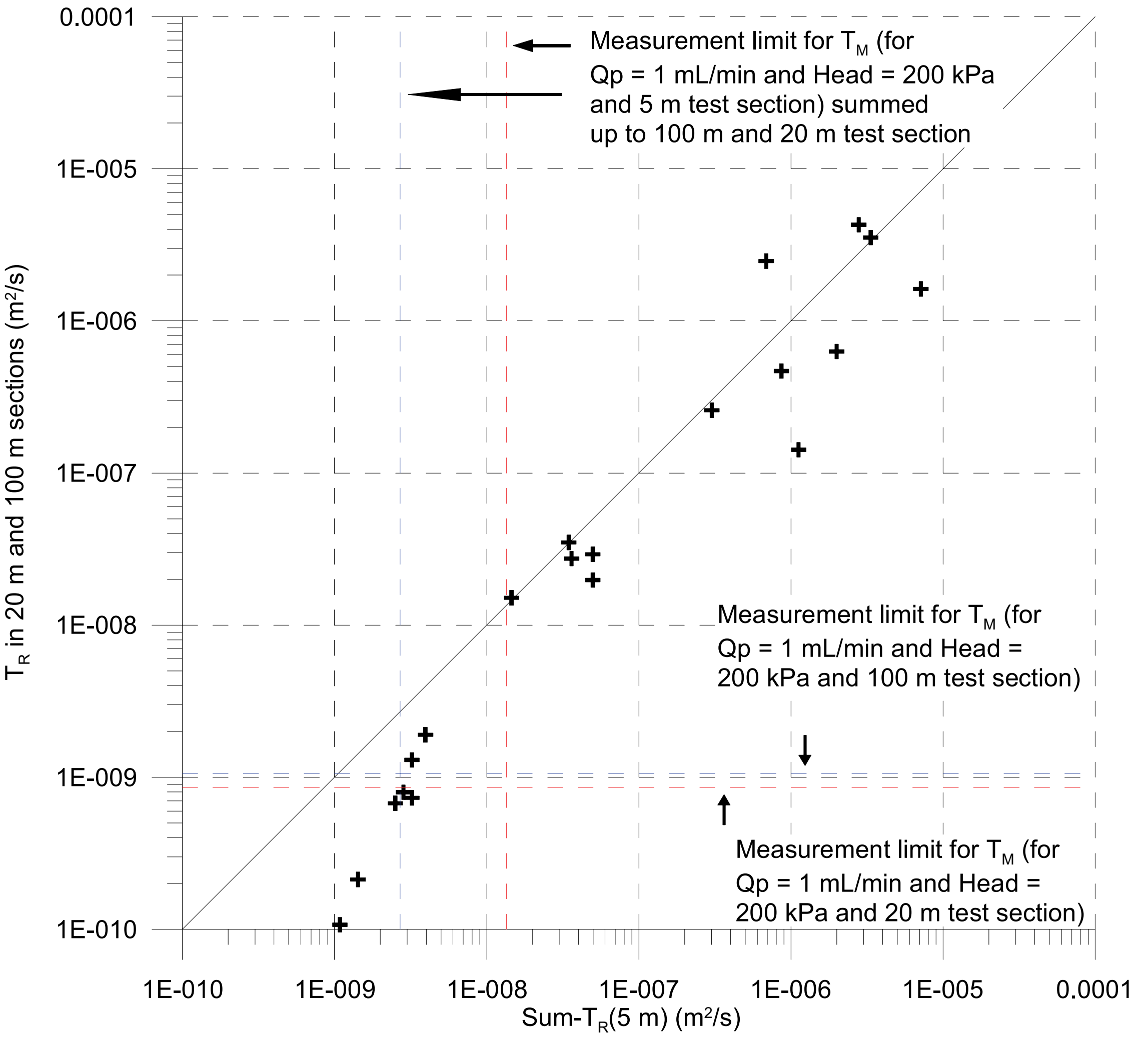

Figure 6-3. *Transmissivity values considered most representative (T_R) for 100 m and 20 m sections versus the sum of most representative transmissivity values (T_R) in 5 m sections in the corresponding borehole intervals from the injection tests in KFM09B together with the standard lower measurement limit at different scales.*

Figure 6-3 indicates a relatively good agreement between estimated transmissivity values in longer sections and summed transmissivity values in corresponding 5 m sections for the injection tests, except for low transmissivities. However, a majority of the data points are located below the straight line, indicating that the sum of the transmissivity from the shorter sections is generally higher than the estimated transmissivity in longer sections. Some of the sections are partly overlapping, resulting in an overestimation when summing the sections together. Also hydraulic interference between adjacent sections can contribute to an overestimation of the sum of transmissivity when summing the transmissivity from several sections together. Since the measurement limit values are summed up, the sum of T in shorter sections can become higher than the estimated transmissivity value in the longer section for very low conductive sections. There might also be other reasons for discrepancies.

Interference is noticed in the 5 m section between 125.0–130.0 m and 130.0–135.0 m, both within the same 20 m section 115.0–135.0 m. Some other sections where interferences are noticed are between section 49.0–54.0 m and the section below this section, between section 75.0–80.0 m and the section above and between section 564.5–569.5 m and the section below.

In Table 6-5 a comparison of the sum of estimated transmissivity values from injection tests with different section lengths in KFM09B is presented. The sum of the transmissivities in the 5 m sections between 10.5–55.0 m are also presented in the table. It should be observed that the summed transmissivity values only include the tests actually performed for each section length. However, the most conductive sections are measured. It is also important to point out that this is a very rough way of comparing the tests in different test scales, since no consideration to overlapping sections are made. The tendency that the sum of transmissivities from shorter sections is bigger than the transmissivity in the corresponding longer section can however be seen between 100 m and 20 m sections on T_R in Table 6-5.

The total transmissivity of KFM09B is dominated by the intervals between 15.5–23.0 m and 49.0–57.75 m.

The steady-state transmissivity T_M may be overestimated if a measured section shows a fractured response (PLF) with a highly negative skin factor. The sum of T_M from the 100 m sections differs significantly from the sum of T_R from the same 100 m sections. This is most likely due to an overestimation of T_M in the upper 100 m sections since these sections were very conductive and indicated a PLF with highly negative skin factors.

6.4 Basic statistics of hydraulic conductivity distributions in different scales

Some basic statistical parameters were calculated for the steady-state hydraulic conductivity (K_M) distributions in different scales (100 m, 20 m and 5 m) from the injection tests in borehole KFM09B. The hydraulic conductivity is obtained by dividing the transmissivity by the section length, in this case T_M/L_w. Results from tests where Q_p was below the estimated test-specific measurement limit were not included in the statistical analyses of K_M. The same basic statistical parameters were derived for the hydraulic conductivity considered most representative ($K_R = T_R/L_w$), including all tests. In the statistical analysis, the logarithm (base 10) of K_M and K_R was used. Selected results are shown in Table 6-6. It should be noted that the statistics for the different section lengths is based on different borehole intervals.

Table 6-5. Comparison of calculated transmissivity values from tests with different section lengths in borehole KFM09B.

Sum of T (m^2/s)	Borehole interval (m)	
	55.0–607.0[1)]	10.5–57.75[1)]
$\sum T_M$(100 m)	2.00E–05	
$\sum T_R$(100 m)	2.30E–06	
$\sum T_M$(20 m) [2)]	2.00E–05	
$\sum T_R$(20 m) [2)]	1.12E–05	
$\sum T_M$(5 m) [3), 4)]	1.67E–05	9.38E–05
$\sum T_R$(5 m) [3), 4)]	9.22E–06	3.52E–05

[1)] Tests measured with all section lengths contain partly overlapping sections.
[2)] Actual measured interval was 55.0–605.5 m.
[3)] Actual measured interval was 55.0–589.5 m.
[4)] Tests with section length 5 m are not performed in all 20 m sections.

Table 6-6. Basic statistical parameters for steady-state hydraulic conductivity (K_M) and hydraulic conductivity considered most representative (K_R) in borehole KFM09B. L_w = section length, m = arithmetic mean, s = standard deviation.

Parameter	**Unit**	**KFM09B L_w = 100 m**	**KFM09B L_w = 20 m**	**KFM09B L_w = 5 m**
Measured borehole interval	m	55.0–607.0 [2]	55.0–605.5 [3]	10.5–589.5 [4], [5]
Number of tests	–	6	30	69
N:o of tests below E.L.M.L.[1]	–	0	12	19
m (Log10(KM))	Log10(m/s)	–9.05	–8.82	–8.01
s (Log10(KM))	–	1.58	1.53	1.41
m (Log10(KR))	Log10(m/s)	–9.59	–9.87	–8.84
s (Log10(KR))	–	1.42	1.45	1.52

[1] Number of tests where Q_p could not be defined (E.L.M.L. = estimated test-specific lower measurement limit).
[2] Sections 455.0–555.0 m and 507.0–607.0 m are partly overlapping.
[3] The following sections are partly overlapping: 495.0–515.0 m and 505.0–525.0 m, 505.0–525.0 m and 515.0–535.0 m, 515.0–535.0 m and 525.5–545.5 m, 525.5–545.5 m and 535.0–555.0 m, 535.0–555.0 m and 545.5–565.5 m.
[4] Sections with very low or non-detectable flow (with 20 m section length) are not measured with 5 m section length.
[5] The following sections are partly overlapping: 15.5–20.5 m and 18.0–23.0 m, 18.0–23.0 m and 21.3–26.3 m, 21.3–26.3 m and 24.0–29.0 m, 49.0–54.0 m and 52.75–57.75 m, 52.75–57.75 m and 55.0–60.0 m.

7 References

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APPENDIX 1. File description table

Bh id	Test section		Test type	Test no	Test start Date, time	Test stop Date, time	Data files of raw and primary data	Parameters in file	Comments
idcode	(m)	(m)	(1-6)[1)]		YYYYMMDD hh:mm	YYYYMMDD hh:mm	__Borehole id_secup_date and time of test start		
KFM09B	55.00	155.00	3	1	20060209 14:28	20060209 16:28	__KFM09B_0055.00_200602091428.ht2	P, Q, Te	
KFM09B	155.00	255.00	3	1	20060210 07:19	20060210 09:07	__KFM09B_0155.00_200602100719.ht2	P, Q, Te	
KFM09B	255.00	355.00	3	1	20060210 10:06	20060210 10:57	__KFM09B_0255.00_200602101006.ht2	P, Q, Te	Interrupted[2)]
KFM09B	255.00	355.00	3	2	20060210 10:59	20060210 11:11	__KFM09B_0255.00_200602101059.ht2	P, Q, Te	Interrupted[2)]
KFM09B	255.00	355.00	3	3	20060210 11:13	20060210 13:01	__KFM09B_0255.00_200602101113.ht2	P, Q, Te	
KFM09B	355.00	455.00	3	1	20060210 13:47	20060210 15:35	__KFM09B_0355.00_200602101347.ht2	P, Q, Te	
KFM09B	455.00	555.00	3	1	20060213 09:33	20060213 11:23	__KFM09B_0455.00_200602130933.ht2	P, Q, Te	
KFM09B	507.00	607.00	3	1	20060213 12:25	20060213 13:37	__KFM09B_0507.00_200602131225.ht2	P, Q, Te	Interrupted[2)]
KFM09B	507.00	607.00	3	2	20060213 14:06	20060213 15:58	__KFM09B_0507.00_200602131406.ht2	P, Q, Te	
KFM09B	55.00	75.00	3	1	20060215 13:24	20060215 15:07	__KFM09B_0055.00_200602151324.ht2	P, Q, Te	
KFM09B	75.00	95.00	3	1	20060215 15:33	20060215 16:52	__KFM09B_0075.00_200602151533.ht2	P, Q, Te	
KFM09B	95.00	115.00	3	1	20060215 17:22	20060215 18:39	__KFM09B_0095.00_200602151722.ht2	P, Q, Te	
KFM09B	115.00	135.00	3	1	20060216 07:23	20060216 08:41	__KFM09B_0115.00_200602160723.ht2	P, Q, Te	
KFM09B	135.00	155.00	3	1	20060216 09:03	20060216 10:20	__KFM09B_0135.00_200602160903.ht2	P, Q, Te	
KFM09B	155.00	175.00	3	1	20060216 10:38	20060216 11:58	__KFM09B_0155.00_200602161038.ht2	P, Q, Te	
KFM09B	175.00	195.00	3	1	20060216 12:48	20060216 14:07	__KFM09B_0175.00_200602161248.ht2	P, Q, Te	
KFM09B	195.00	215.00	3	1	20060216 14:33	20060216 15:28	__KFM09B_0195.00_200602161433.ht2	P, Q, Te	
KFM09B	215.00	235.00	3	1	20060216 16:02	20060216 17:24	__KFM09B_0215.00_200602161602.ht2	P, Q, Te	
KFM09B	235.00	255.00	3	1	20060217 08:34	20060117 09:54	__KFM09B_0235.00_200602170834.ht2	P, Q, Te	
KFM09B	255.00	275.00	3	1	20060217 10:18	20060217 11:39	__KFM09B_0255.00_200602171018.ht2	P, Q, Te	
KFM09B	275.00	295.00	3	1	20060217 12:39	20060217 13:58	__KFM09B_0275.00_200602171239.ht2	P, Q, Te	
KFM09B	295.00	315.00	3	1	20060217 14:20	20060217 15:37	__KFM09B_0295.00_200602171420.ht2	P, Q, Te	
KFM09B	315.00	335.00	3	1	20060217 16:02	20060217 17:17	__KFM09B_0315.00_200602171602.ht2	P, Q, Te	
KFM09B	335.00	355.00	3	1	20060221 10:56	20060221 12:27	__KFM09B_0335.00_200602211056.ht2	P, Q, Te	
KFM09B	355.00	375.00	3	1	20060221 12:45	20060221 14:02	__KFM09B_0355.00_200602211245.ht2	P, Q, Te	
KFM09B	375.00	395.00	3	1	20060221 14:24	20060221 15:47	__KFM09B_0375.00_200602211424.ht2	P, Q, Te	
KFM09B	395.00	415.00	3	1	20060221 16:09	20060221 17:26	__KFM09B_0395.00_200602211609.ht2	P, Q, Te	
KFM09B	415.00	435.00	3	1	20060222 08:52	20060222 09:35	__KFM09B_0415.00_200602220852.ht2	P, Q, Te	
KFM09B	435.00	455.00	3	1	20060222 10:03	20060222 10:48	__KFM09B_0435.00_200602221003.ht2	P, Q, Te	
KFM09B	455.00	475.00	3	1	20060222 11:06	20060222 13:12	__KFM09B_0455.00_200602221106.ht2	P, Q, Te	
KFM09B	475.00	495.00	3	1	20060222 13:30	20060222 14:50	__KFM09B_0475.00_200602221330.ht2	P, Q, Te	

Bh id	Test section		Test type	Test no	Test start Date, time	Test stop Date, time	Data files of raw and primary data	Parameters in file	Comments
idcode	(m)	(m)	(1-6)[1)]		YYYYMMDD hh:mm	YYYYMMDD hh:mm	__Borehole id_secup_date and time of test start		
KFM09B	495.00	515.00	3	1	20060222 15:14	20060222 15:57	__KFM09B_0495.00_200602221514.ht2	P, Q, Te	
KFM09B	505.00	525.00	3	1	20060222 16:12	20060222 16:59	__KFM09B_0505.50_200602221612.ht2	P, Q, Te	
KFM09B	515.00	535.00	3	1	20060223 08:37	20060223 09:55	__KFM09B_0515.00_200602230837.ht2	P, Q, Te	
KFM09B	525.50	545.50	3	1	20060223 10:10	20060223 11:25	__KFM09B_0525.50_200602231010.ht2	P, Q, Te	
KFM09B	535.00	555.00	3	1	20060223 11:42	20060223 13:03	__KFM09B_0535.00_200602231142.ht2	P, Q, Te	
KFM09B	545.50	565.50	3	1	20060223 13:24	20060223 14:12	__KFM09B_0545.50_200602231324.ht2	P, Q, Te	
KFM09B	565.50	585.50	3	1	20060223 14:29	20060223 15:47	__KFM09B_0565.50_200602231429.ht2	P, Q, Te	
KFM09B	585.50	605.50	3	1	20060223 16:09	20060223 16:50	__KFM09B_0585.50_200602231609.ht2	P, Q, Te	
KFM09B	10.50	15.50	3	1	20051123 13:55	20051123 15:41	__KFM09B_0010.50_200511231355.ht2	P, Q, Te	
KFM09B	15.50	20.50	3	1	20051125 14:49	20051125 16:18	__KFM09B_0015.50_200511251449.ht2	P, Q, Te	
KFM09B	18.00	23.00	3	1	20051125 12:55	20051125 14:22	__KFM09B_0018.00_200511251255.ht2	P, Q, Te	
KFM09B	21.30	26.30	3	1	20051125 10:24	20051125 11:49	__KFM09B_0021.30_200511251024.ht2	P, Q, Te	
KFM09B	24.00	29.00	3	1	20051123 18:10	20051123 19:39	__KFM09B_0024.00_200511231810.ht2	P, Q, Te	
KFM09B	29.00	34.00	3	1	20051123 20:38	20051123 22:16	__KFM09B_0029.00_200511232038.ht2	P, Q, Te	
KFM09B	34.00	39.00	3	1	20051123 22:58	20051124 00:17	__KFM09B_0034.00_200511232258.ht2	P, Q, Te	
KFM09B	39.00	44.00	3	1	20051124 09:12	20051124 10:30	__KFM09B_0039.00_200511240912.ht2	P, Q, Te	
KFM09B	44.00	49.00	3	1	20051124 11:04	20051124 12:53	__KFM09B_0044.00_200511241104.ht2	P, Q, Te	
KFM09B	49.00	54.00	3	1	20051124 13:25	20051124 14:41	__KFM09B_0049.00_200511241325.ht2	P, Q, Te	
KFM09B	52.75	57.75	3	1	20051124 15:53	20051124 17:11	__KFM09B_0052.75_200511241553.ht2	P, Q, Te	
KFM09B	55.00	60.00	3	1	20060227 09:46	20060227 10:28	__KFM09B_0055.00_200602270946.ht2	P, Q, Te	Re-performed[2)]
KFM09B	55.00	60.00	3	2	20060313 14:47	20060313 16:02	__KFM09B_0055.00_200603131447.ht2	P, Q, Te	
KFM09B	60.00	65.00	3	1	20060227 10:38	20060227 11:54	__KFM09B_0060.00_200602271038.ht2	P, Q, Te	
KFM09B	65.00	70.00	3	1	20060227 12:31	20060227 13:48	__KFM09B_0065.00_200602271231.ht2	P, Q, Te	
KFM09B	70.00	75.00	3	1	20060227 13:58	20060227 15:14	__KFM09B_0070.00_200602271358.ht2	P, Q, Te	
KFM09B	75.00	80.00	3	1	20060227 15:26	20060227 16:42	__KFM09B_0075.00_200602271526.ht2	P, Q, Te	
KFM09B	80.00	85.00	3	1	20060228 08:10	20060228 09:24	__KFM09B_0080.00_200602280810.ht2	P, Q, Te	
KFM09B	85.00	90.00	3	1	20060228 09:34	20060228 10:50	__KFM09B_0085.00_200602280934.ht2	P, Q, Te	
KFM09B	90.00	95.00	3	1	20060228 11:02	20060228 12:17	__KFM09B_0090.00_200602281102.ht2	P, Q, Te	
KFM09B	95.00	100.00	3	1	20060228 12:55	20060228 14:09	__KFM09B_0095.00_200602281255.ht2	P, Q, Te	
KFM09B	100.00	105.00	3	1	20060228 14:18	20060228 15:32	__KFM09B_0100.00_200602281418.ht2	P, Q, Te	
KFM09B	105.00	110.00	3	1	20060228 15:43	20060228 16:58	__KFM09B_0105.00_200602281543.ht2	P, Q, Te	
KFM09B	110.00	115.00	3	1	20060301 08:05	20060301 09:22	__KFM09B_0110.00_200603010805.ht2	P, Q, Te	
KFM09B	115.00	120.00	3	1	20060301 09:36	20060301 10:50	__KFM09B_0115.00_200603010936.ht2	P, Q, Te	
KFM09B	120.00	125.00	3	1	20060301 11:02	20060301 11:59	__KFM09B_0120.00_200603011102.ht2	P, Q, Te	
KFM09B	125.00	130.00	3	1	20060301 12:10	20060301 13:24	__KFM09B_0125.00_200603011210.ht2	P, Q, Te	
KFM09B	130.00	135.00	3	1	20060301 13:34	20060301 14:52	__KFM09B_0130.00_200603011334.ht2	P, Q, Te	
KFM09B	135.00	140.00	3	1	20060301 15:05	20060301 16:22	__KFM09B_0135.00_200603011505.ht2	P, Q, Te	

Bh id	Test section		Test type	Test no	Test start Date, time	Test stop Date, time	Data files of raw and primary data	Parameters in file	Comments
idcode	(m)	(m)	(1-6)[1)]		YYYYMMDD hh:mm	YYYYMMDD hh:mm	__Borehole id_secup_date and time of test start		
KFM09B	140.00	145.00	3	1	20060302 07:52	20060302 09:06	__KFM09B_0140.00_200603020752.ht2	P, Q, Te	
KFM09B	145.00	150.00	3	1	20060302 09:18	20060302 10:32	__KFM09B_0145.00_200603020918.ht2	P, Q, Te	
KFM09B	150.00	155.00	3	1	20060302 10:59	20060302 11:45	__KFM09B_0150.00_200603021059.ht2	P, Q, Te	
KFM09B	155.00	160.00	3	1	20060302 11:54	20060302 13:08	__KFM09B_0155.00_200603021154.ht2	P, Q, Te	
KFM09B	160.00	165.00	3	1	20060302 13:18	20060302 13:55	__KFM09B_0160.00_200603021318.ht2	P, Q, Te	Interrupted[2)]
KFM09B	160.00	165.00	3	2	20060313 12:45	20060313 14:04	__KFM09B_0160.00_200603131245.ht2	P, Q, Te	
KFM09B	165.00	170.00	3	1	20060302 14:08	20060302 15:25	__KFM09B_0165.00_200603021408.ht2	P, Q, Te	
KFM09B	170.00	175.00	3	1	20060303 07:47	20060303 08:31	__KFM09B_0170.00_200603030747.ht2	P, Q, Te	
KFM09B	175.00	180.00	3	1	20060303 08:56	20060303 09:44	__KFM09B_0175.00_200603030856.ht2	P, Q, Te	
KFM09B	180.00	185.00	3	1	20060303 09:57	20060303 11:13	__KFM09B_0180.00_200603030957.ht2	P, Q, Te	
KFM09B	185.00	190.00	3	1	20060303 11:28	20060303 13:26	__KFM09B_0185.00_200603031128.ht2	P, Q, Te	
KFM09B	190.00	195.00	3	1	20060303 13:39	20060303 14:55	__KFM09B_0190.00_200603031339.ht2	P, Q, Te	
KFM09B	215.00	220.00	3	1	20060303 15:23	20060303 16:39	__KFM09B_0215.00_200603031523.ht2	P, Q, Te	Re-performed[2)]
KFM09B	215.00	220.00	3	2	20060313 10:12	20060313 11:35	__KFM09B_0215.00_200603131012.ht2	P, Q, Te	
KFM09B	220.00	225.00	3	1	20060306 08:24	20060306 09:42	__KFM09B_0220.00_200603060824.ht2	P, Q, Te	
KFM09B	225.00	230.00	3	1	20060306 09:53	20060306 10:40	__KFM09B_0225.00_200603060953.ht2	P, Q, Te	
KFM09B	230.00	235.00	3	1	20060306 10:49	20060306 12:52	__KFM09B_0230.00_200603061049.ht2	P, Q, Te	
KFM09B	235.00	240.00	3	1	20060306 13:01	20060306 14:21	__KFM09B_0235.00_200603061301.ht2	P, Q, Te	
KFM09B	240.00	245.00	3	1	20060306 14:32	20060306 15:50	__KFM09B_0240.00_200603061432.ht2	P, Q, Te	
KFM09B	245.00	250.00	3	1	20060306 16:06	20060306 17:02	__KFM09B_0245.00_200603061606.ht2	P, Q, Te	
KFM09B	250.00	255.00	3	1	20060307 08:40	20060307 09:59	__KFM09B_0250.00_200603070840.ht2	P, Q, Te	
KFM09B	275.00	280.00	3	1	20060307 10:33	20060307 11:51	__KFM09B_0275.00_200603071033.ht2	P, Q, Te	
KFM09B	280.00	285.00	3	1	20060307 12:50	20060307 14:05	__KFM09B_0280.00_200603071250.ht2	P, Q, Te	
KFM09B	285.00	290.00	3	1	20060307 14:20	20060307 15:20	__KFM09B_0285.00_200603071420.ht2	P, Q, Te	
KFM09B	290.00	295.00	3	1	20060307 15:32	20060307 16:17	__KFM09B_0290.00_200603071532.ht2	P, Q, Te	
KFM09B	372.00	377.00	3	1	20060308 08:14	20060308 08:57	__KFM09B_0373.00_200603080814.ht2	P, Q, Te	
KFM09B	378.00	383.00	3	1	20060308 09:11	20060308 10:28	__KFM09B_0378.00_200603080911.ht2	P, Q, Te	
KFM09B	383.00	388.00	3	1	20060308 10:42	20060308 11:58	__KFM09B_0383.00_200603081042.ht2	P, Q, Te	
KFM09B	388.00	393.00	3	1	20060308 12:43	20060308 13:24	__KFM09B_0388.00_200603081243.ht2	P, Q, Te	
KFM09B	393.00	398.00	3	1	20060308 13:46	20060308 14:28	__KFM09B_0393.00_200603081346.ht2	P, Q, Te	
KFM09B	475.00	480.00	3	1	20060308 15:17	20060308 16:33	__KFM09B_0475.00_200603081517.ht2	P, Q, Te	
KFM09B	480.00	485.00	3	1	20060309 08:34	20060309 09:25	__KFM09B_0480.00_200603090834.ht2	P, Q, Te	
KFM09B	485.00	490.00	3	1	20060309 09:42	20060309 10:30	__KFM09B_0485.00_200603090942.ht2	P, Q, Te	
KFM09B	490.00	495.00	3	1	20060309 10:43	20060309 11:35	__KFM09B_0490.00_200603091043.ht2	P, Q, Te	
KFM09B	515.00	520.00	3	1	20060309 12:05	20060309 13:34	__KFM09B_0515.00_200603091205.ht2	P, Q, Te	
KFM09B	520.00	525.00	3	1	20060309 13:48	20060309 14:42	__KFM09B_0520.00_200603091348.ht2	P, Q, Te	
KFM09B	525.00	530.00	3	1	20060309 14:56	20060309 16:17	__KFM09B_0525.00_200603091456.ht2	P, Q, Te	
KFM09B	530.00	535.00	3	1	20060309 16:41	20060309 17:59	__KFM09B_0530.00_200603091641.ht2	P, Q, Te	

Bh id	Test section		Test type	Test no	Test start Date, time	Test stop Date, time	Data files of raw and primary data	Parameters in file	Comments
idcode	(m)	(m)	(1-6)[1]		YYYYMMDD hh:mm	YYYYMMDD hh:mm	__Borehole id_secup_date and time of test start		
KFM09B	564.50	569.50	3	1	20060310 08:50	20060310 09:33	__KFM09B_0564.50_200603100850.ht2	P, Q, Te	Interrupted[2]
KFM09B	564.50	569.50	3	2	20060310 14:19	20060310 15:35	__KFM09B_0564.50_200603101419.ht2	P, Q, Te	
KFM09B	569.50	574.50	3	1	20060310 09:45	20060310 11:11	__KFM09B_0569.50_200603100945.ht2	P, Q, Te	
KFM09B	574.50	579.50	3	1	20060310 11:24	20060310 12:07	__KFM09B_0574.50_200603101124.ht2	P, Q, Te	
KFM09B	579.50	584.50	3	1	20060310 12:17	20060310 12:59	__KFM09B_0579.50_200603101217.ht2	P, Q, Te	
KFM09B	584.50	589.50	3	1	20060310 13:17	20060310 14:00	__KFM09B_0584.50_200603101317.ht2	P, Q, Te	

1) Injection test

2) The tests were interrupted for various reasons or did not provide satisfying data for the evaluation and were hence re-performed later

Appendix 2.1. General test data

Borehole:	KFM09B
Testtype:	CHir (Constant Head injection and recovery)
Field crew:	C. Hjerne, K. Gokall-Norman, T. Svensson, A. Lindquist, J. Harrström, E. Gustavsson
General comment:	

Test section secup	Test section seclow	Test start	Start of flow period	Stop of flow period	Test stop	Total flow time t_p	Total recovery time t_F
(m)	(m)	YYYYMMDD hh:mm	YYYYMMDD hh:mm:ss	YYYYMMDD hh:mm:ss	YYYYMMDD hh:mm	(min)	(min)
55.00	155.00	20060209 14:28	20060209 15:25:24	20060209 15:55:38	20060209 16:28	30	30
155.00	255.00	20060210 07:19	20060210 08:05:14	20060210 08:35:28	20060210 09:07	30	30
255.00	355.00	20060210 11:13	20060210 11:59:00	20060210 12:29:16	20060210 13:01	30	30
355.00	455.00	20060210 13:47	20060210 14:33:21	20060210 15:03:37	20060210 15:35	30	30
455.00	555.00	20060213 09:33	20060213 10:20:54	20060213 10:51:13	20060213 11:23	30	30
507.00	607.00	20060213 14:06	20060213 14:55:42	20060213 15:26:13	20060213 15:58	31	30
55.00	75.00	20060215 13:24	20060215 14:24:57	20060215 14:45:11	20060215 15:07	20	20
75.00	95.00	20060215 15:33	20060215 16:09:45	20060215 16:29:57	20060215 16:52	20	20
95.00	115.00	20060215 17:22	20060215 17:57:23	20060215 18:17:39	20060215 18:39	20	20
115.00	135.00	20060216 07:23	20060216 07:59:07	20060216 08:19:19	20060216 08:41	20	20
135.00	155.00	20060216 09:03	20060216 09:38:12	20060216 09:58:26	20060216 10:20	20	20
155.00	175.00	20060216 10:38	20060216 11:15:45	20060216 11:35:59	20060216 11:58	20	20
175.00	195.00	20060216 12:48	20060216 13:24:44	20060216 13:44:58	20060216 14:07	20	20
195.00	215.00	20060216 14:33	20060216 15:09:19	20060216 15:19:15	20060216 15:28	10	7
215.00	235.00	20060216 16:02	20060216 16:42:22	20060216 17:02:35	20060216 17:24	20	20
235.00	255.00	20060217 08:34	20060217 09:11:53	20060217 09:32:06	20060117 09:54	20	20
255.00	275.00	20060217 10:18	20060217 10:56:40	20060217 11:16:54	20060217 11:39	20	20
275.00	295.00	20060217 12:39	20060217 13:15:29	20060217 13:35:43	20060217 13:58	20	20
295.00	315.00	20060217 14:20	20060217 14:55:10	20060217 15:15:24	20060217 15:37	20	20
315.00	335.00	20060217 16:02	20060217 16:34:39	20060217 16:54:45	20060217 17:17	20	20
335.00	355.00	20060221 10:56	20060221 12:11:27	20060221 12:20:22	20060221 12:27	9	5
355.00	375.00	20060221 12:45	20060221 13:20:02	20060221 13:40:21	20060221 14:02	20	20
375.00	395.00	20060221 14:24	20060221 15:05:07	20060221 15:25:21	20060221 15:47	20	20
395.00	415.00	20060221 16:09	20060221 16:43:53	20060221 17:04:07	20060221 17:26	20	20
415.00	435.00	20060222 08:52	20060222 09:24:39	20060222 09:27:52	20060222 09:35	3	5
435.00	455.00	20060222 10:03	20060222 10:38:48	20060222 10:41:04	20060222 10:48	2	5
455.00	475.00	20060222 11:06	20060222 12:30:21	20060222 12:50:27	20060222 13:12	20	20
475.00	495.00	20060222 13:30	20060222 14:07:40	20060222 14:27:55	20060222 14:50	20	20
495.00	515.00	20060222 15:14	20060222 15:47:39	20060222 15:50:25	20060222 15:57	3	5
505.00	525.00	20060222 16:12	20060222 16:48:33	20060222 16:52:14	20060222 16:59	4	5
515.00	535.00	20060223 08:37	20060223 09:12:29	20060223 09:32:43	20060223 09:55	20	20
525.50	545.50	20060223 10:10	20060223 10:43:12	20060223 11:03:26	20060223 11:25	20	20
535.00	555.00	20060223 11:42	20060223 12:53:55	20060223 12:55:53	20060223 13:03	2	5
545.50	565.50	20060223 13:24	20060223 13:57:53	20060223 14:04:45	20060223 14:12	7	5
565.50	585.50	20060223 14:29	20060223 15:04:42	20060223 15:24:56	20060223 15:47	20	20
585.50	605.50	20060223 16:09	20060223 16:41:14	20060223 16:42:50	20060223 16:50	2	5
10.50	15.50	20051123 13:55	20051123 14:58:49	20051123 15:19:08	20051123 15:41	20	20
15.50	20.50	20051125 14:49	20051125 15:35:32	20051125 15:55:48	20051125 16:18	20	20
18.00	23.00	20051125 12:55	20051125 13:40:05	20051125 14:00:21	20051125 14:22	20	20
21.30	26.30	20051125 10:24	20051125 11:06:27	20051125 11:26:47	20051125 11:49	20	20
24.00	29.00	20051123 18:10	20051123 18:57:09	20051123 19:17:31	20051123 19:39	20	20
29.00	34.00	20051123 20:38	20051123 21:34:03	20051123 21:54:27	20051123 22:16	20	20
34.00	39.00	20051123 22:58	20051123 23:35:11	20051123 23:55:34	20051124 00:17	20	20
39.00	44.00	20051124 09:12	20051124 09:47:46	20051124 10:08:06	20051124 10:30	20	20
44.00	49.00	20051124 11:04	20051124 12:10:40	20051124 12:31:00	20051124 12:53	20	20
49.00	54.00	20051124 13:25	20051124 13:58:43	20051124 14:19:00	20051124 14:41	20	20
52.75	57.75	20051124 15:53	20051124 16:28:38	20051124 16:48:57	20051124 17:11	20	20
55.00	60.00	20060313 14:47	20060313 15:19:59	20060313 15:40:19	20060313 16:02	20	20
60.00	65.00	20060227 10:38	20060227 11:11:52	20060227 11:32:06	20060227 11:54	20	20
65.00	70.00	20060227 12:31	20060227 13:06:26	20060227 13:26:40	20060227 13:48	20	20
70.00	75.00	20060227 13:58	20060227 14:31:31	20060227 14:51:44	20060227 15:14	20	20
75.00	80.00	20060227 15:26	20060227 16:00:10	20060227 16:20:24	20060227 16:42	20	20
80.00	85.00	20060228 08:10	20060228 08:41:38	20060228 09:01:53	20060228 09:24	20	20
85.00	90.00	20060228 09:34	20060228 10:07:29	20060228 10:27:45	20060228 10:50	20	20
90.00	95.00	20060228 11:02	20060228 11:34:40	20060228 11:54:53	20060228 12:17	20	20
95.00	100.00	20060228 12:55	20060228 13:26:44	20060228 13:47:00	20060228 14:09	20	20
100.00	105.00	20060228 14:18	20060228 14:49:49	20060228 15:10:03	20060228 15:32	20	20
105.00	110.00	20060228 15:43	20060228 16:15:33	20060228 16:35:47	20060228 16:58	20	20

Test section secup	Test section seclow	Test start	Start of flow period	Stop of flow period	Test stop	Total flow time t_p	Total recovery time t_F
(m)	(m)	YYYYMMDD hh:mm	YYYYMMDD hh:mm:ss	YYYYMMDD hh:mm:ss	YYYYMMDD hh:mm	(min)	(min)
110.00	115.00	20060301 08:05	20060301 08:39:57	20060301 09:00:08	20060301 09:22	20	20
115.00	120.00	20060301 09:36	20060301 10:08:08	20060301 10:28:21	20060301 10:50	20	20
120.00	125.00	20060301 11:02	20060301 11:43:56	20060301 11:52:21	20060301 11:59	8	5
125.00	130.00	20060301 12:10	20060301 12:42:15	20060301 13:02:28	20060301 13:24	20	20
130.00	135.00	20060301 13:34	20060301 14:09:32	20060301 14:29:46	20060301 14:52	20	20
135.00	140.00	20060301 15:05	20060301 15:39:25	20060301 15:59:44	20060301 16:22	20	20
140.00	145.00	20060302 07:52	20060302 08:23:34	20060302 08:43:51	20060302 09:06	20	20
145.00	150.00	20060302 09:18	20060302 09:50:24	20060302 10:10:39	20060302 10:32	20	20
150.00	155.00	20060302 10:59	20060302 11:31:46	20060302 11:37:39	20060302 11:45	6	5
155.00	160.00	20060302 11:54	20060302 12:26:10	20060302 12:46:25	20060302 13:08	20	20
160.00	165.00	20060313 12:45	20060313 13:21:59	20060313 13:42:17	20060313 14:04	20	20
165.00	170.00	20060302 14:08	20060302 14:42:44	20060302 15:02:59	20060302 15:25	20	20
170.00	175.00	20060303 07:47	20060303 08:22:25	20060303 08:23:42	20060303 08:31	1	5
175.00	180.00	20060303 08:56	20060303 09:33:47	20060303 09:36:40	20060303 09:44	3	5
180.00	185.00	20060303 09:57	20060303 10:31:10	20060303 10:51:25	20060303 11:13	20	20
185.00	190.00	20060303 11:28	20060303 12:44:18	20060303 13:04:34	20060303 13:26	20	20
190.00	195.00	20060303 13:39	20060303 14:12:42	20060303 14:32:59	20060303 14:55	20	20
215.00	220.00	20060313 10:12	20060313 10:52:54	20060313 11:13:22	20060313 11:35	20	20
220.00	225.00	20060306 08:24	20060306 09:00:07	20060306 09:20:24	20060306 09:42	20	20
225.00	230.00	20060306 09:53	20060306 10:25:46	20060306 10:32:42	20060306 10:40	7	5
230.00	235.00	20060306 10:49	20060306 12:09:12	20060306 12:30:21	20060306 12:52	21	20
235.00	240.00	20060306 13:01	20060306 13:38:26	20060306 13:58:43	20060306 14:21	20	20
240.00	245.00	20060306 14:32	20060306 15:08:12	20060306 15:28:28	20060306 15:50	20	20
245.00	250.00	20060306 16:06	20060306 16:37:31	20060306 16:55:28	20060306 17:02	18	5
250.00	255.00	20060307 08:40	20060307 09:16:55	20060307 09:37:11	20060307 09:59	20	20
275.00	280.00	20060307 10:33	20060307 11:09:24	20060307 11:29:42	20060307 11:51	20	20
280.00	285.00	20060307 12:50	20060307 13:23:18	20060307 13:43:36	20060307 14:05	20	20
285.00	290.00	20060307 14:20	20060307 14:53:26	20060307 15:12:41	20060307 15:20	19	5
290.00	295.00	20060307 15:32	20060307 16:07:55	20060307 16:10:20	20060307 16:17	2	5
372.00	377.00	20060308 08:14	20060308 08:46:53	20060308 08:49:40	20060308 08:57	3	5
378.00	383.00	20060308 09:11	20060308 09:45:42	20060308 10:05:58	20060308 10:28	20	20
383.00	388.00	20060308 10:42	20060308 11:16:13	20060308 11:36:30	20060308 11:58	20	20
388.00	393.00	20060308 12:43	20060308 13:15:53	20060308 13:17:27	20060308 13:24	2	5
393.00	398.00	20060308 13:46	20060308 14:18:52	20060308 14:21:13	20060308 14:28	2	5
475.00	480.00	20060308 15:17	20060308 15:50:36	20060308 16:10:54	20060308 16:33	20	20
480.00	485.00	20060309 08:34	20060309 09:12:29	20060309 09:14:49	20060309 09:25	2	8
485.00	490.00	20060309 09:42	20060309 10:17:10	20060309 10:21:33	20060309 10:30	4	7
490.00	495.00	20060309 10:43	20060309 11:20:49	20060309 11:24:57	20060309 11:35	4	8
515.00	520.00	20060309 12:05	20060309 13:17:39	20060309 13:22:27	20060309 13:34	5	7
520.00	525.00	20060309 13:48	20060309 14:24:36	20060309 14:34:30	20060309 14:42	10	6
525.00	530.00	20060309 14:56	20060309 15:35:08	20060309 15:55:26	20060309 16:17	20	20
530.00	535.00	20060309 16:41	20060309 17:16:53	20060309 17:37:11	20060309 17:59	20	20
564.50	569.50	20060310 14:19	20060310 14:52:33	20060310 15:12:51	20060310 15:35	20	20
569.50	574.50	20060310 09:45	20060310 10:28:34	20060310 10:48:49	20060310 11:11	20	20
574.50	579.50	20060310 11:24	20060310 11:57:11	20060310 12:00:08	20060310 12:07	3	5
579.50	584.50	20060310 12:17	20060310 12:50:03	20060310 12:52:09	20060310 12:59	2	5
584.50	589.50	20060310 13:17	20060310 13:50:46	20060310 13:53:11	20060310 14:00	2	5
55.00[1)]	60.00	20060227 09:46	20060227 10:25:36	20060227 10:26:19	20060227 10:28	1	0
160.00[1)]	165.00	20060302 13:18	20060302 13:50:49	20060302 13:52:46	20060302 13:55	2	1
215.00[1)]	220.00	20060303 15:23	20060303 15:56:28	20060303 16:17:09	20060303 16:39	21	20
255.00[1)]	355.00	20060210 10:06	20060210 10:53:13	20060210 10:56:33	20060210 10:57	3	0
255.00[1)]	355.00	20060210 10:59	20060210 11:11:12	20060210 11:11:30	20060210 11:11	0	0
507.00[1)]	607.00	20060213 12:25	20060213 13:32:53	20060213 13:34:35	20060213 13:37	2	0
564.50[1)]	569.50	20060310 08:50	20060310 09:26:56	20060310 09:30:05	20060310 09:33	3	1

[1)] The tests were interrupted for various reasons or did not provide satisfying data for the evaluation and were hence re-performed later

Appendix 2.2 Pressure and flow data

Summary of pressure and flow data for all tests in KFM09B

Test section		Pressure			Flow		
secup	seclow	p_i	p_p	p_F	Q_p [1)]	Q_m [2)]	V_p [2)]
(m)	(m)	(kPa)	(kPa)	(kPa)	(m^3/s)	(m^3/s)	(m^3)
55.00	155.00	495.85	538.23	509.61	5.46E-05	9.28E-05	1.69E-01
155.00	255.00	1282.4	1398	1334.20	3.18E-05	6.84E-05	1.24E-01
255.00	355.00	2068.53	2285.94	2138.43	6.17E-08	1.1E-07	2.00E-04
355.00	455.00	2819.48	3014.22	2843.01	6.12E-07	7.69E-07	1.40E-03
455.00	555.00	3545	3760.37	3681.92	4.33E-08	1.35E-07	2.45E-04
507.00	607.00	3896.74	4115.1	4084.31	3.85E-07	2.05E-06	3.79E-03
55.00	75.00	505.7	761.53	610.70	0.000146	0.000178	2.16E-01
75.00	95.00	670.7	881.53	745.57	0.000161	0.000214	2.59E-01
95.00	115.00	821.53	1060.98	861.71	2.06E-05	3.14E-05	3.81E-02
115.00	135.00	982.95	1150.02	1086.85	4.04E-05	0.000102	1.25E-01
135.00	155.00	1147.95	1368.41	1255.30	1.85E-06	3.92E-06	4.76E-03
155.00	175.00	1296.04	1501.9	1317.50	2.4E-05	3.47E-05	4.22E-02
175.00	195.00	1465.01	1626.86	1541.53	9.18E-08	1.85E-07	2.25E-04
195.00	215.00	1629.75	1855.85	1835.48			
215.00	235.00	1777.82	2002.27	1935.67	1.61E-07	5.67E-07	6.90E-04
235.00	255.00	1930.71	2101.35	2050.71	2.75E-05	9.29E-05	1.13E-01
255.00	275.00	2117.59	2330.34	2260.44			
275.00	295.00	2248.33	2486.33	2279.71	5.13E-08	7.05E-08	8.57E-05
295.00	315.00	2406.31	2640.26	2546.68	1.39E-08	3.51E-08	4.23E-05
315.00	335.00	2565.94	2794.94	2717.88			
335.00	355.00	2733.84	2956.91	2951.27			
355.00	375.00	2877.1	3111.7	3029.44	7.5E-09	2.84E-08	3.42E-05
375.00	395.00	3015.36	3213.42	3041.00	7.7E-07	8.96E-07	1.09E-03
395.00	415.00	3171.73	3403.2	3315.13	2.1E-08	6.63E-08	8.07E-05
415.00	435.00	3337.56	3557.89	3571.65			
435.00	455.00	3514.94	3703.2	3729.62			
455.00	475.00	3612.38	3852.93	3779.71			
475.00	495.00	3773.11	3993.3	3906.32	2.8E-08	8.16E-08	9.93E-05
495.00	515.00	3940.46	4139.58	4170.55			
505.00	525.00	4002.1	4215.96	4222.84			
515.00	535.00	4042.15	4279.81	4212.93	2.56E-08	7.54E-08	9.15E-05
525.50	545.50	4121.83	4351.1	4288.34	2.25E-08	7.68E-08	9.34E-05
535.00	555.00	4202.48	4417.43	4439.18			
545.50	565.50	4266.05	4492.02	4483.21			
565.50	585.50	4389.07	4607.6	4576.79	5E-07	2.72E-06	3.39E-03
585.50	605.50	4589.58	4766.97	4822.84			
10.50	15.50	190.95	387.46	195.91	3.01E-05	3.15E-05	3.85E-02
15.50	20.50	214.46	384.12	219.29	0.000347	0.000349	4.24E-01
18.00	23.00	232.53	433.25	236.95	0.000279	0.000303	3.68E-01
21.30	26.30	257.37	528.53	288.83	2.33E-06	3.29E-06	4.02E-03
24.00	29.00	283.59	491.43	327.48	3.29E-06	4.75E-06	5.83E-03
29.00	34.00	322.79	703.95	342.94	1.13E-06	1.43E-06	1.75E-03
34.00	39.00	363.35	575.86	365.56	7.51E-07	9.35E-07	1.15E-03
39.00	44.00	399.24	599.6	400.88	7.24E-07	9.02E-07	1.10E-03
44.00	49.00	437.17	637.68	440.08	3.23E-05	3.36E-05	4.11E-02
49.00	54.00	477.61	507.9	484.78	0.000172	0.000267	3.25E-01
52.75	57.75	512.52	594.62	518.45	0.000179	0.000213	2.59E-01
55.00	60.00	507.86	721.85	539.91	2.95E-08	3.82E-08	4.67E-05
60.00	65.00	541.19	743.76	644.68	9.29E-05	0.000122	1.48E-01
65.00	70.00	583.03	730.39	587.43	1.7E-05	1.77E-05	2.16E-02
70.00	75.00	622.12	812.01	644.68	1.6E-06	2.2E-06	2.67E-03
75.00	80.00	661.19	805.97	715.69	9.73E-05	0.00015	1.83E-01
80.00	85.00	706.44	871.95	818.45	7.45E-07	2.44E-06	3.00E-03
85.00	90.00	749.64	944.58	802.49	1.26E-07	1.92E-07	2.34E-04
90.00	95.00	787.62	991.8	948.92	9E-08	4.33E-07	5.29E-04
95.00	100.00	826.29	1033.69	948.92	1.34E-06	3.12E-06	3.80E-03
100.00	105.00	858.92	1067.51	861.95	9.83E-06	1.1E-05	1.33E-02
105.00	110.00	903.36	1103.18	969.28	2.63E-06	3.76E-06	4.57E-03
110.00	115.00	940.25	1066.11	974.24	3.37E-06	6E-06	7.31E-03
115.00	120.00	981.94	1161.39	1112.40	5.82E-06	2.09E-05	2.55E-02
120.00	125.00	1034.23	1285.24	1246.71			
125.00	130.00	1062.31	1242.06	1111.85	2.3E-05	3.27E-05	3.98E-02
130.00	135.00	1105.52	1290.2	1172.95	4.47E-05	7.6E-05	9.24E-02

Test section		Pressure			Flow		
secup	**seclow**	p_i	p_p	p_F	Q_p[1]	Q_m[2]	V_p[2]
(m)	(m)	(kPa)	(kPa)	(kPa)	(m^3/s)	(m^3/s)	(m^3)
135.00	140.00	1156.99	1390.99	1340.29	2.31E-08	9.44E-08	1.15E-04
140.00	145.00	1204.33	1420.25	1275.34	6.21E-09	1.14E-08	1.38E-05
145.00	150.00	1224.69	1429.5	1324.88	1.51E-06	3.49E-06	4.24E-03
150.00	155.00	1271.35	1505.43	1456.99			
155.00	160.00	1297.36	1505.43	1305.06	4.7E-06	6.17E-06	7.51E-03
160.00	165.00	1347.04	1508.05	1346.90	4.58E-06	4.62E-06	5.63E-03
165.00	170.00	1376.35	1565.98	1415.72	1.48E-05	2.37E-05	2.88E-02
170.00	175.00	1450.38	1655.84	1663.96			
175.00	180.00	1471.72	1695.34	1658.46			
180.00	185.00	1504.47	1740.15	1622.68	6.54E-08	1.28E-07	1.56E-04
185.00	190.00	1543.82	1780.8	1703.60	4.36E-08	1.17E-07	1.43E-04
190.00	195.00	1588.56	1803.79	1619.93	4E-08	5.94E-08	7.24E-05
215.00	220.00	1771.31	1968.4	1944.15	3.66E-08	2.86E-07	3.49E-04
220.00	225.00	1823.06	2031.82	1884.70	6.05E-08	1E-07	1.22E-04
225.00	230.00	1877.41	2073.51	2021.22			
230.00	235.00	1900.66	2116.17	2009.66	4.58E-08	9.4E-08	1.20E-04
235.00	240.00	1939.2	2147.79	2045.44	7.31E-08	1.65E-07	2.02E-04
240.00	245.00	1977.18	2148.37	2035.53	8.11E-06	1.16E-05	1.41E-02
245.00	250.00	2039.11	2225.29	2210.57			
250.00	255.00	2052.05	2181.35	2149.47	1.52E-05	6.05E-05	7.38E-02
275.00	280.00	2254.88	2465.99	2281.04	5.47E-08	7.18E-08	8.76E-05
280.00	285.00	2291.49	2508.93	2366.35	8.67E-09	1.24E-08	1.50E-05
285.00	290.00	2341.04	2546.37	2460.49			
290.00	295.00	2383.56	2580.9	2583.24			
373.00	378.00	3029.66	3222.88	3221.78			
378.00	383.00	3042.33	3258.66	3054.99	4.47E-07	5.05E-07	6.15E-04
383.00	388.00	3082.64	3309.85	3093.52	5.72E-07	6.4E-07	7.79E-04
388.00	393.00	3189.3	3337.93	3374.25			
393.00	398.00	3214.48	3373.56	3400.13			
475.00	480.00	3777.74	3987.88	3901.59	2.56E-08	7.14E-08	8.71E-05
480.00	485.00	3905.86	4034.81	4103.61			
485.00	490.00	3981.14	4071.41	4191.68			
490.00	495.00	4052.29	4107.47	4303.99			
515.00	520.00	4169.67	4282.52	4351.33			
520.00	525.00	4213.84	4317.2	4371.69			
525.00	530.00	4127.84	4375.1	4300.13	1.85E-08	6.76E-08	8.15E-05
530.00	535.00	4191.28	4408.57	4296.28	7.51E-09	1.94E-08	2.34E-05
564.50	569.50	4397.7	4597.93	4558.86	6.05E-07	2.3E-06	2.81E-03
569.50	574.50	4435.55	4570.9	4519.77	7.23E-07	2.09E-06	2.58E-03
574.50	579.50	4532.98	4672.24	4677.20			
579.50	584.50	4561.6	4707.48	4731.14			
584.50	589.50	4634.68	4743.11	4765.27			
55.00	155.00	495.85	538.23	509.61	5.46E-05	9.28E-05	1.69E-01
155.00	255.00	1282.4	1398	1334.20	3.18E-05	6.84E-05	1.24E-01
255.00	355.00	2068.53	2285.94	2138.43	6.17E-08	1.1E-07	2.00E-04
355.00	455.00	2819.48	3014.22	2843.01	6.12E-07	7.69E-07	1.40E-03
455.00	555.00	3545	3760.37	3681.92	4.33E-08	1.35E-07	2.45E-04
507.00	607.00	3896.74	4115.1	4084.31	3.85E-07	2.05E-06	3.79E-03
55.00[3]	60.00	500.6	810.91	790.55			
160.00[3]	165.00	1336.58	1405.38	1336.99	4.3E-07	3.65E-06	4.28E-04
215.00[3]	220.00	1782.86	1995.9	1968.92	4.15E-08	3.33E-07	4.13E-04
255.00[3]	355.00	2071.82	2284.99	2279.34	1.14E-07	4.26E-07	8.53E-05
255.00[3]	355.00	2096.59	2117.65	2117.51			
507.00[3]	607.00	3945.46	4010	4008.35			
564.50[3]	569.50	4402.1	4717.1	4519.23	8.52E-06	6.91E-06	1.31E-03

[1] No value indicates a flow below measurement limit (measurement limit is unique for each test but nominally 1.67 E-8 m^3/s).
[2] No value indicates that the parameter could not be calculated due to low and uncertain flow rates during a major part of flow period
[3] The tests were interrupted for various reasons or did not provide satisfying data for the evaluation and were hence re-performed later.

p_i	Pressure in test section before start of flow period
p_p	Pressure in test section before stop of flow period
p_F	Pressure in test section at the end of recovery period
Q_p	Flow rate just before stop of flow period
Q_m	Mean (arithmetic) flow rate during flow period
V_p	Total volume injected during the flow period

Appendix 3. Test diagrams – Injection Tests

In the following pages the selected test diagrams are presented for all test sections. A linear diagram of pressure and flow rate is presented for each test. For most tests are lin-log and log-log diagrams presented, from injection and recovery period respectively. From tests with a flow rate below the estimated lower measurement limit for the specific test, only the linear diagram is presented. Additionally, for a few tests, a type curve fit is displayed in the diagrams despite the the fact that the estimated parameters from the fit are judged as non-representative. For these tests, the type curve fit is presented, as an example, to illustrate that an assumption of a certain flow regime is not justified for the test. Instead, some other flow regime is likely to dominate.

Nomenclature for Aqtesolv:

T	=	transmissivity (m^2/s)
S	=	storativity (-)
K_z/K_r	=	ratio of hydraulic conductivities in the vertical and radial direction (set to 1)
Sw	=	skin factor
r(w)	=	borehole radius (m)
r(c)	=	effective casing radius (m)
C	=	well loss constant (set to 0)
r/B	=	leakage factor (-)

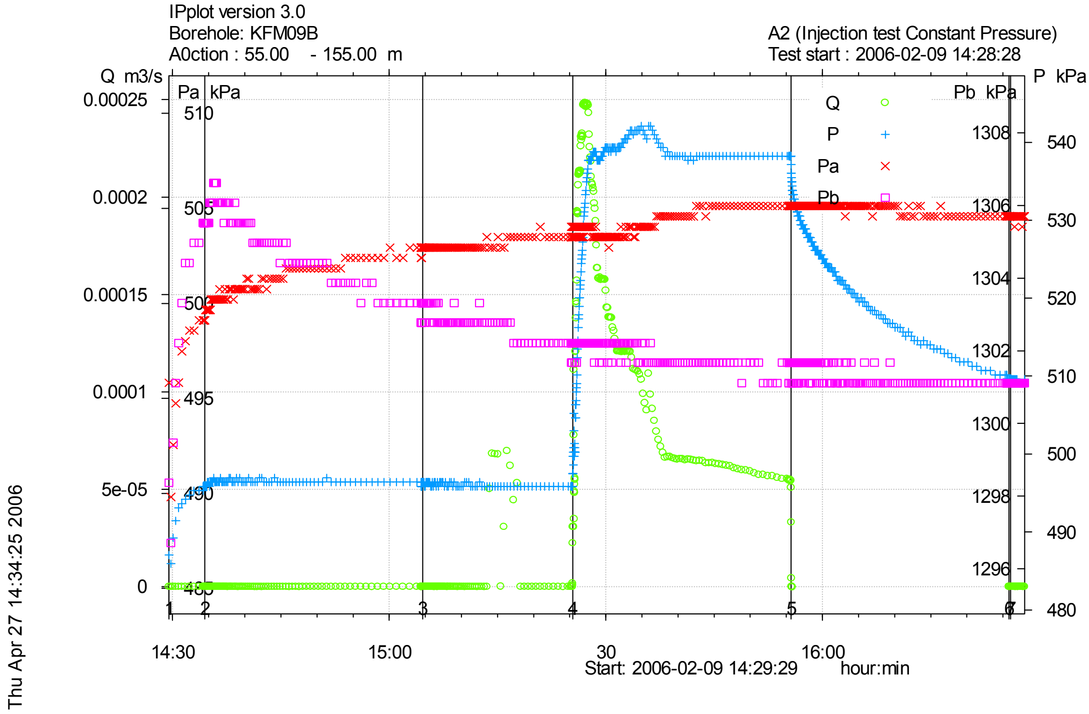


Figure A3-1. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 55.0-155.0 m in borehole KFM09B.*

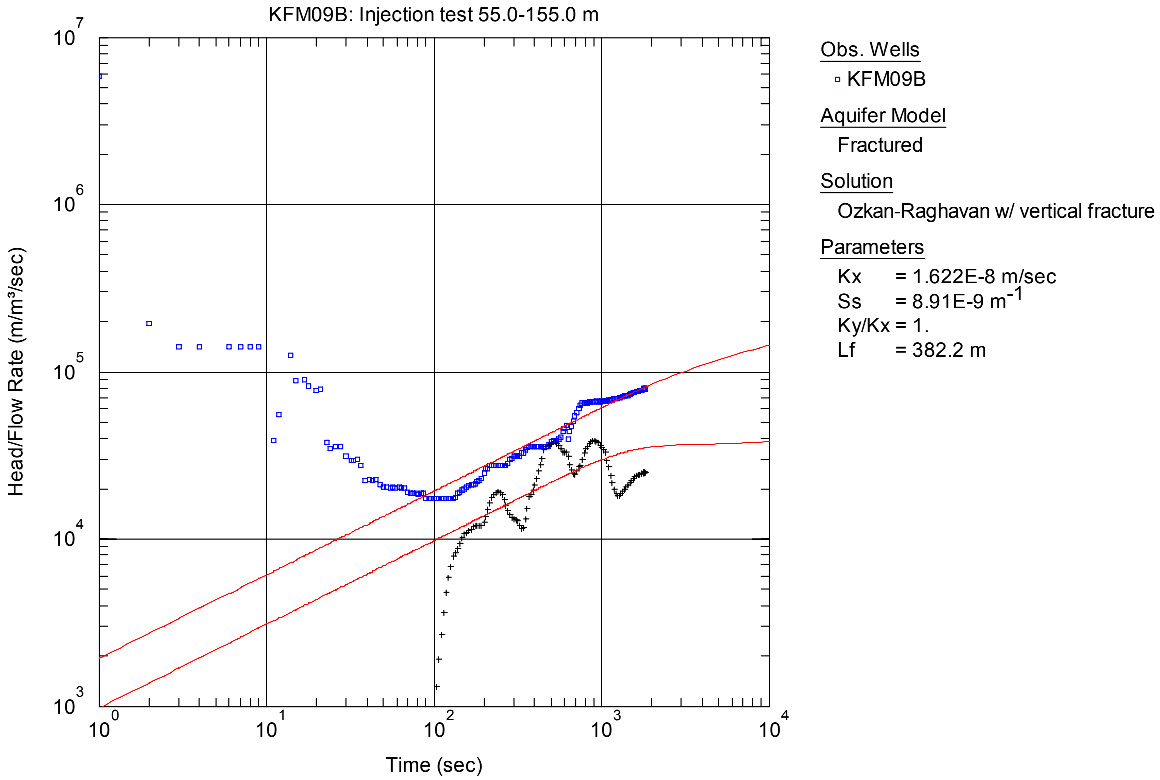


Figure A3-2. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 55.0-155.0 m in KFM09B.*

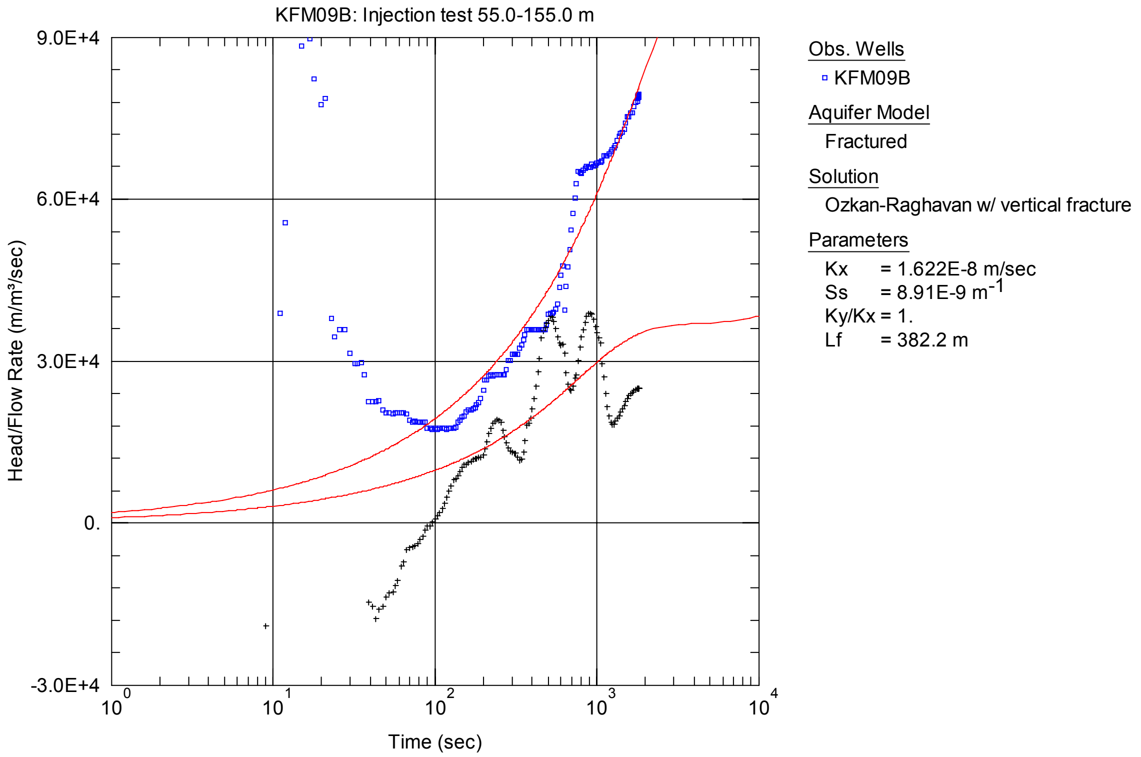


Figure A3-3. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 55.0-155.0 m in KFM09B.*

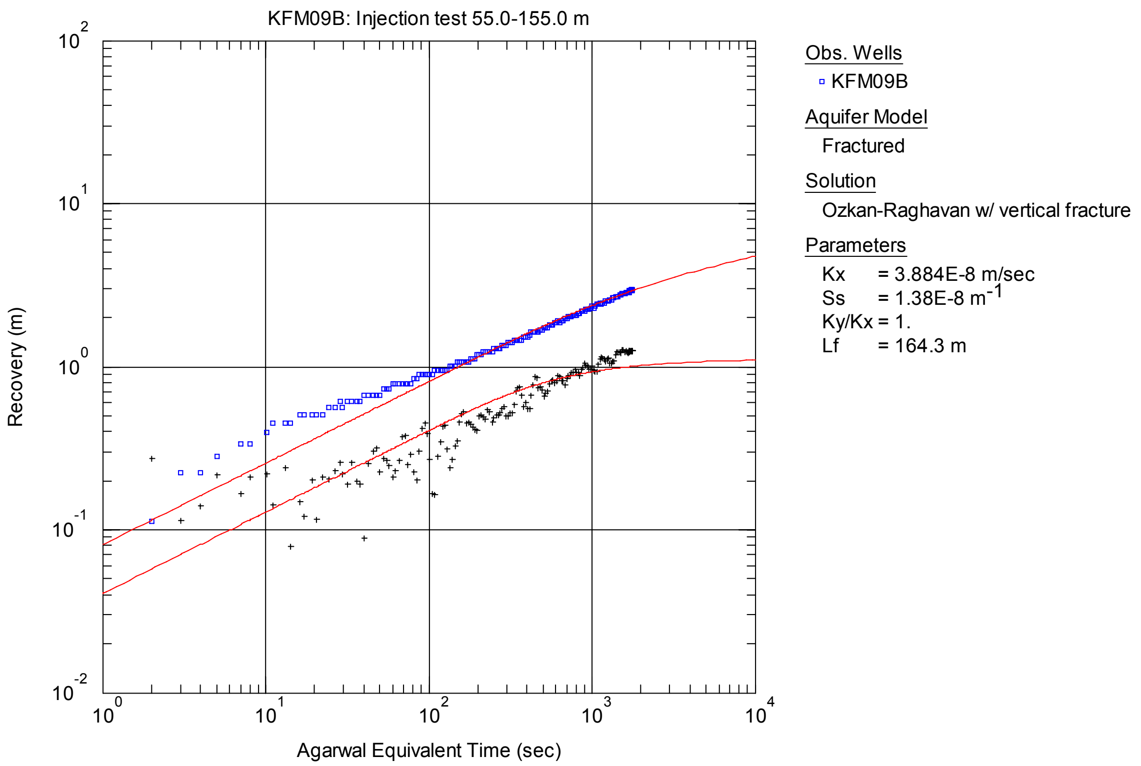


Figure A3-4. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 55.0-155.0 m in KFM09B.*

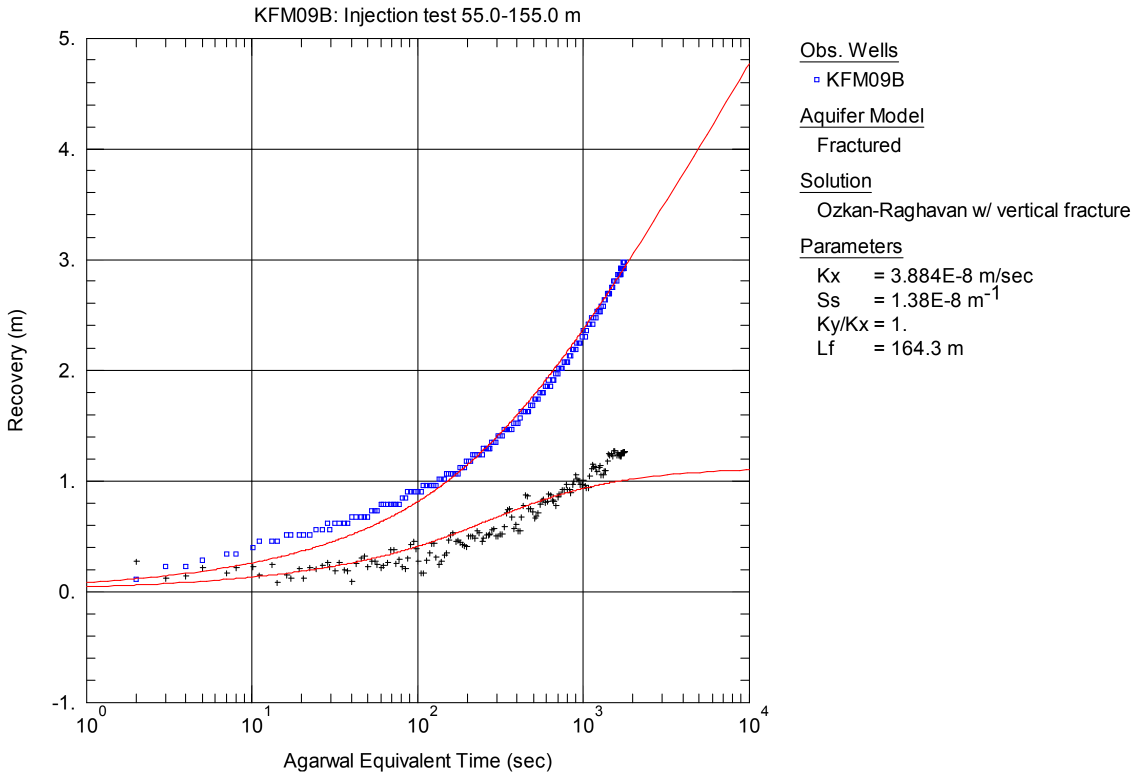


Figure A3-5. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 55.0-155.0 m in KFM09B.*

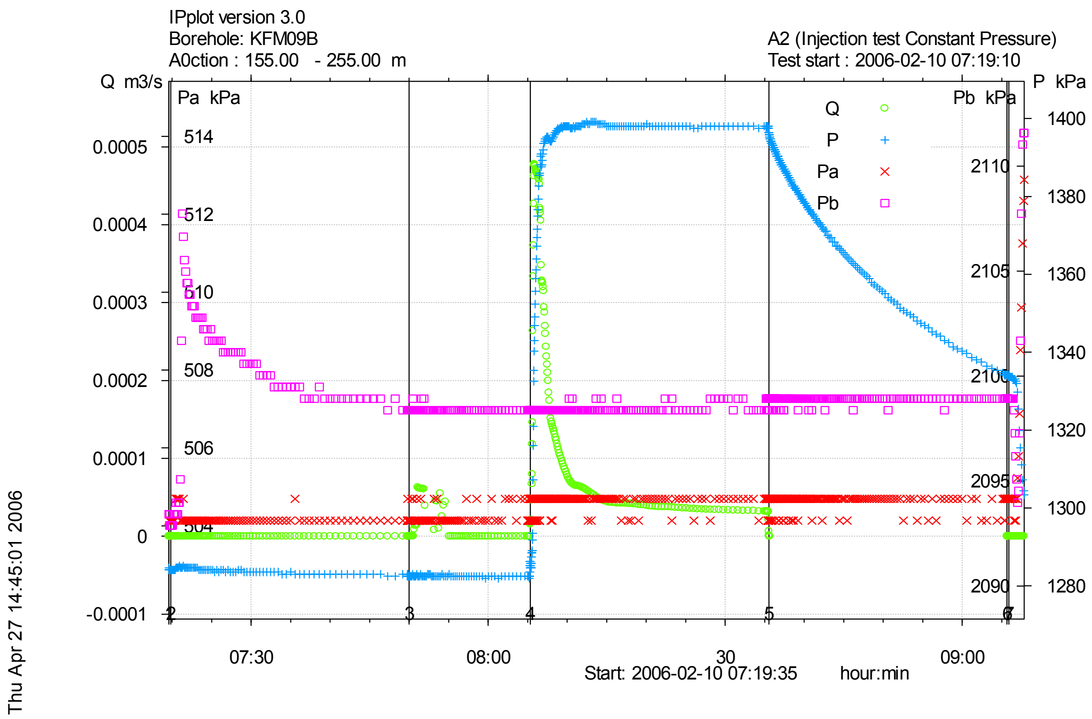


Figure A3-6. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 155.0-255.0 m in borehole KFM09B.*

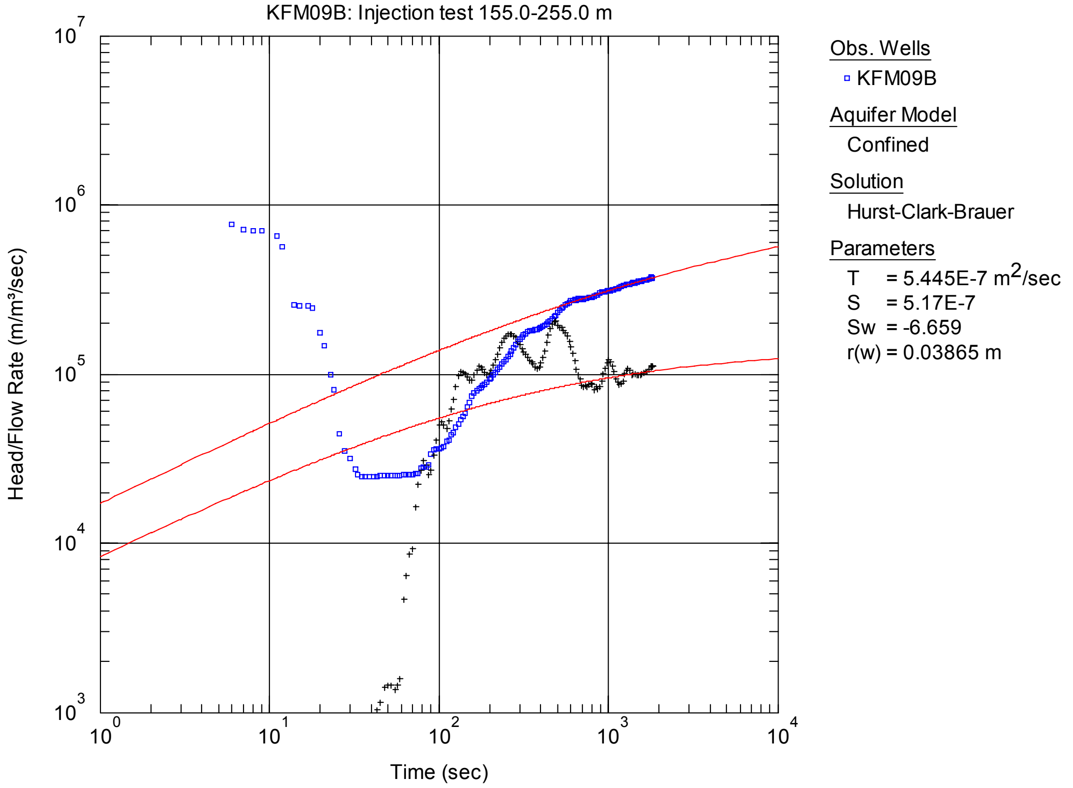


Figure A3-7. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark_Brauer solution, from the injection test in section 155.0-255.0 m in KFM09B.*

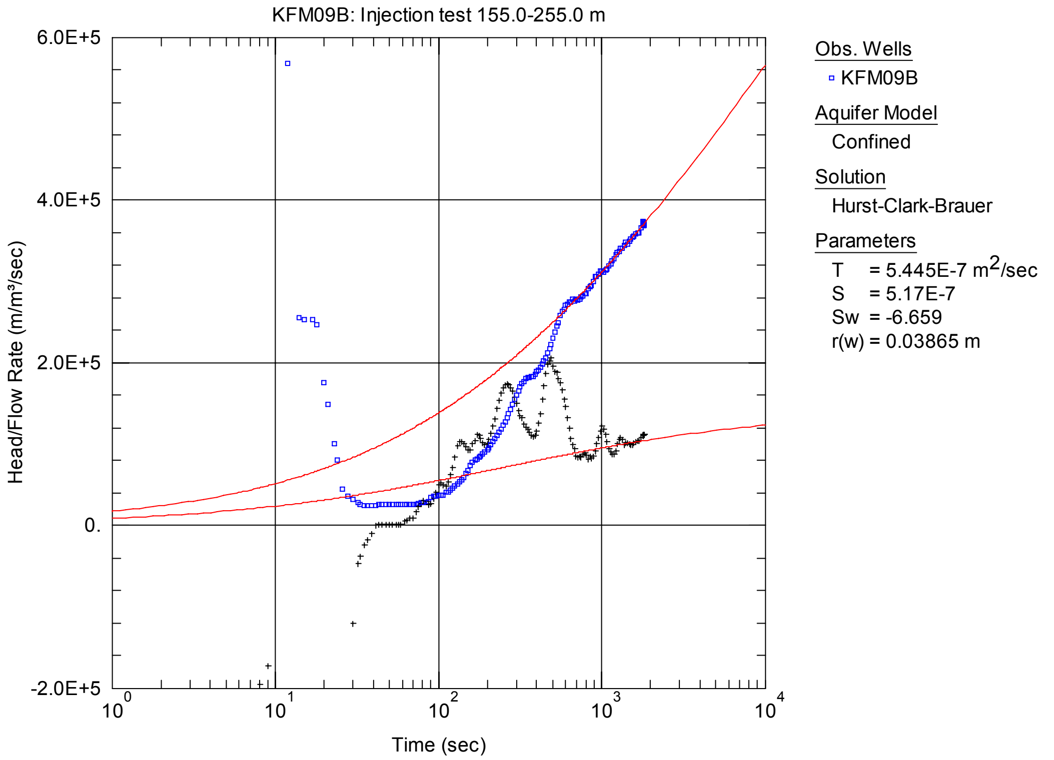


Figure A3-8. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark_Brauer solution, from the injection test in section 155.0-255.0 m in KFM09B.*

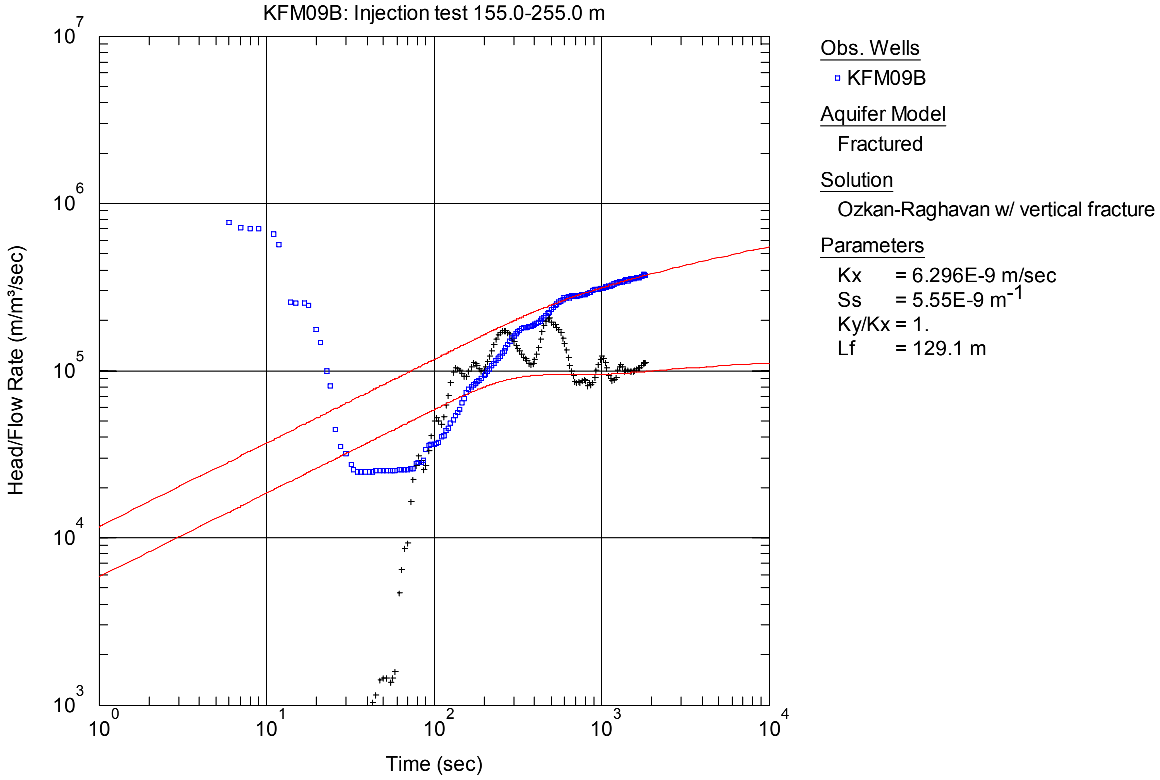


Figure A3-9. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 155.0-255.0 m in KFM09B.*

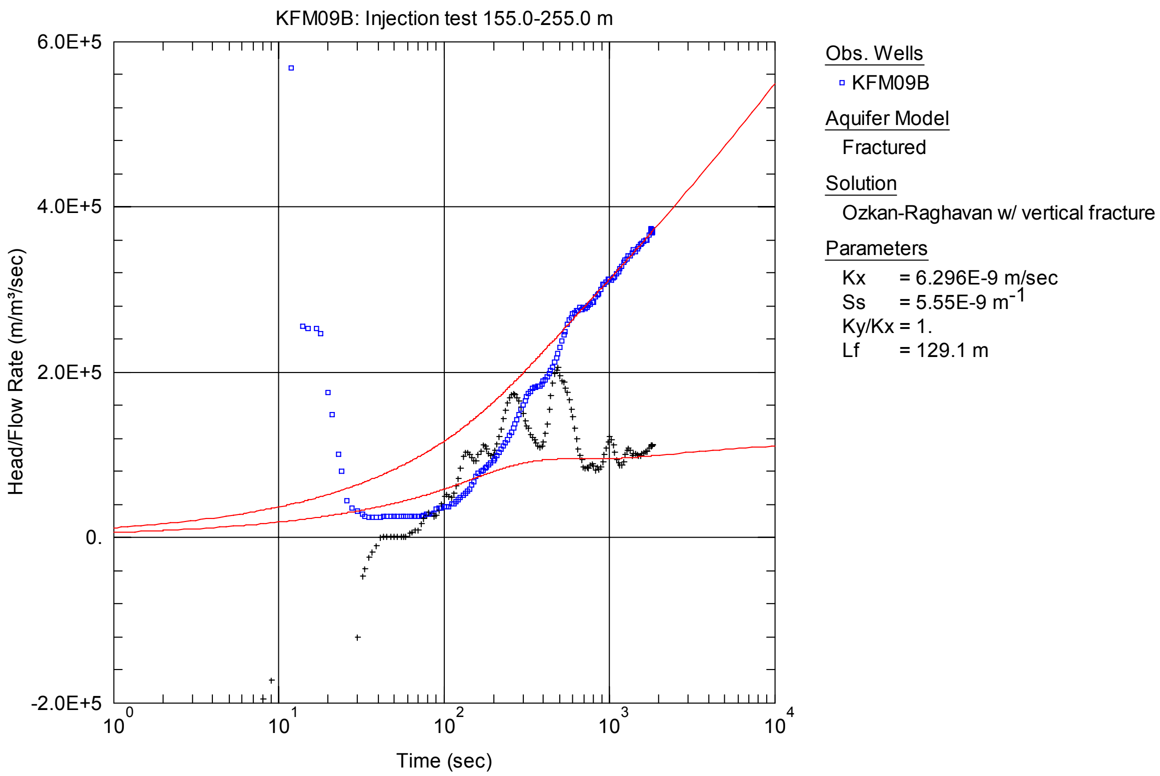


Figure A3-10. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 155.0-255.0 m in KFM09B.*

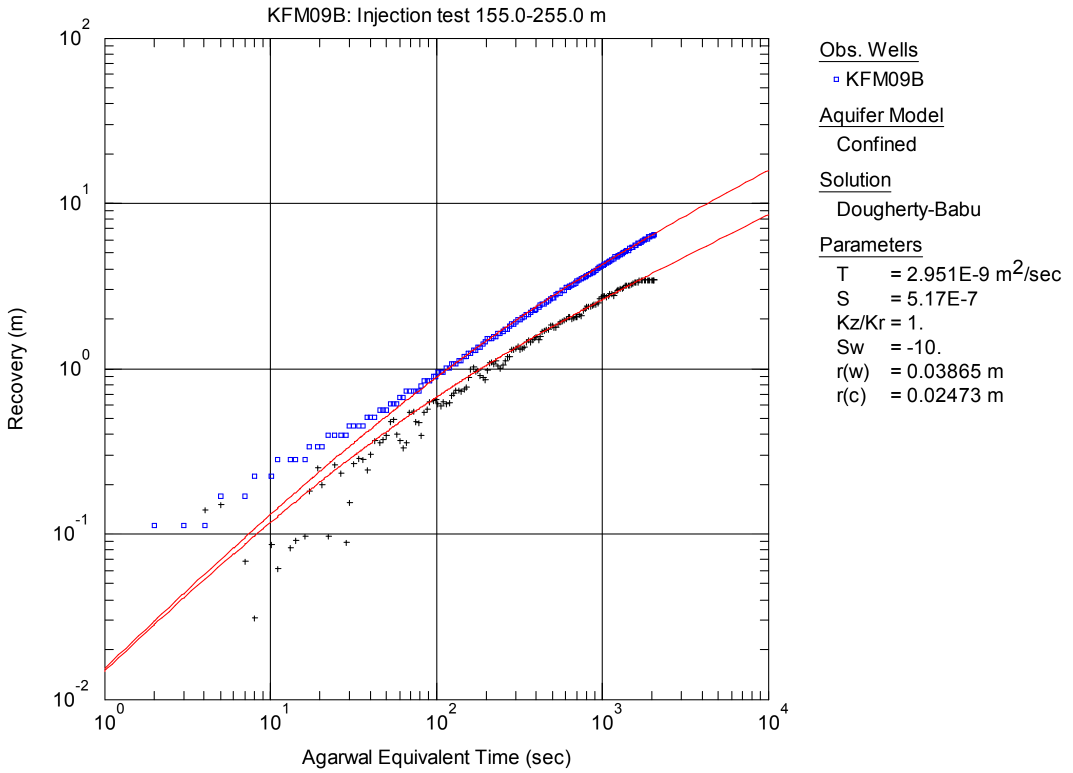


Figure A3-11. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 155.0-255.0 m in KFM09B. This solution is presented only to demonstrate the response inconsistency between the injection- and recovery period.*

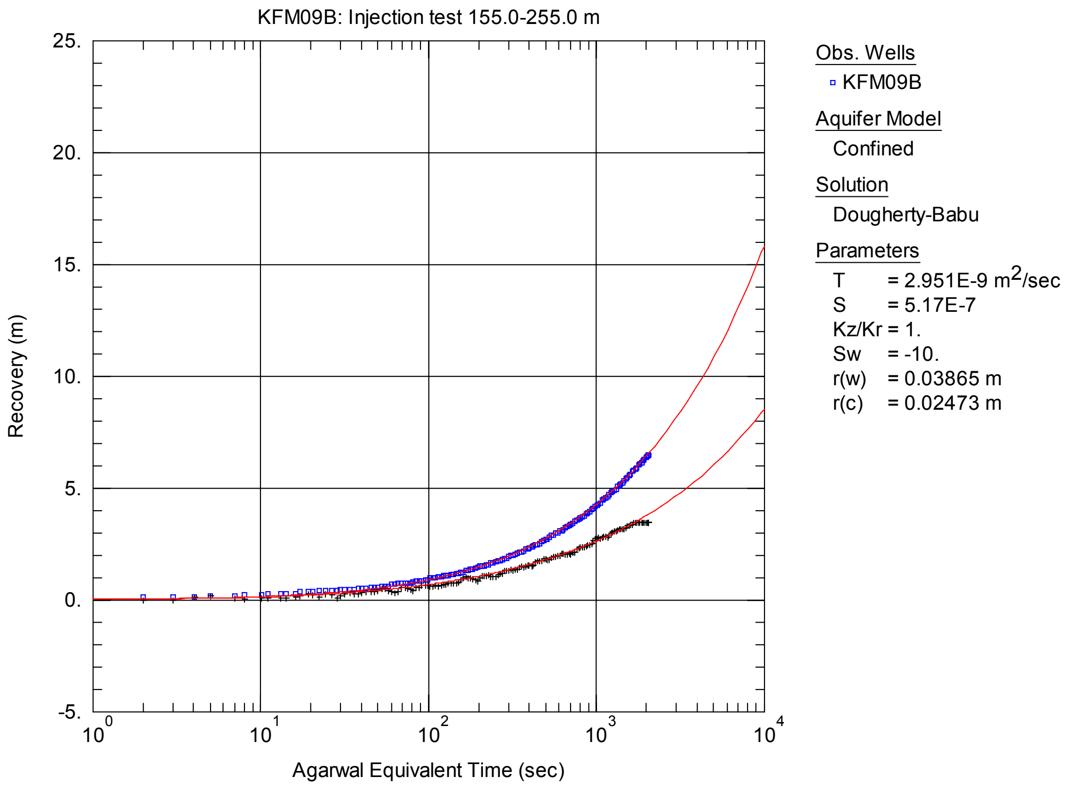


Figure A3-12. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 155.0-255.0 m in KFM09B. This solution is presented only to demonstrate the response inconsistency between the injection- and recovery period.*

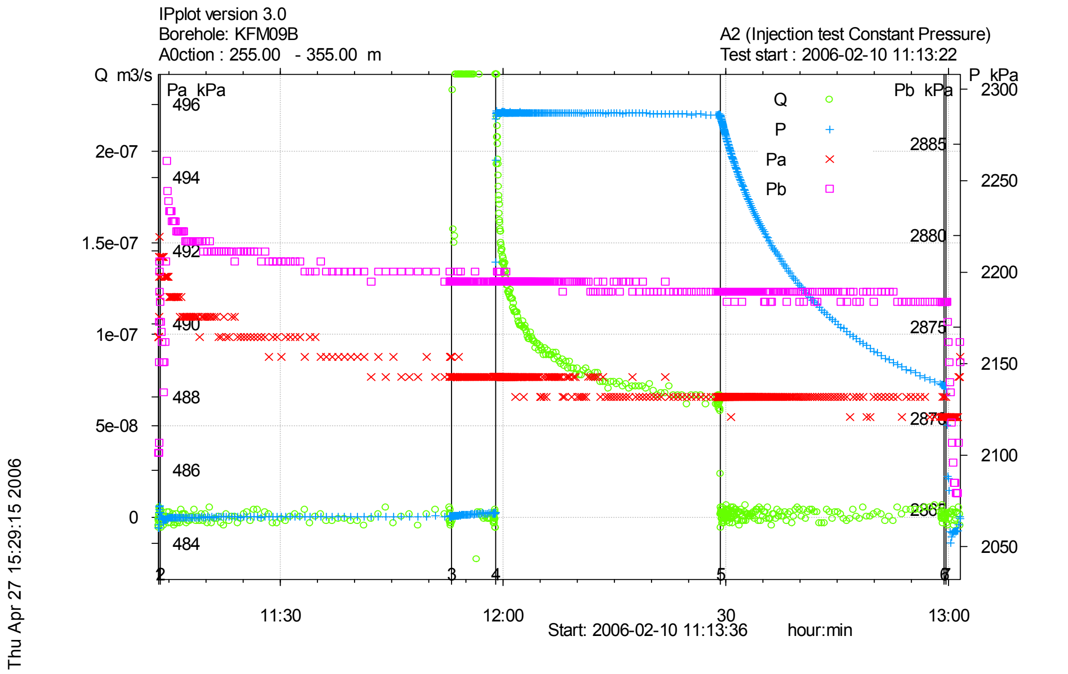


Figure A3-13. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 255.0-355.0 m in borehole KFM09B.*

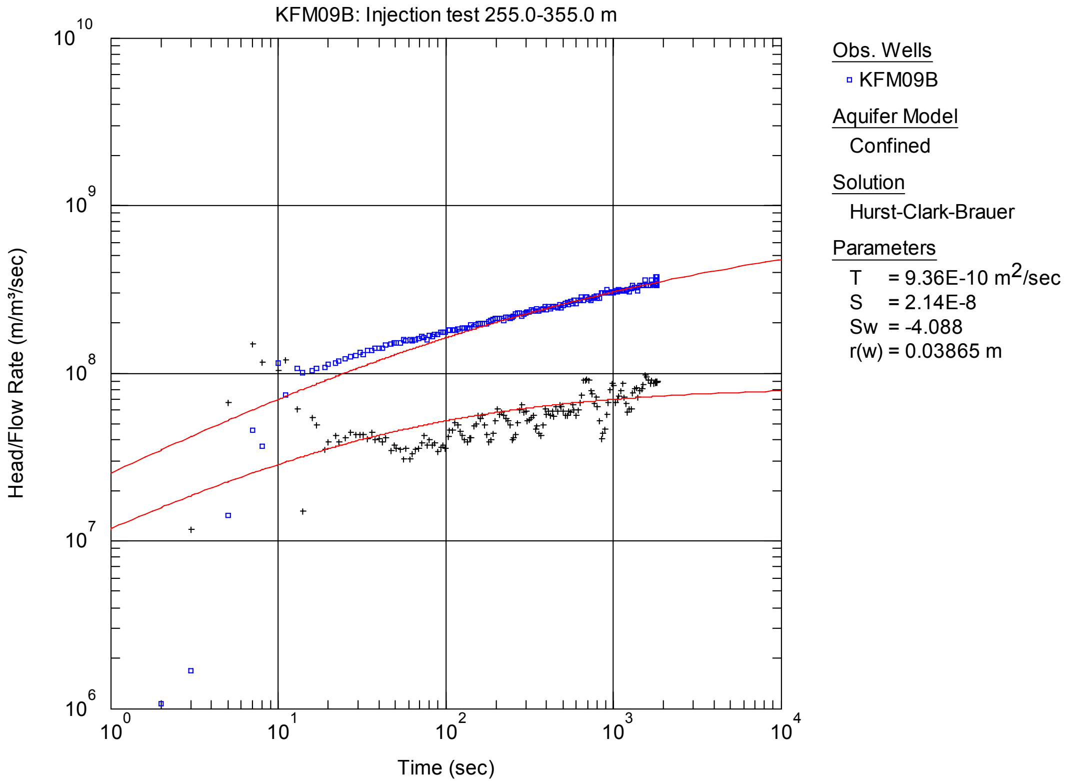


Figure A3-14. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 255.0-355.0 m in KFM09B.*

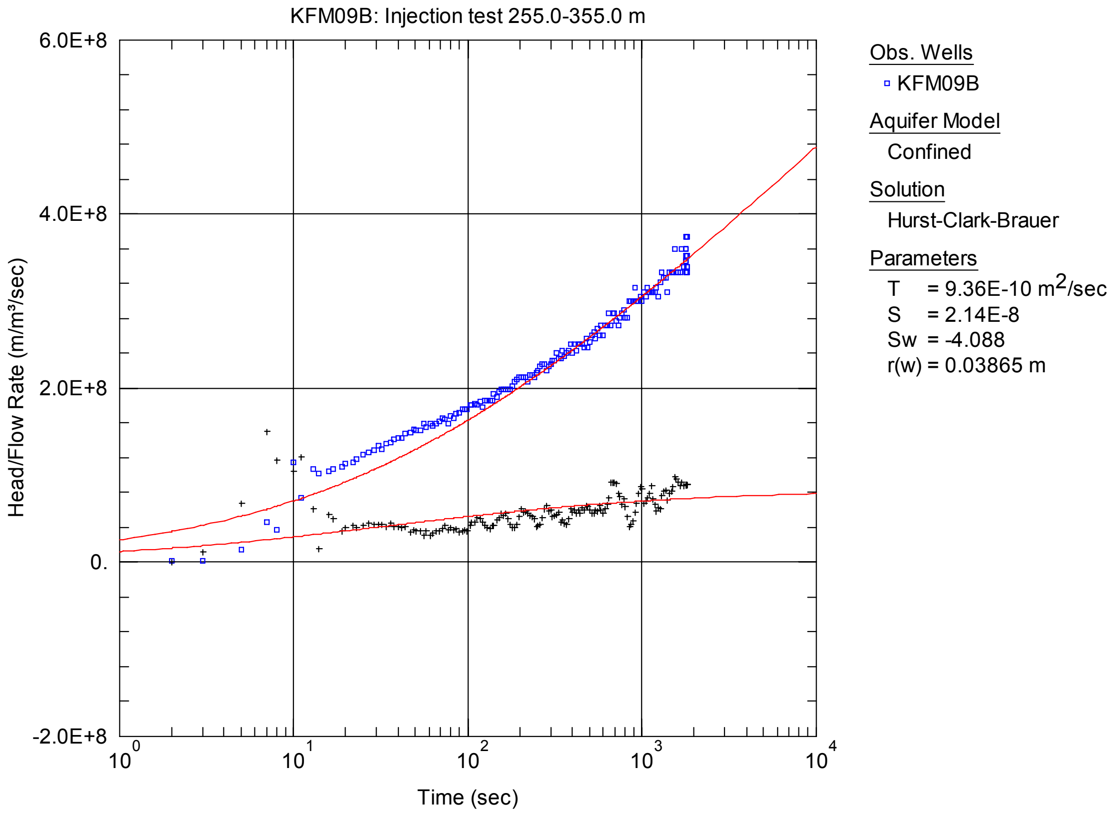


Figure A3-15. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 255.0-355.0 m in KFM09B.*

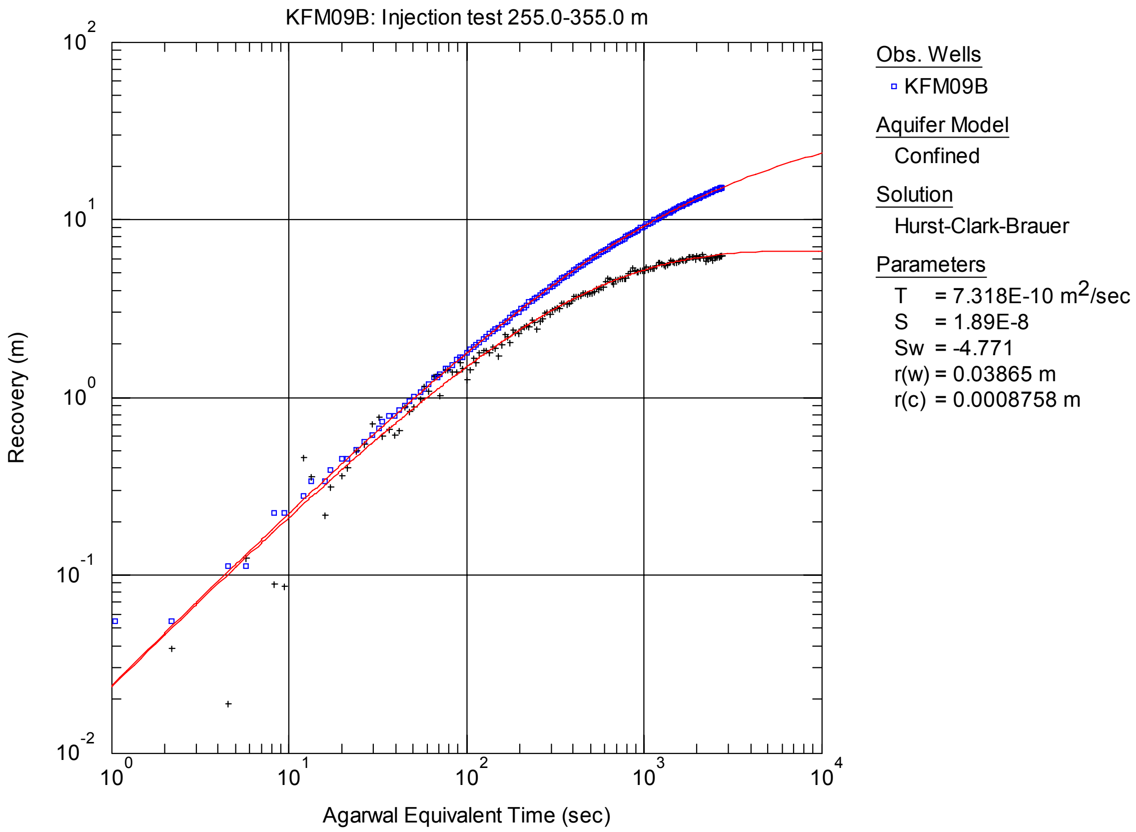


Figure A3-16. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 255.0-355.0 m in KFM09B.*

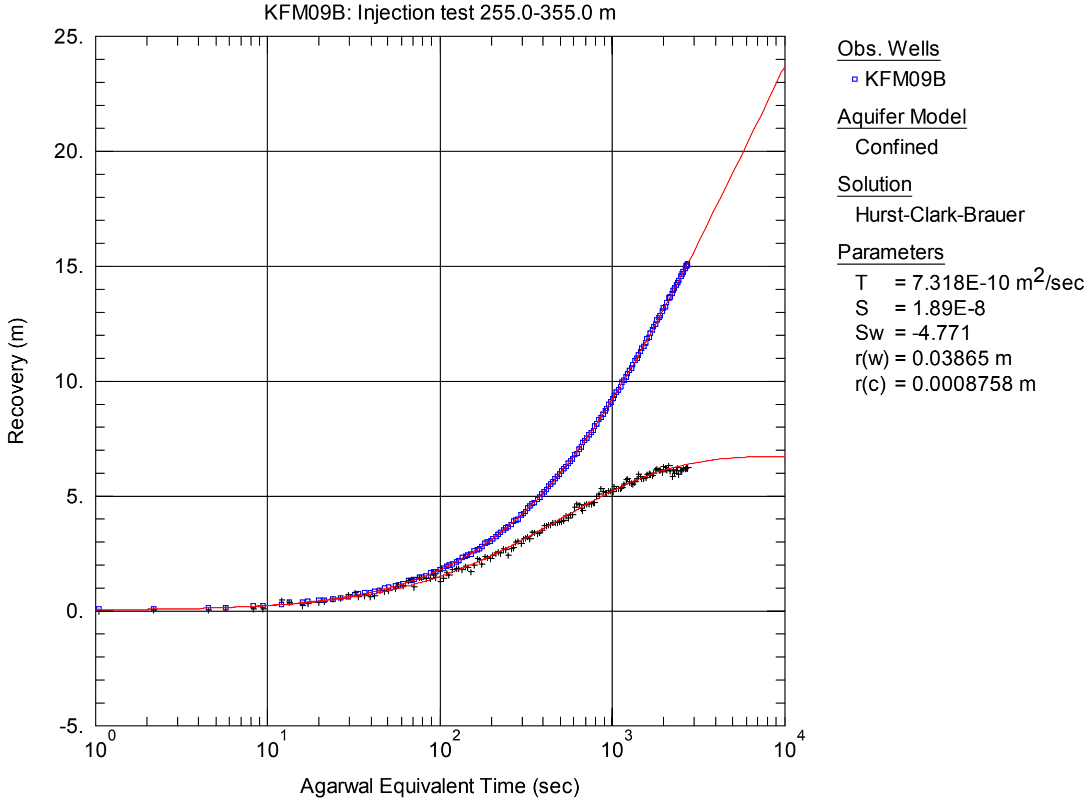


Figure A3-17. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 255.0-355.0 m in KFM09B.*

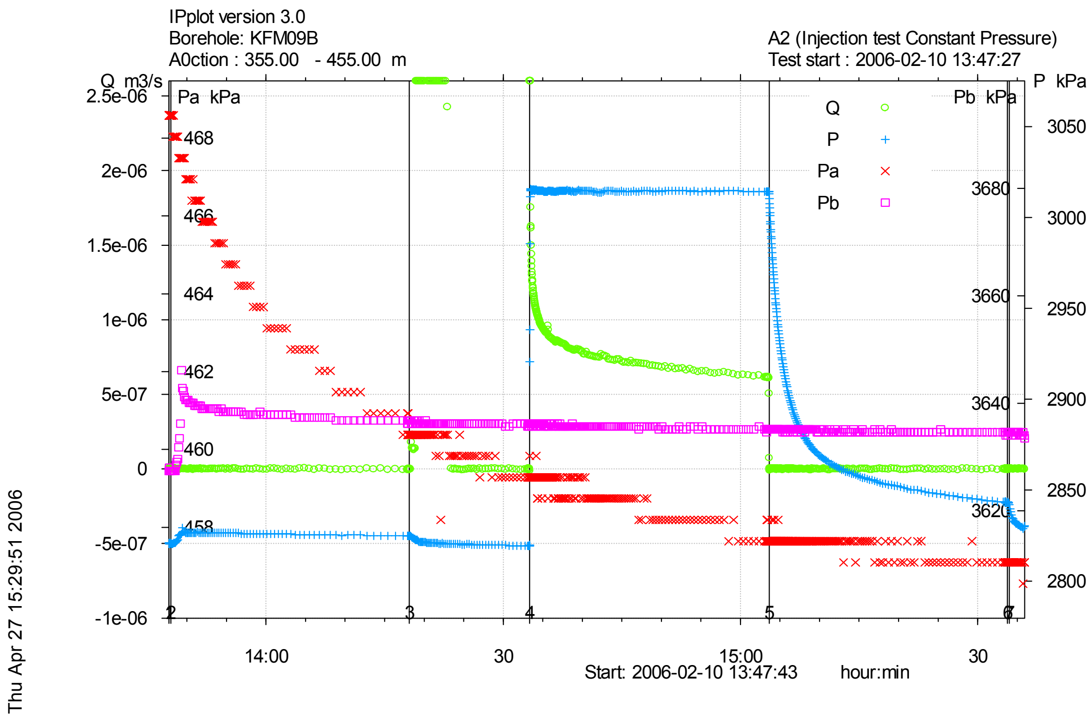


Figure A3-18. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 355.0-455.0 m in borehole KFM09B.*

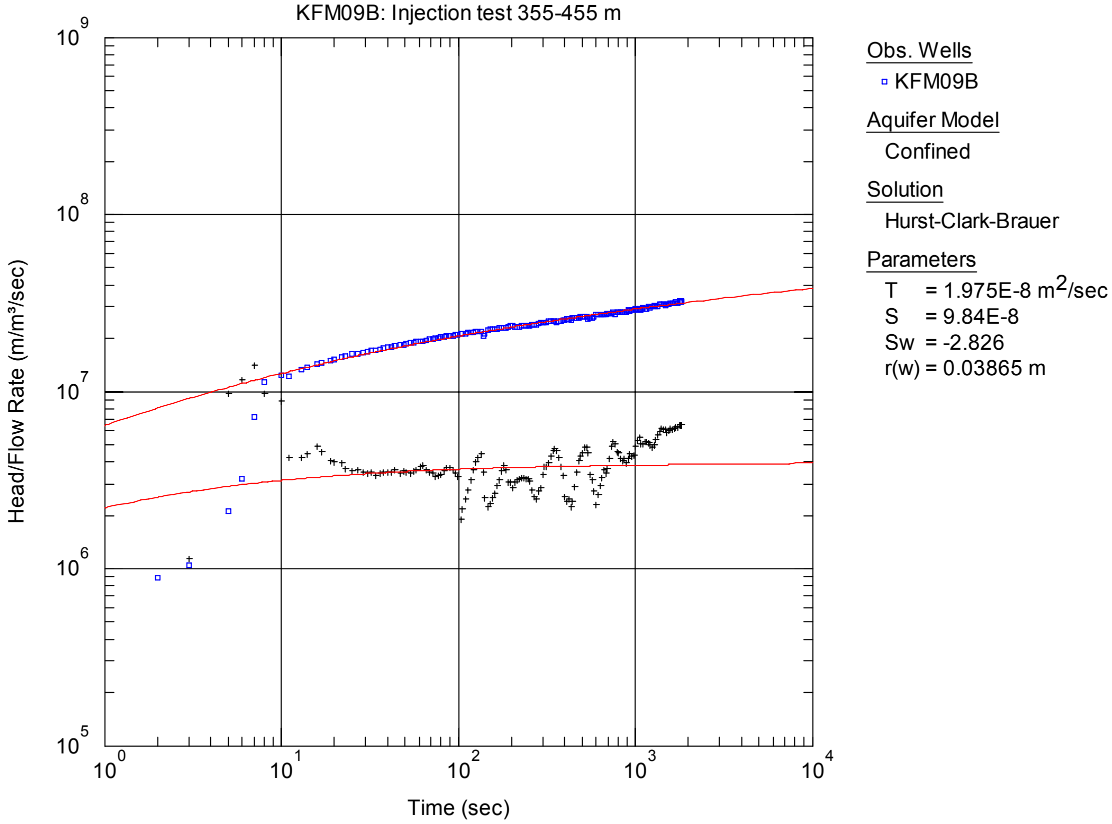


Figure A3-19. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 355.0-455.0 m in KFM09B.*

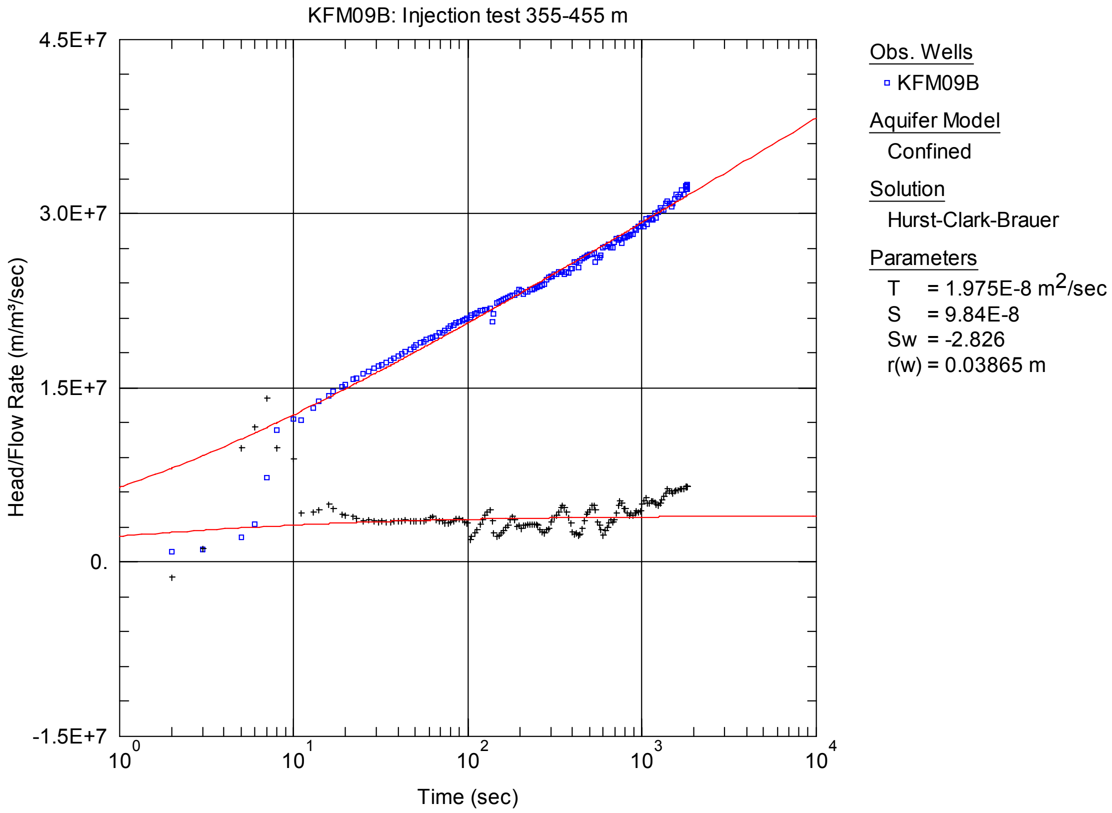


Figure A3-20. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 355.0-455.0 m in KFM09B.*

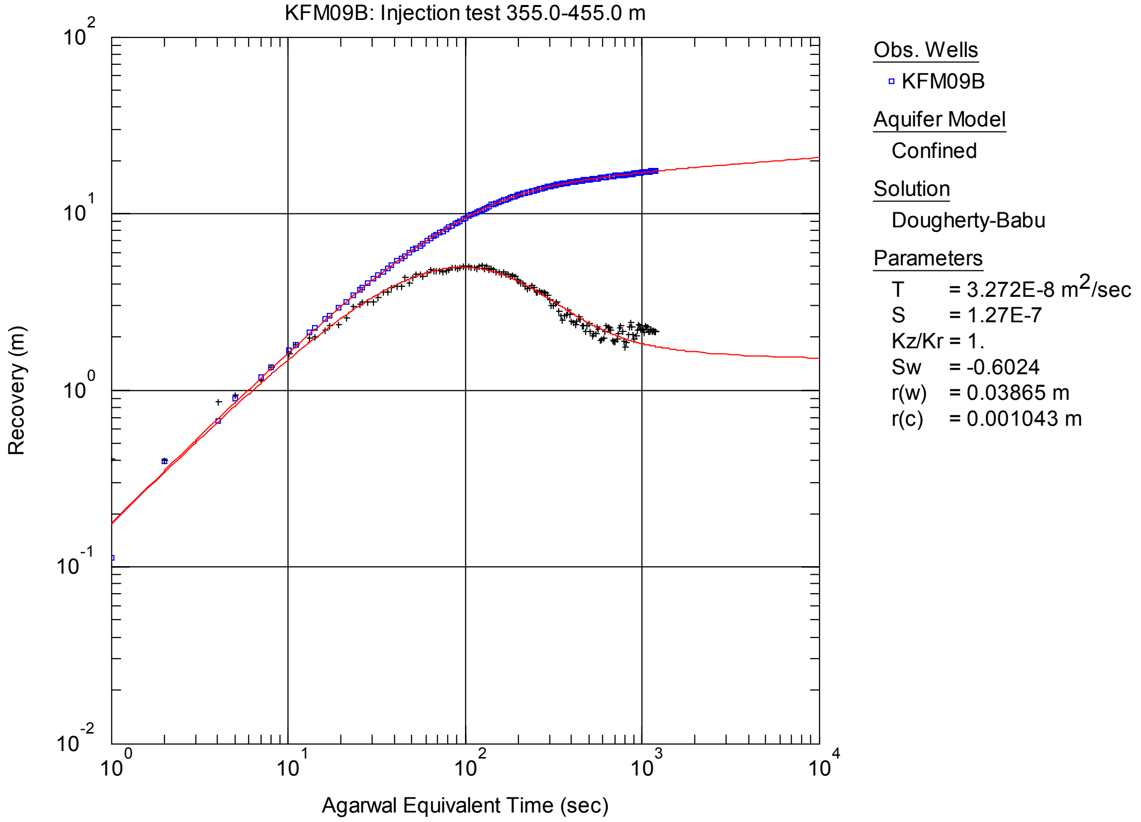


Figure A3-21. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 355.0-455.0 m in KFM09B.*

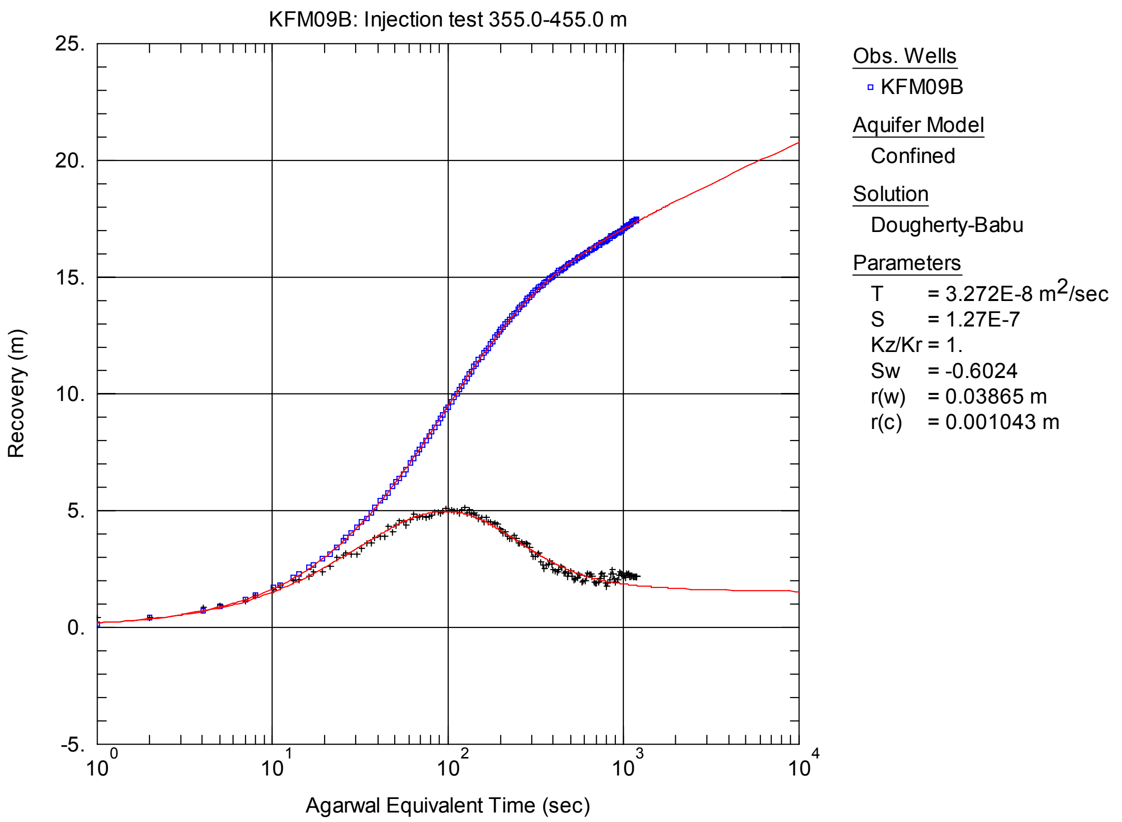


Figure A3-22. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 355.0-455.0 m in KFM09B.*

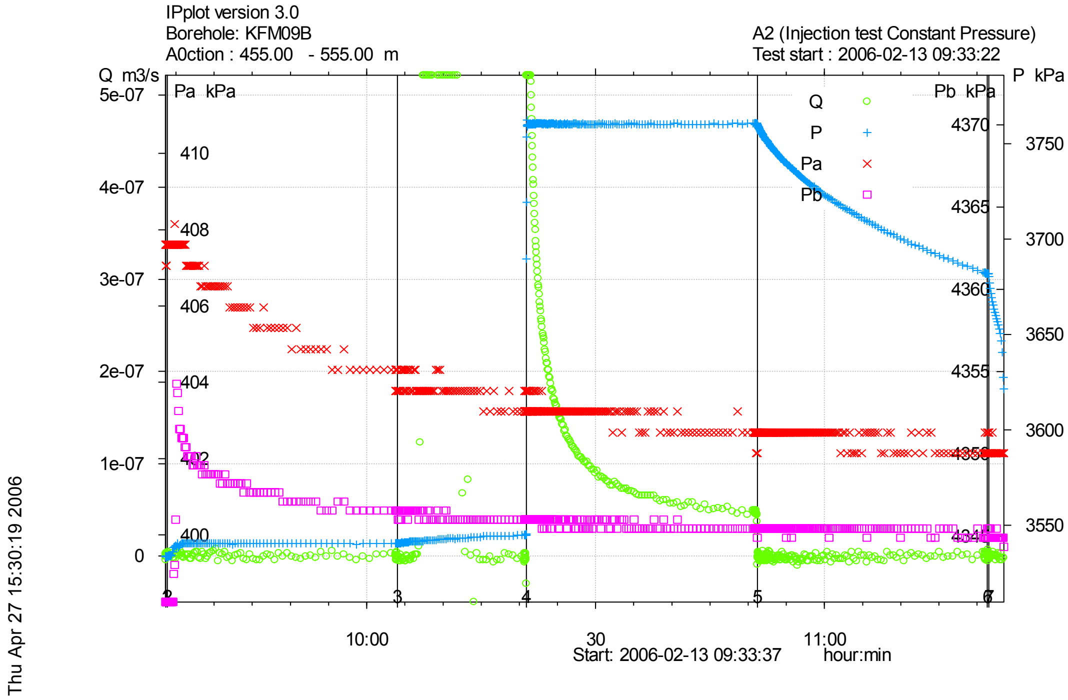


Figure A3-23. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 455.0-555.0 m in borehole KFM09B.*

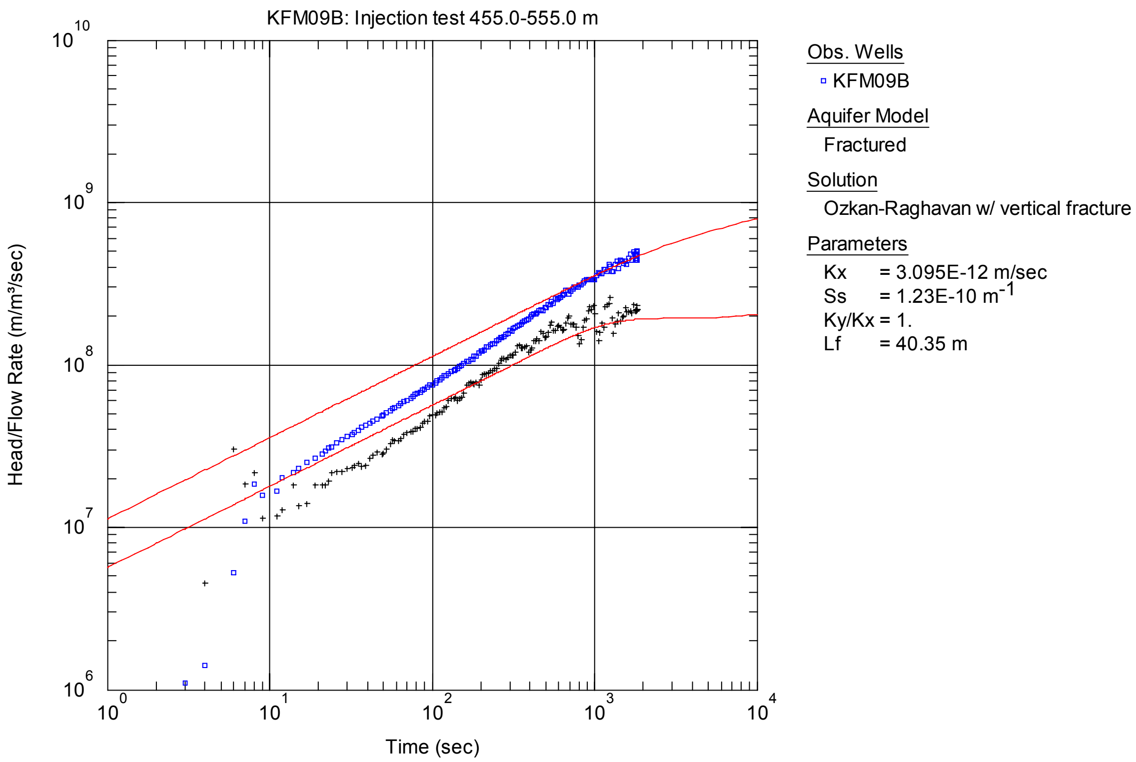


Figure A3-24. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 455.0-555.0 m in KFM09B.*

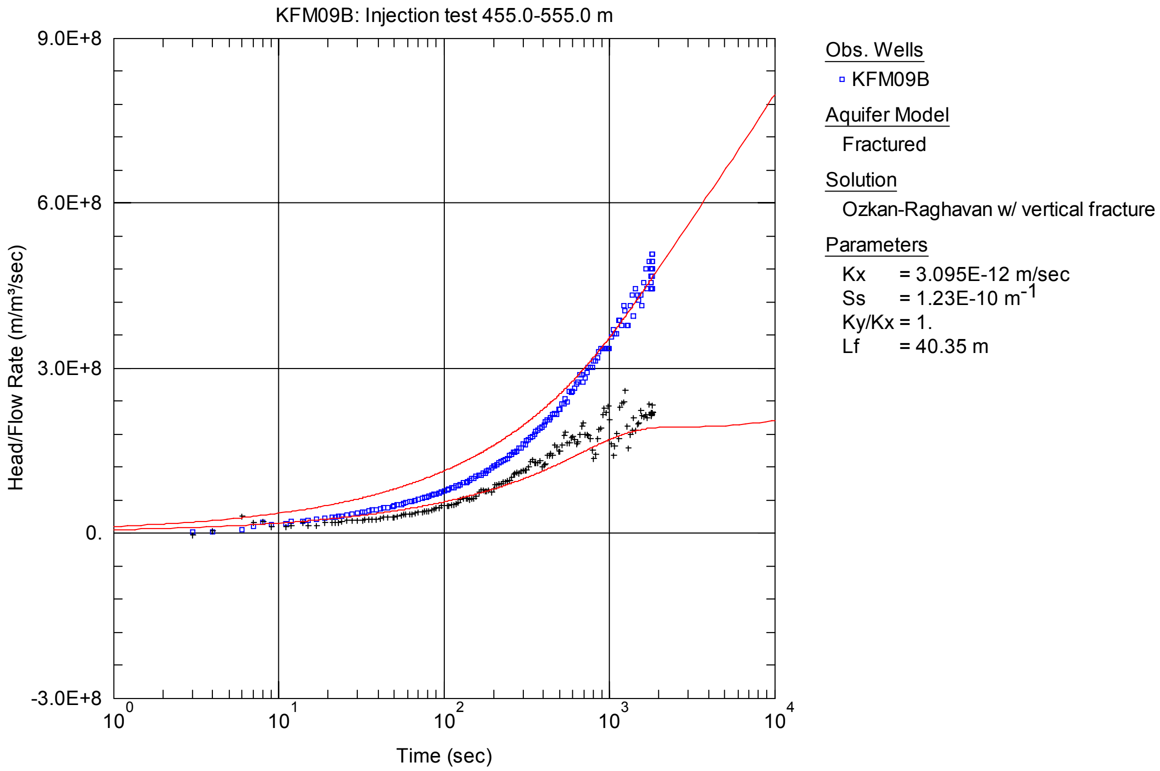


Figure A3-25. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 455.0-555.0 m in KFM09B.*

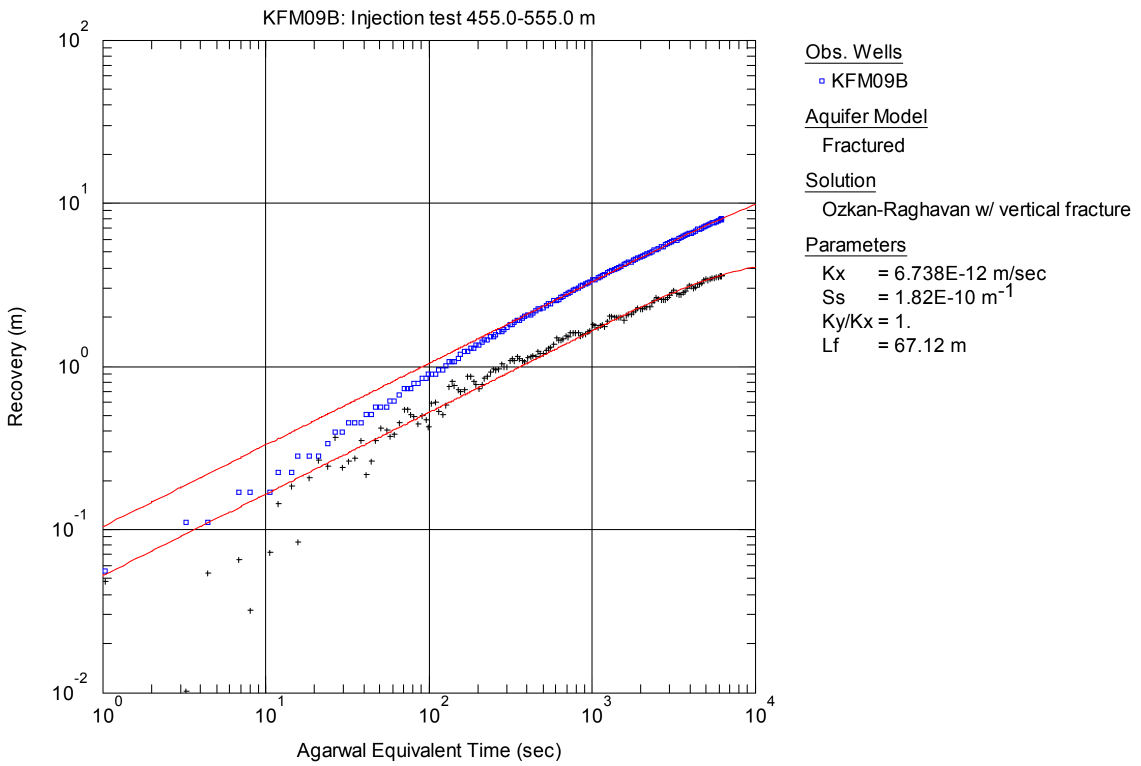


Figure A3-26. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 455.0-555.0 m in KFM09B.*

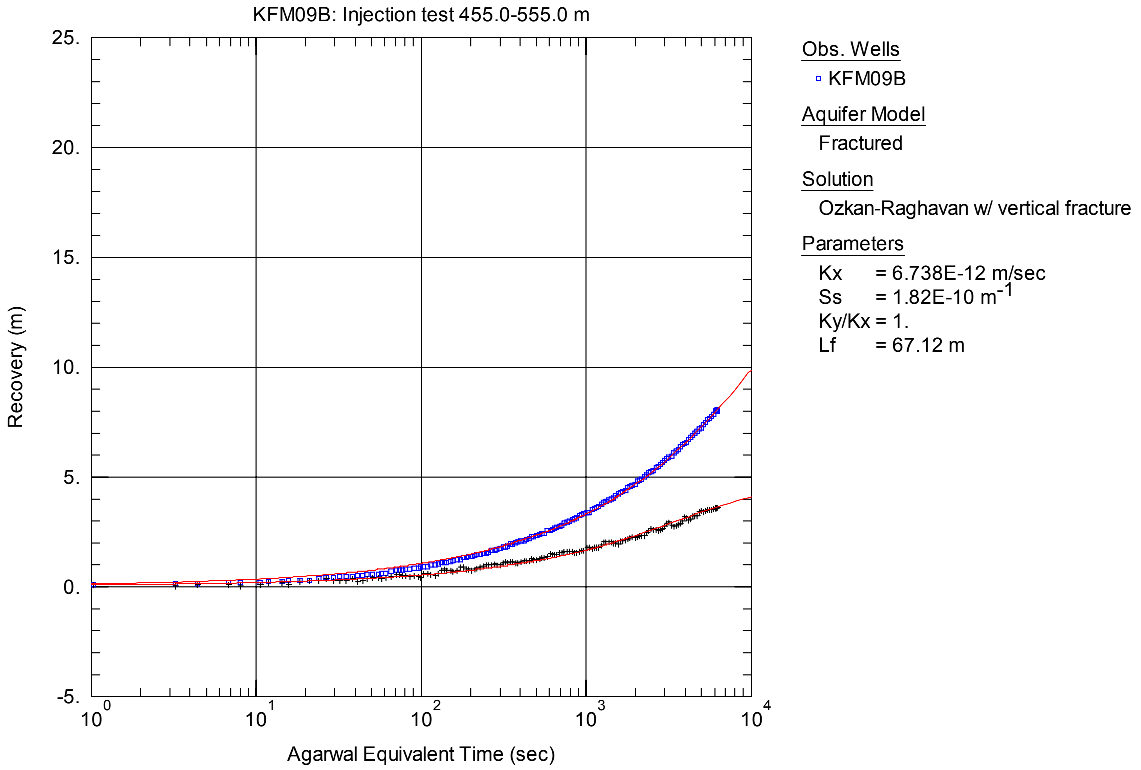


Figure A3-27. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 455.0-555.0 m in KFM09B.*

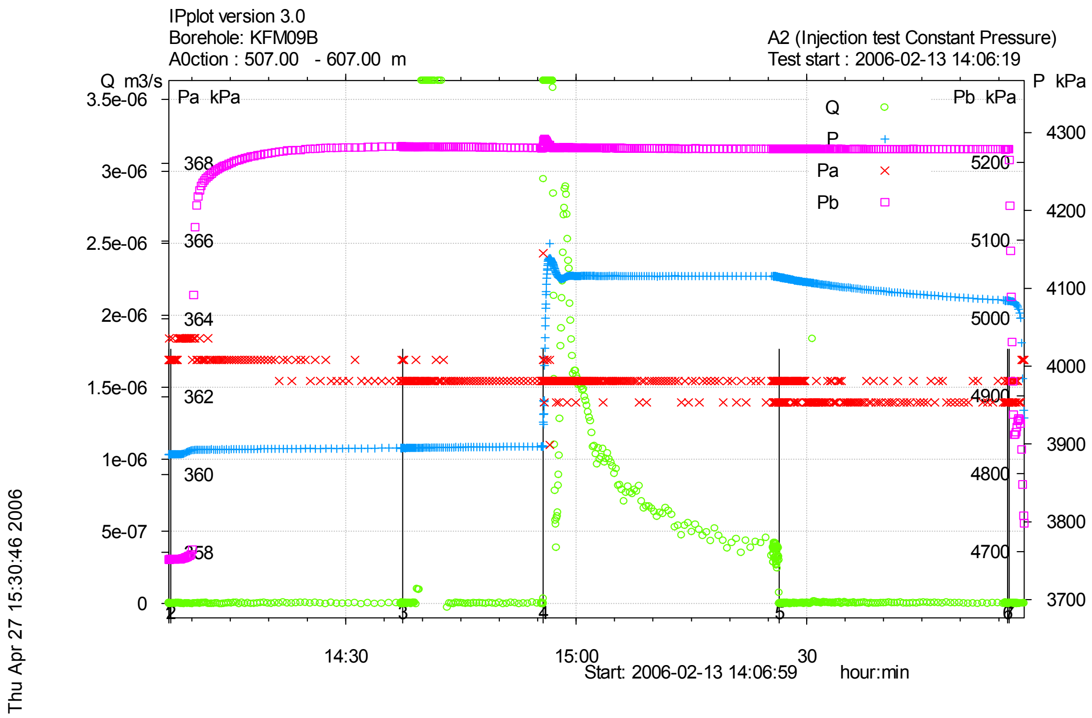


Figure A3-28. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 507.0-607.0 m in borehole KFM09B.*

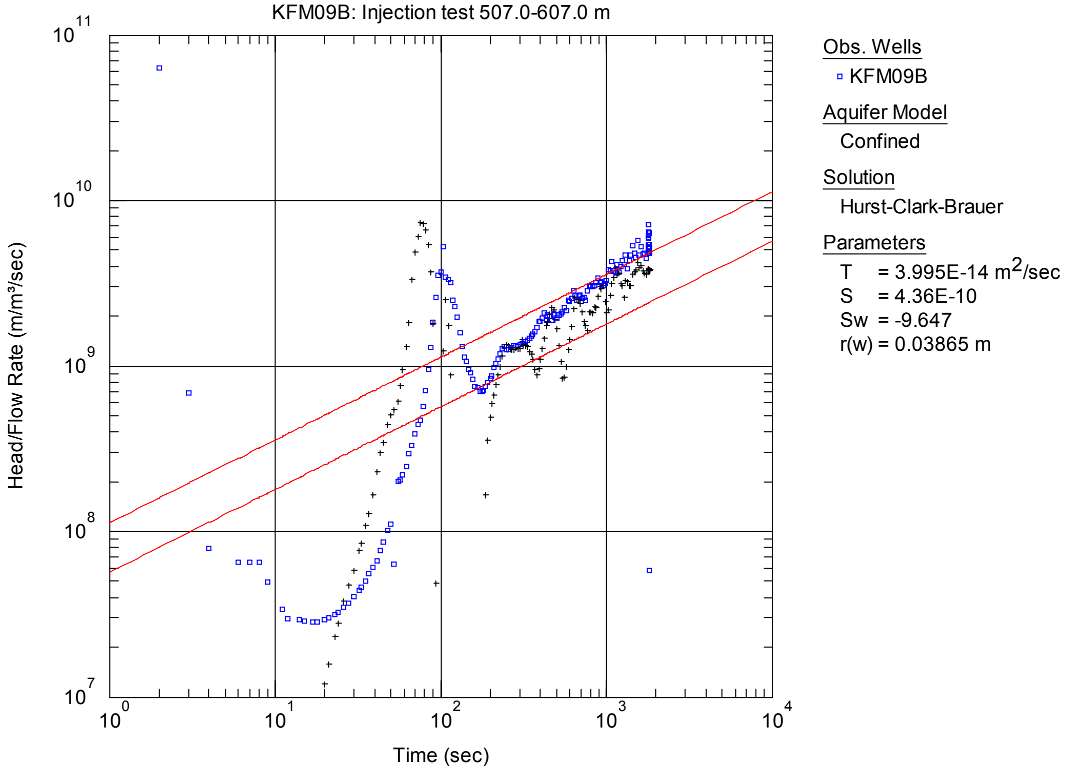


Figure A3-29. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 507.0-607.0 m in KFM09B. This solution is presented only to demonstrate the great response inconsistency between the injection- and recovery period.*

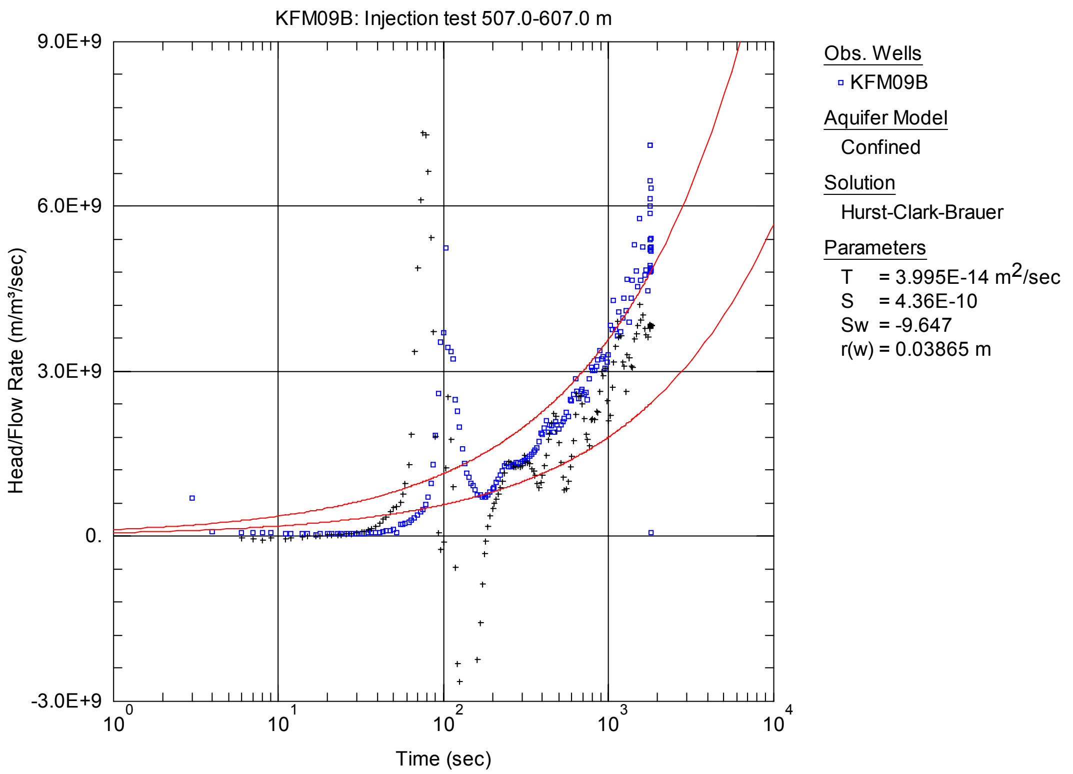


Figure A3-30. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 507.0-607.0 m in KFM09B. This solution is presented only to demonstrate the great response inconsistency between the injection- and recovery period.*

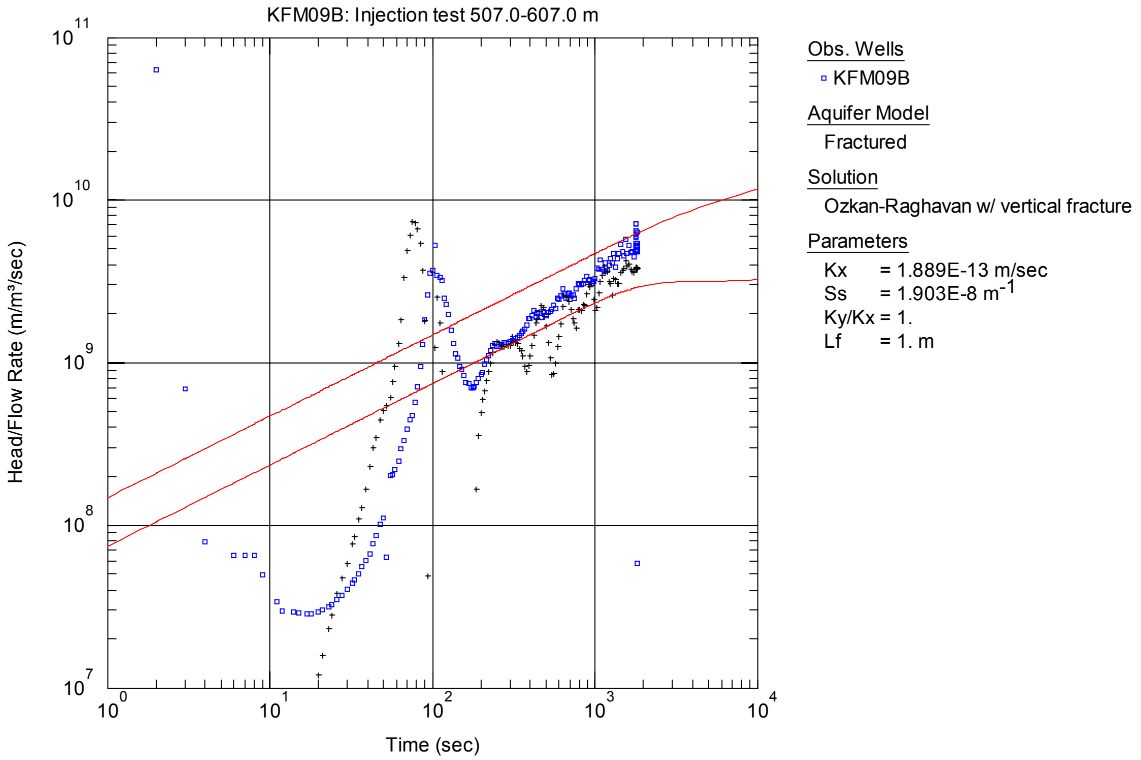


Figure A3-31. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 507.0-607.0 m in KFM09B. This solution is presented only to demonstrate the great response inconsistency between the injection- and recovery period.*

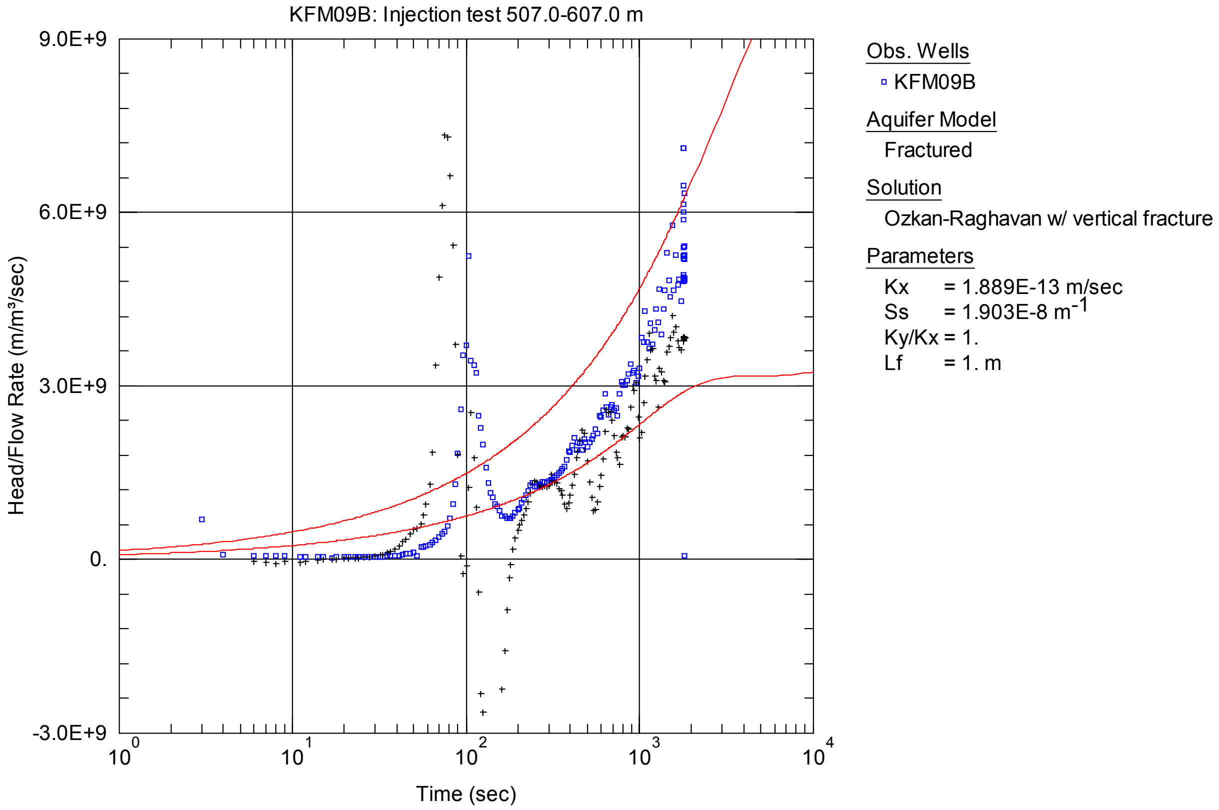


Figure A3-32. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 507.0-607.0 m in KFM09B. This solution is presented only to demonstrate the great response inconsistency between the injection- and recovery period.*

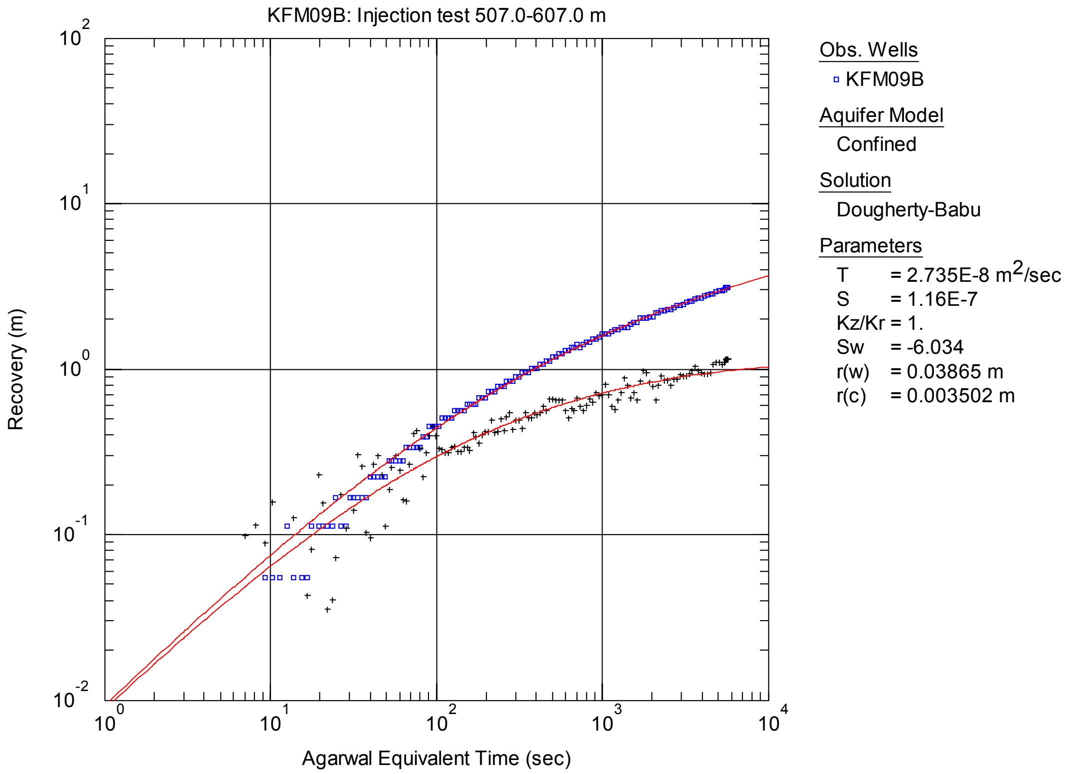


Figure A3-33. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Dougherty-Babu solution, from the injection test in section 507.0-607.0 m in KFM09B.*

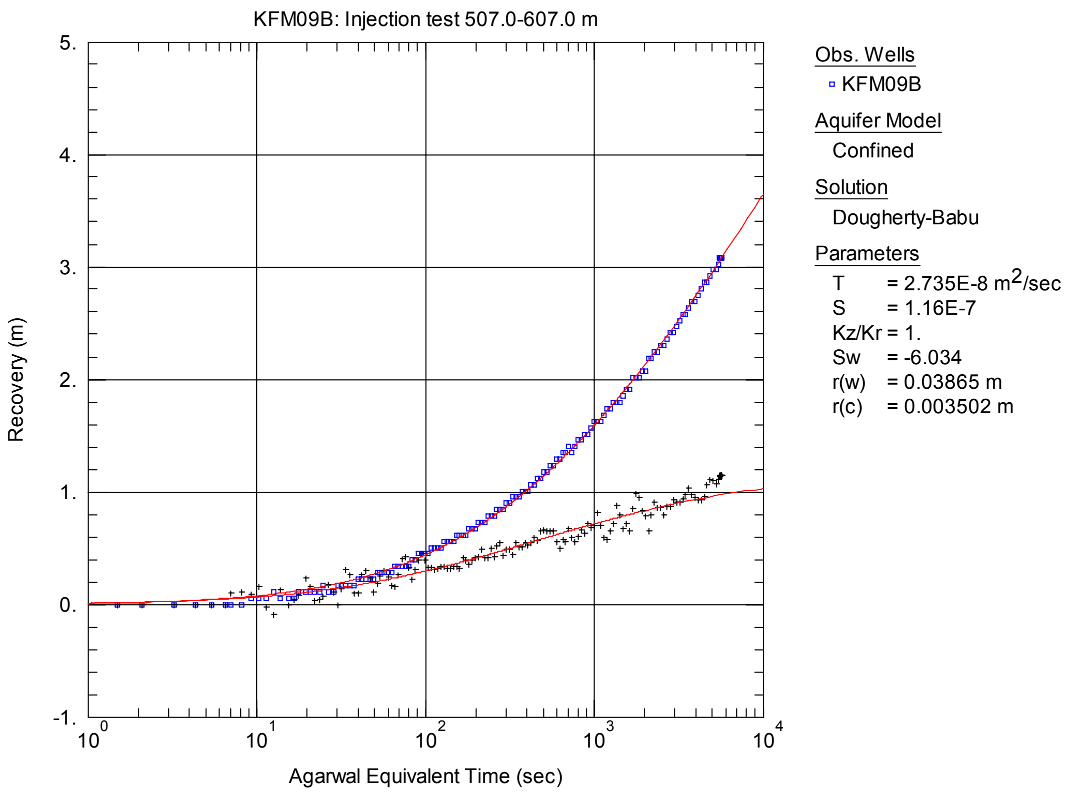


Figure A3-34. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Dougherty-Babu solution, from the injection test in section 507.0-607.0 m in KFM09B.*

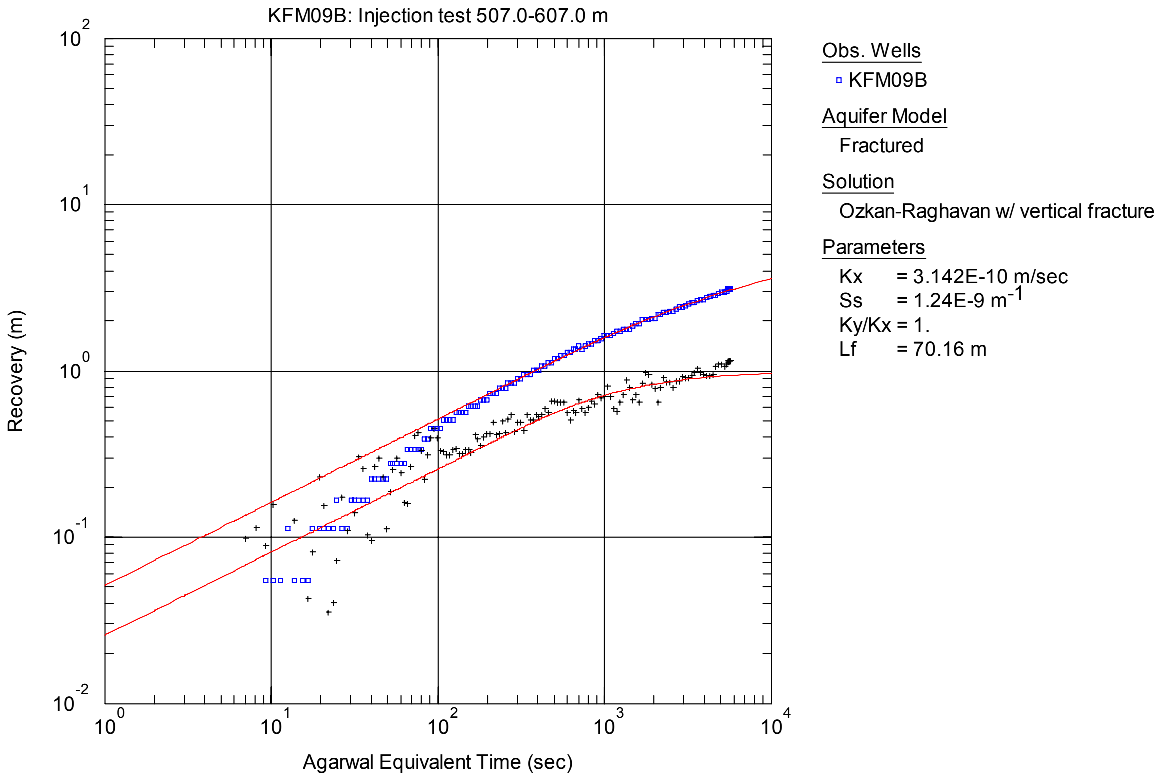


Figure A3-35. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 507.0-607.0 m in KFM09B.*

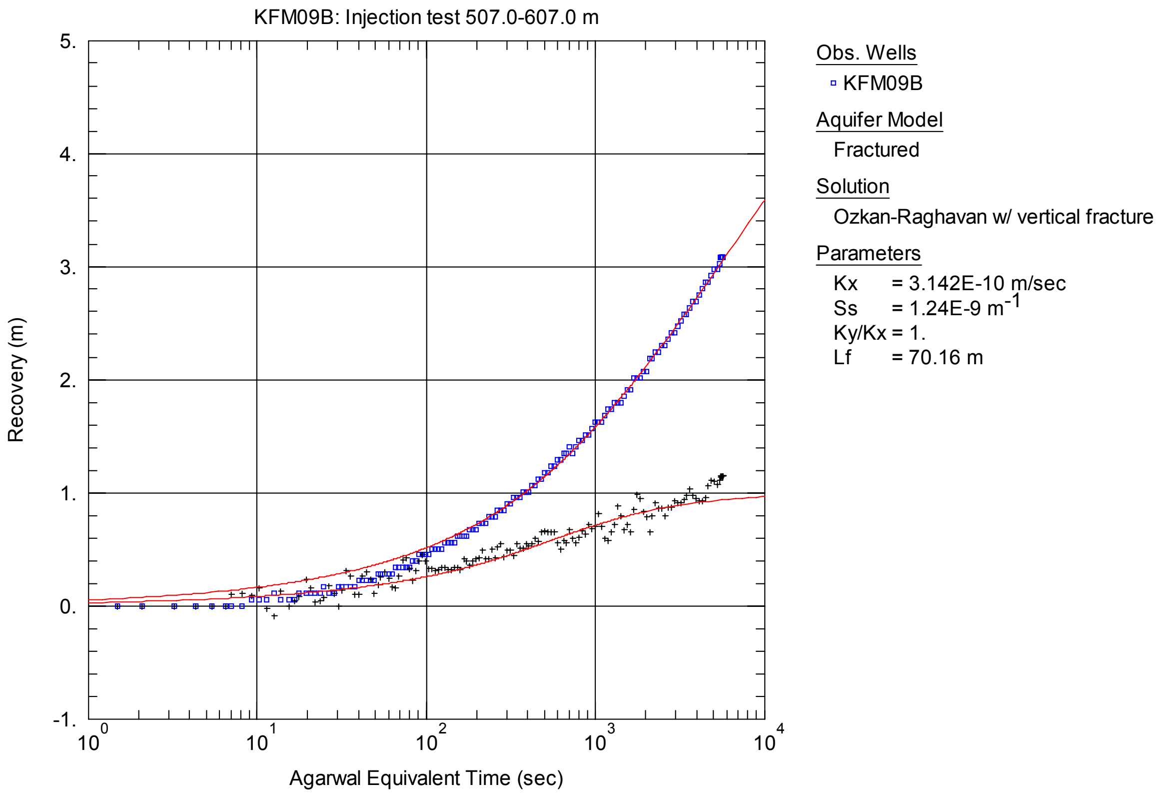


Figure A3-36. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 507.0-607.0 m in KFM09B.*

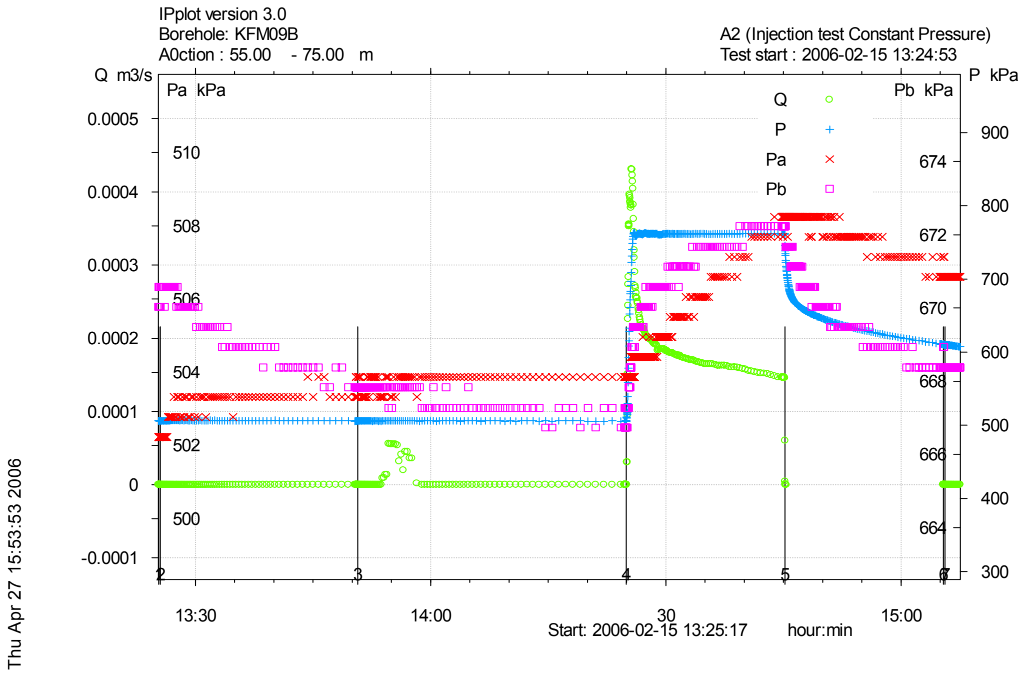


Figure A3-37. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 55.0-75.0 m in borehole KFM09B.

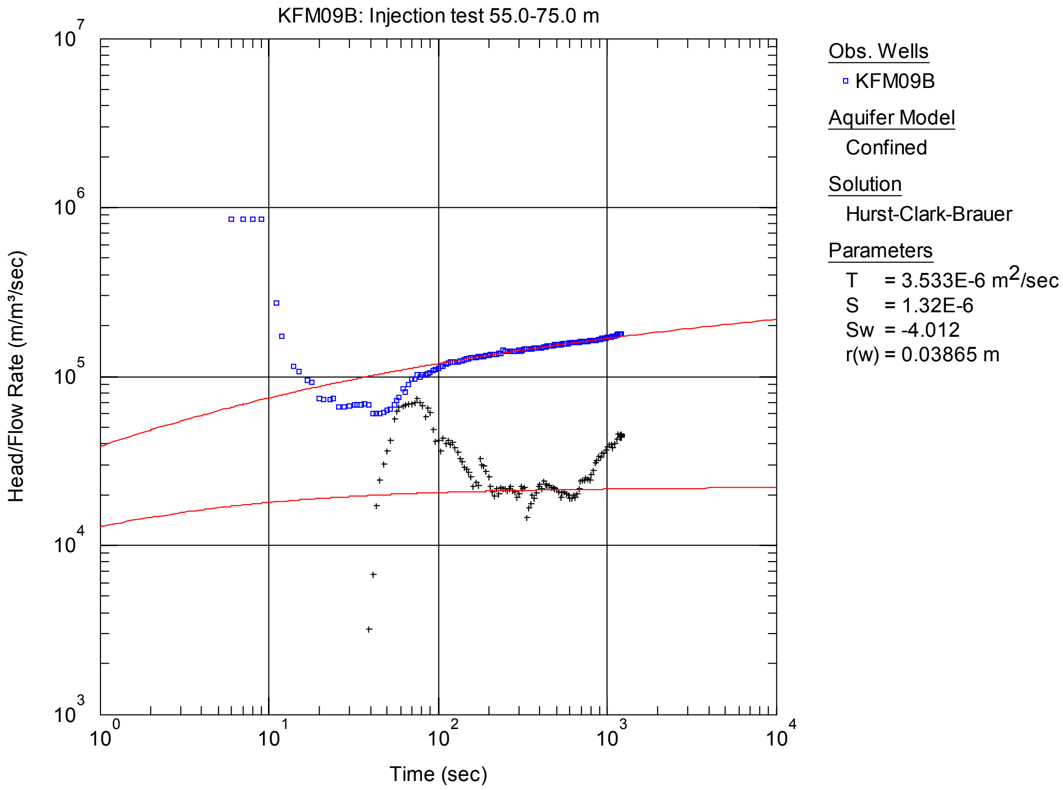


Figure A3-38. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 55.0-75.0 m in KFM09B.

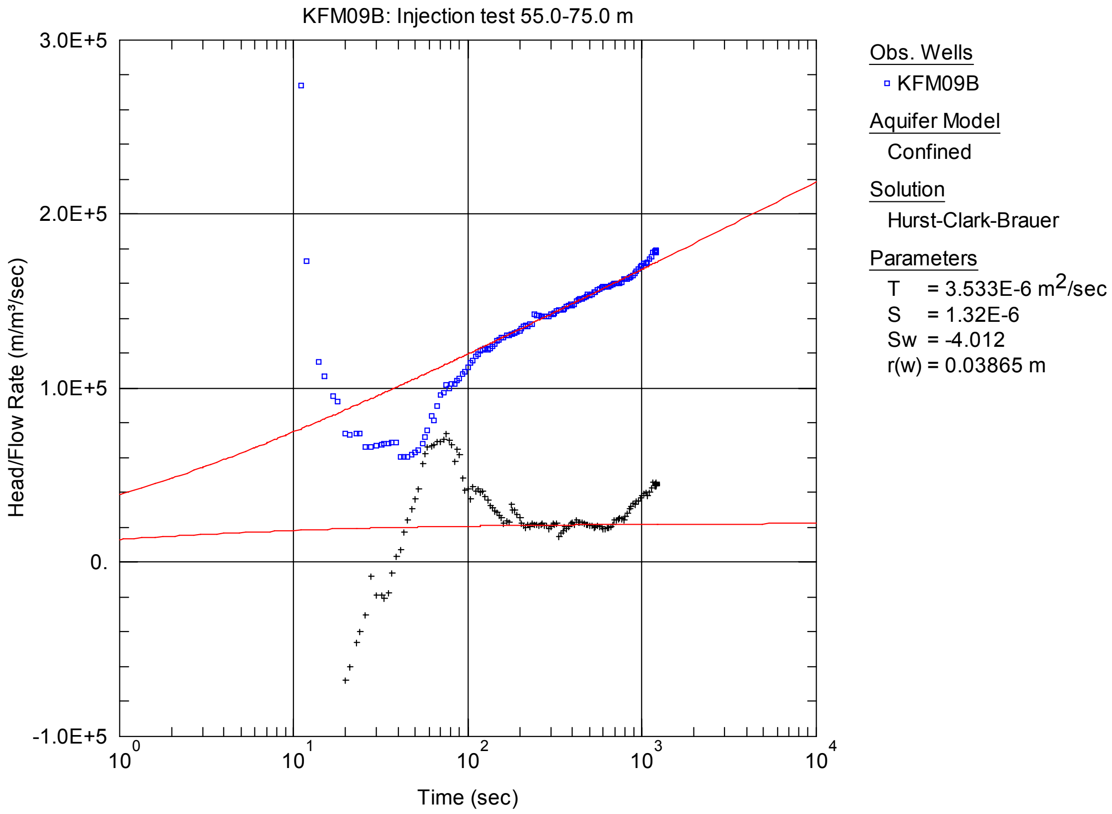


Figure A3-39. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 55.0-75.0 m in KFM09B.*

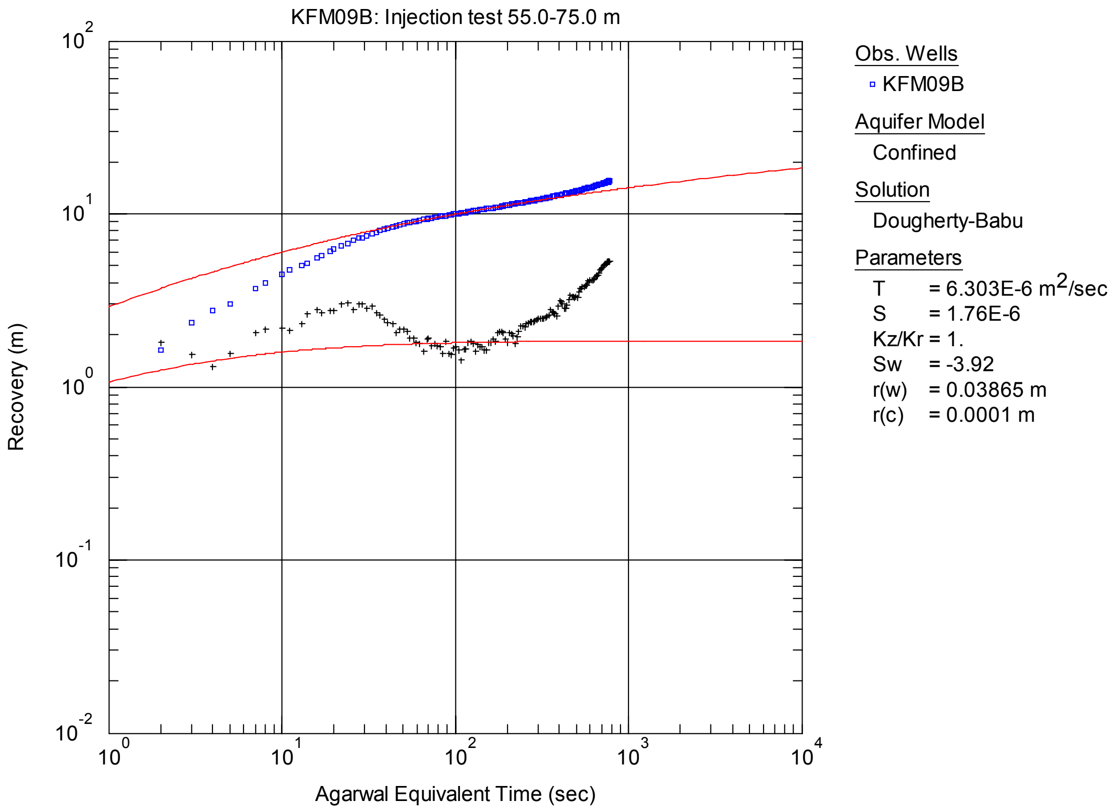


Figure A3-40. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 55.0-75.0 m in KFM09B.*

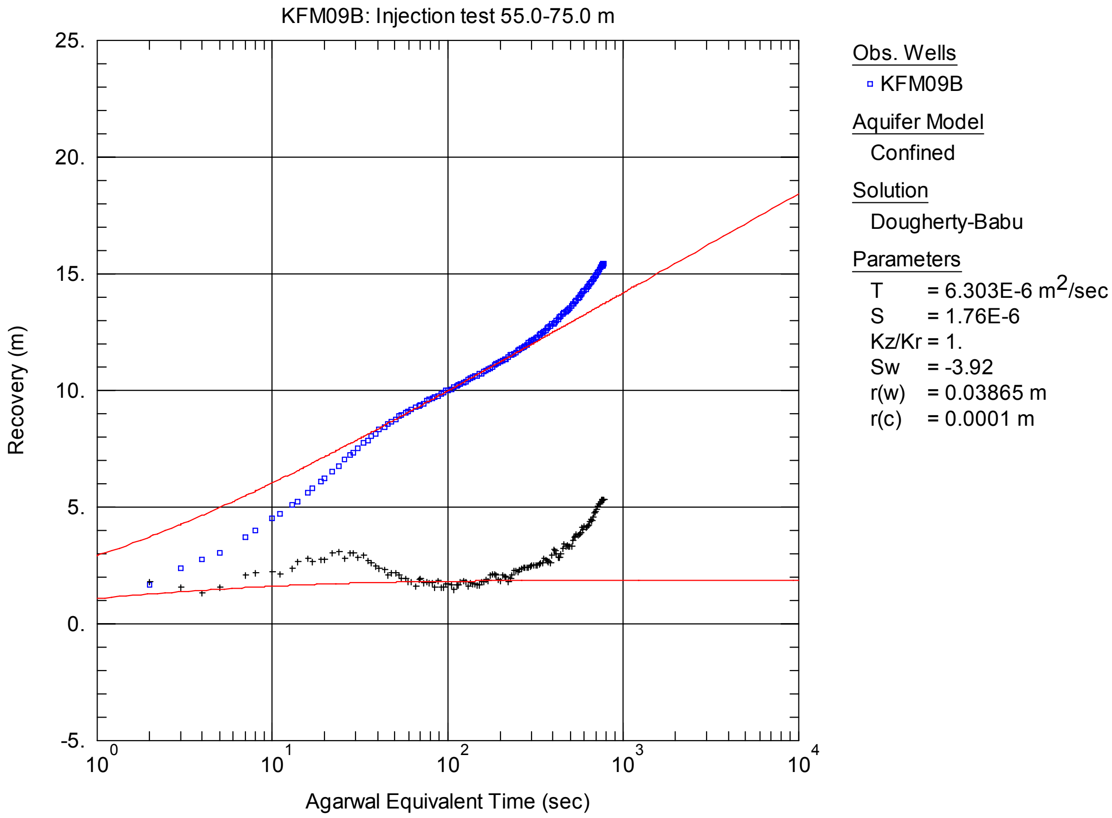


Figure A3-41. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 55.0-75.0 m in KFM09B.*

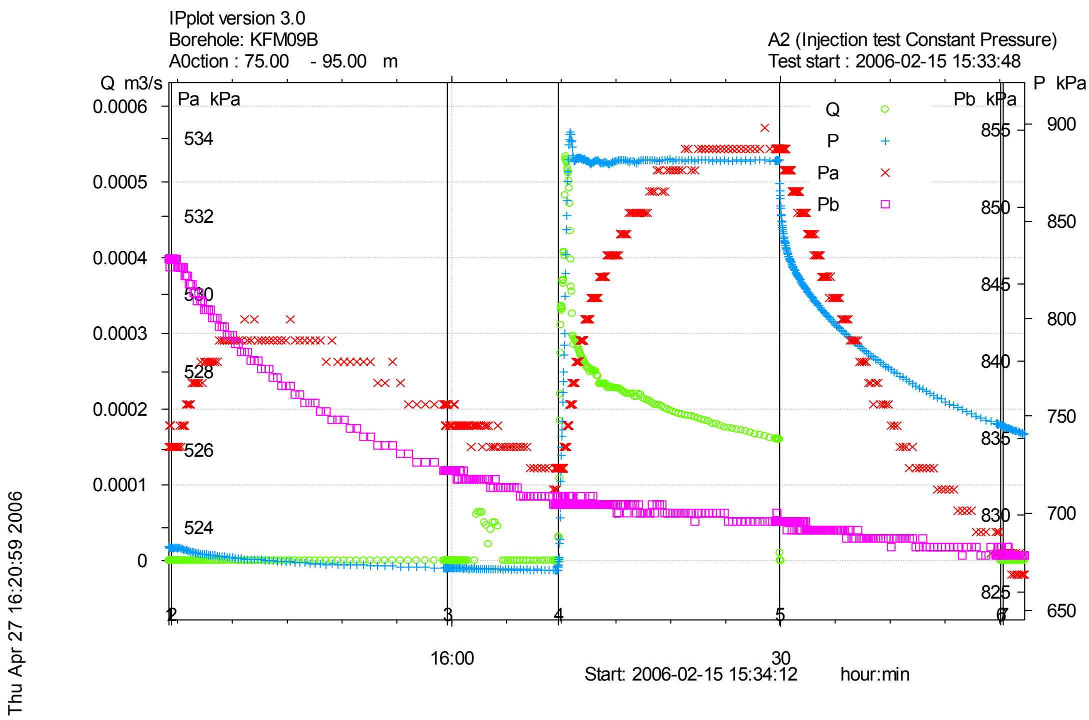


Figure A3-42. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 75.0-95.0 m in borehole KFM09B.*

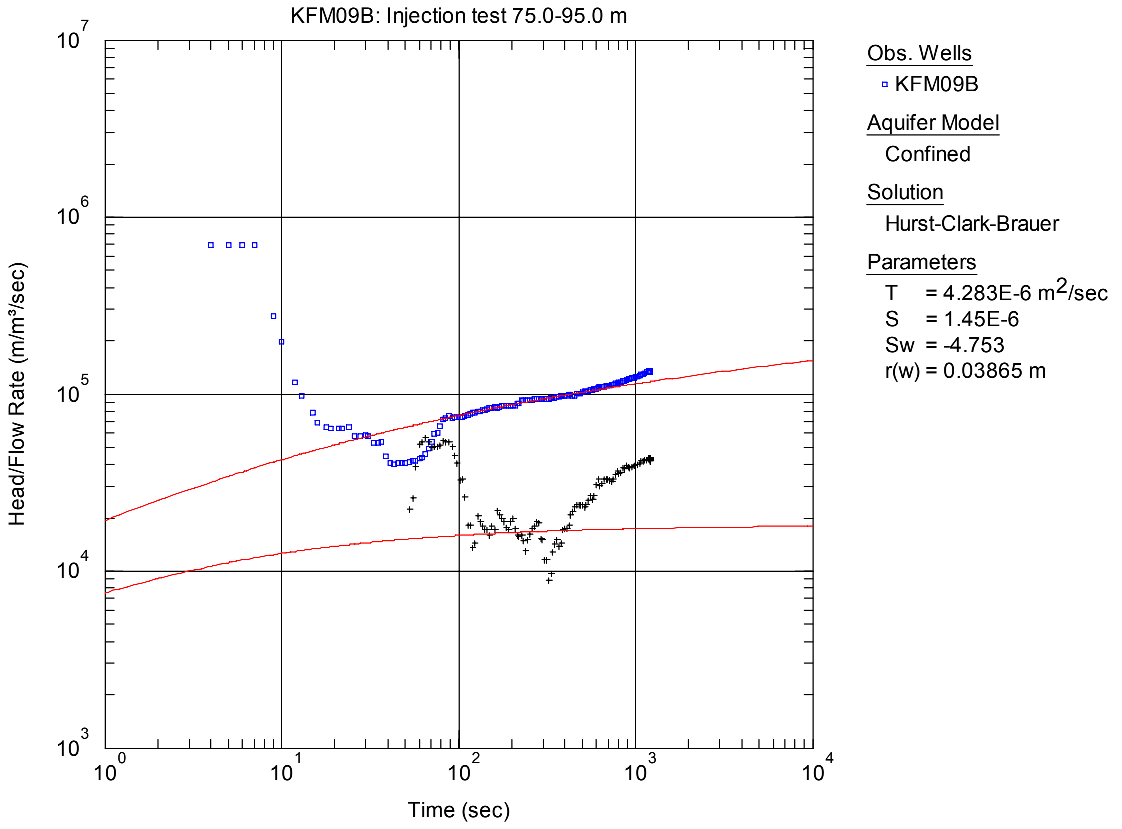


Figure A3-43. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 75.0-95.0 m in KFM09B.*

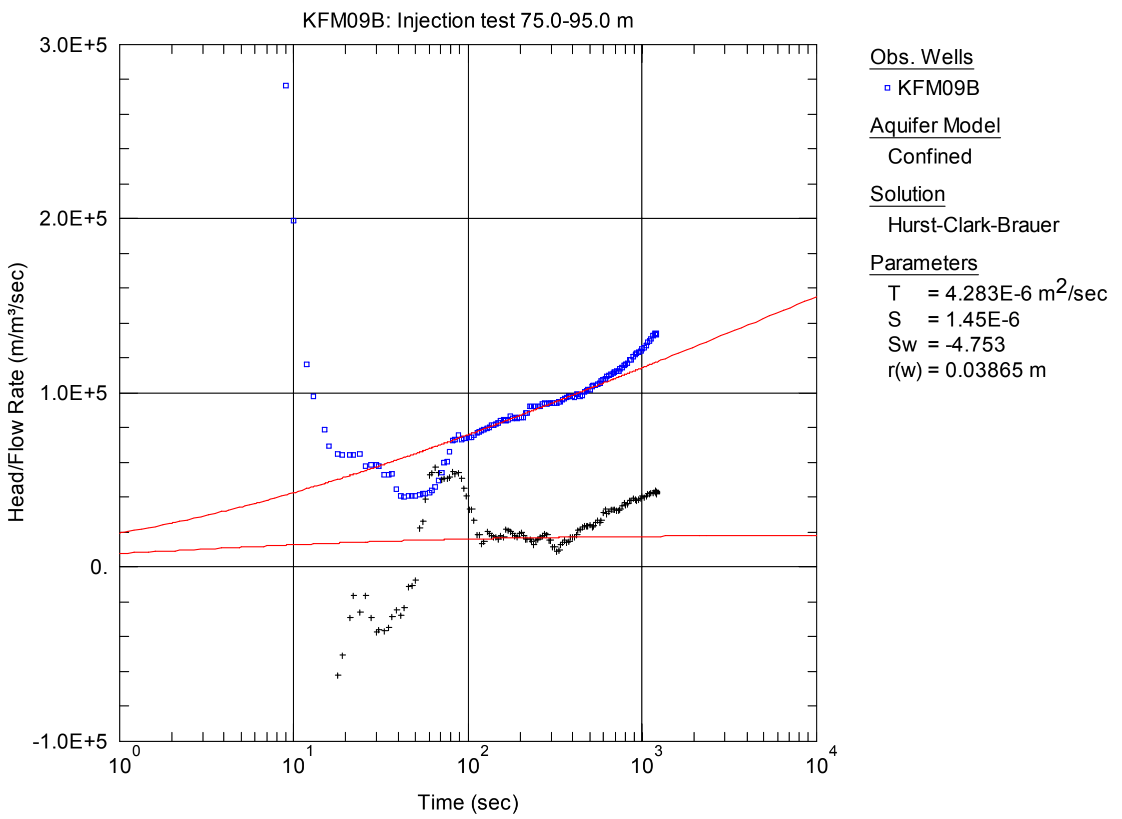


Figure A3-44. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 75.0-95.0 m in KFM09B.*

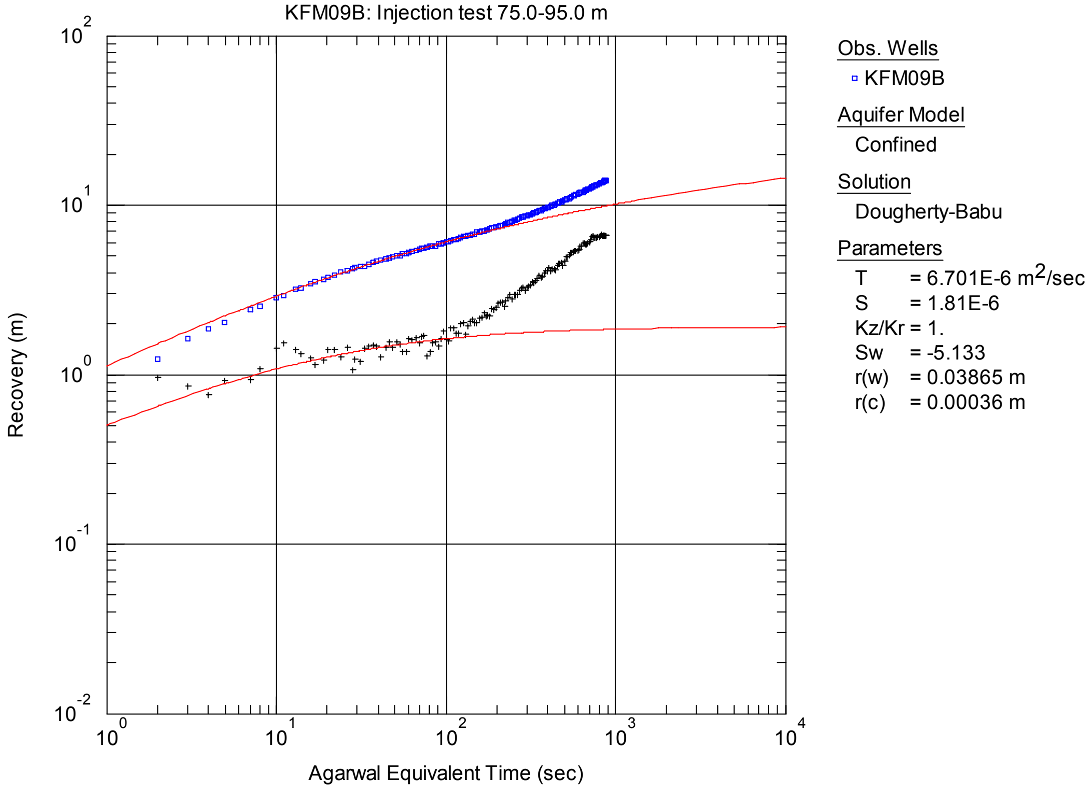


Figure A3-45. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 75.0-95.0 m in KFM09B.*

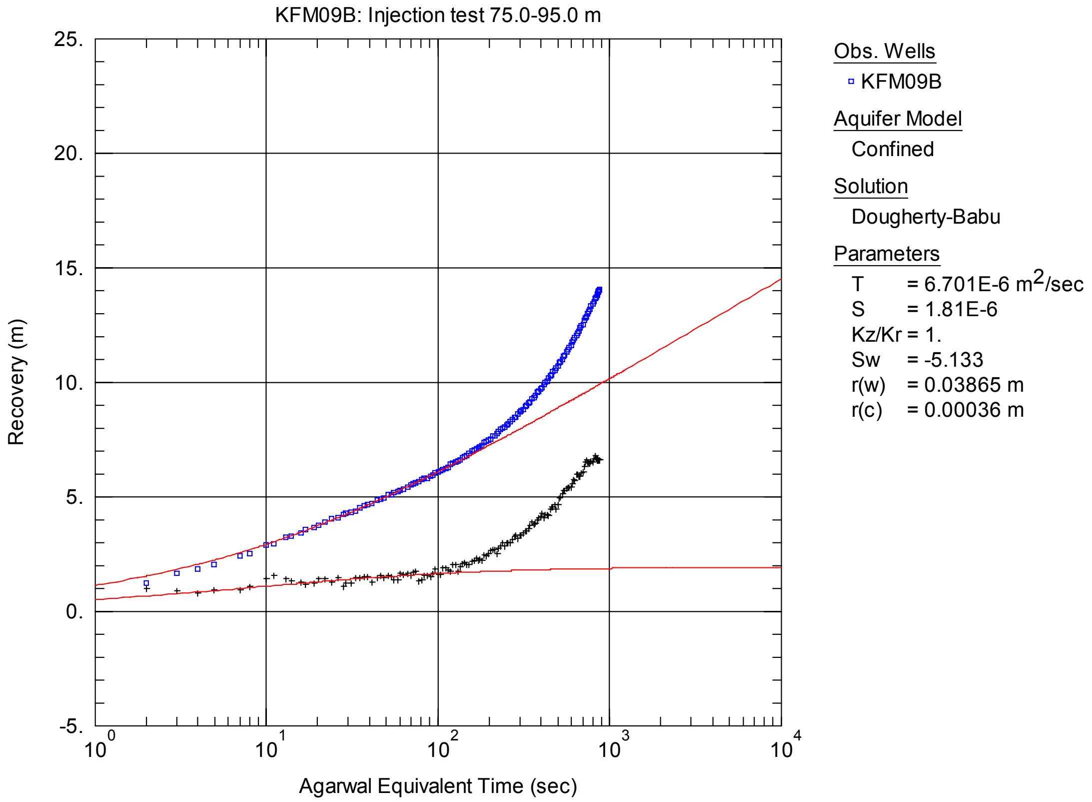


Figure A3-46. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 75.0-95.0 m in KFM09B.*

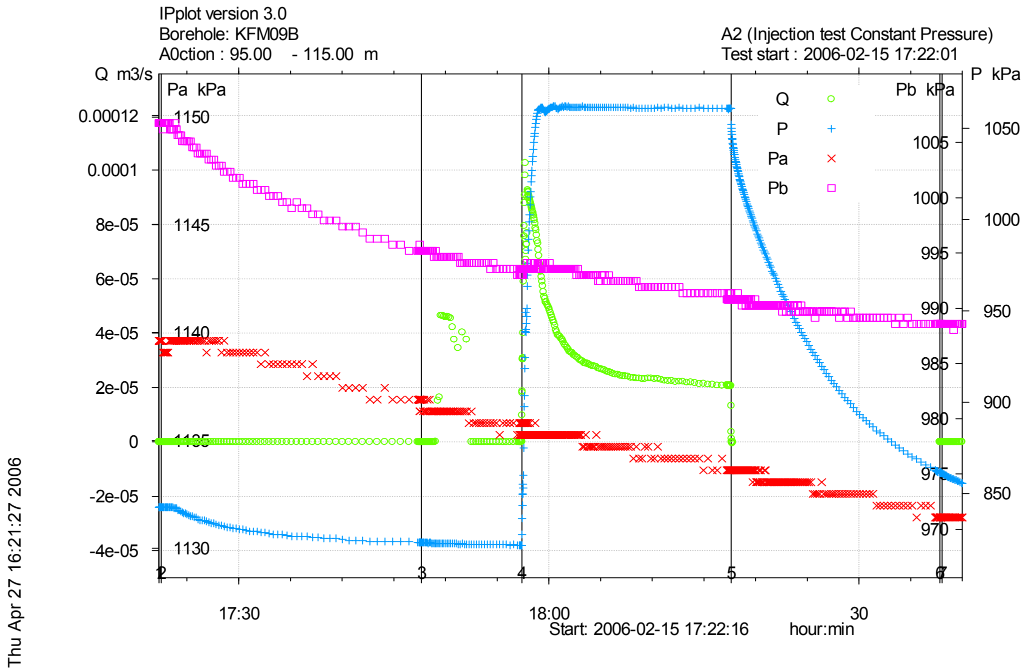


Figure A3-47. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 95.0-115.0 m in borehole KFM09B.

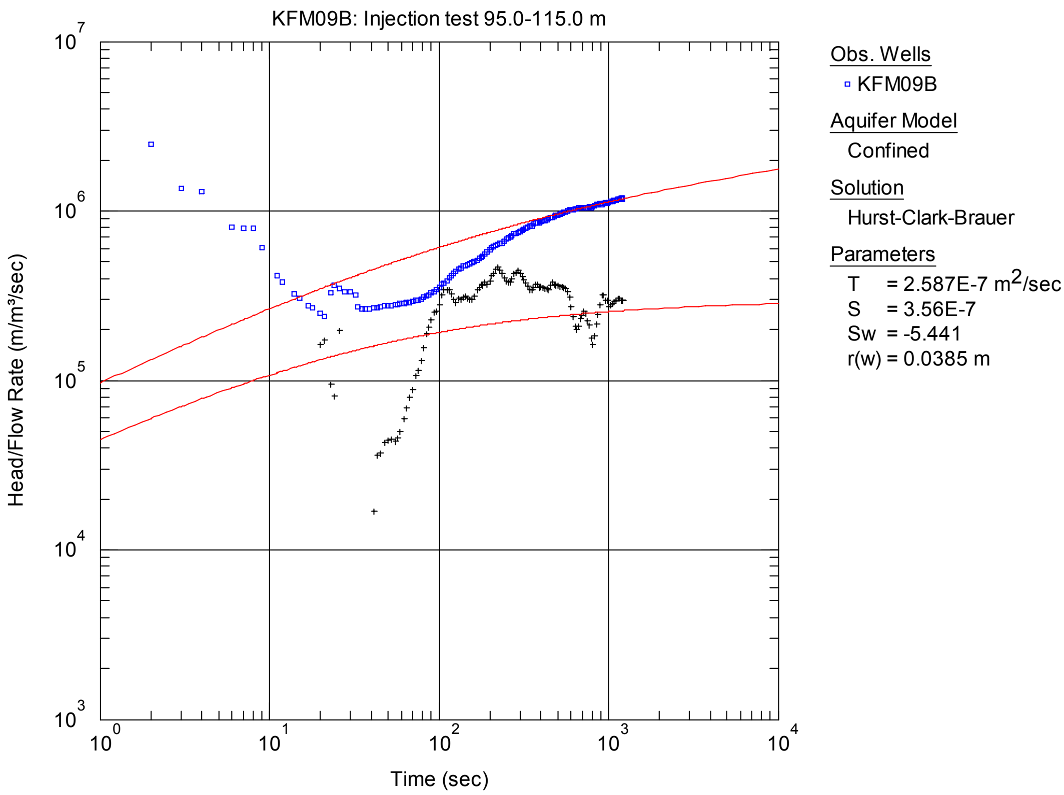


Figure A3-48. Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 95.0-115.0 m in KFM09B.

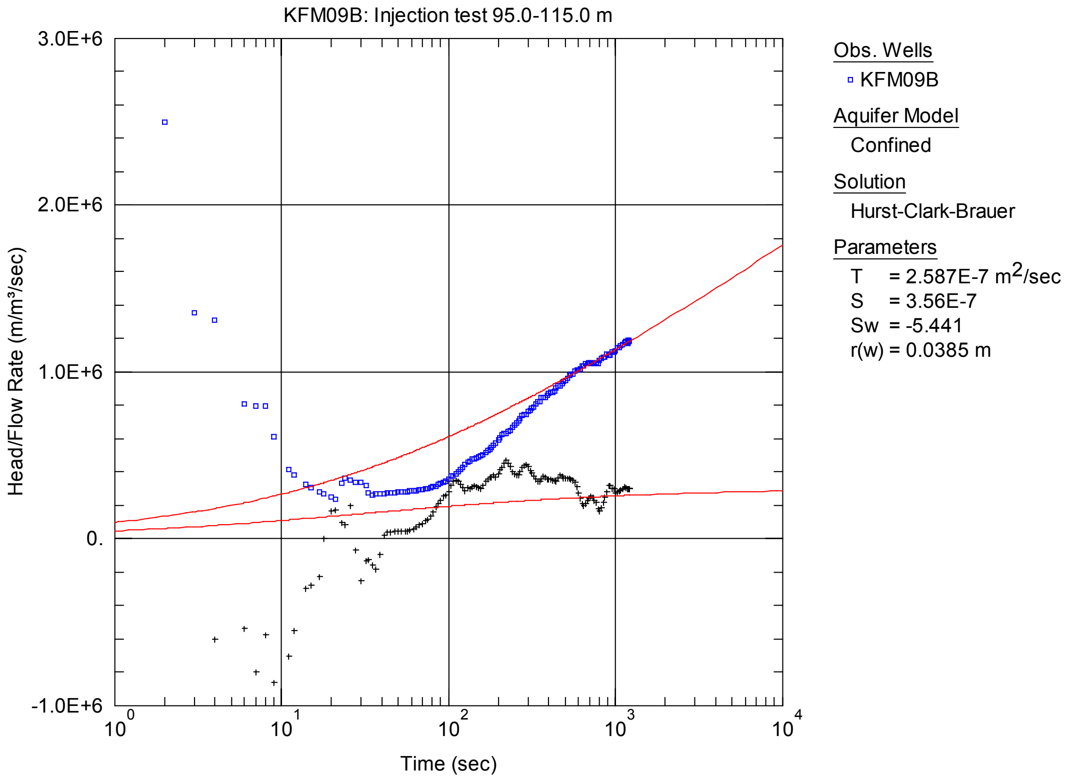


Figure A3-49. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 95.0-115.0 m in KFM09B.*

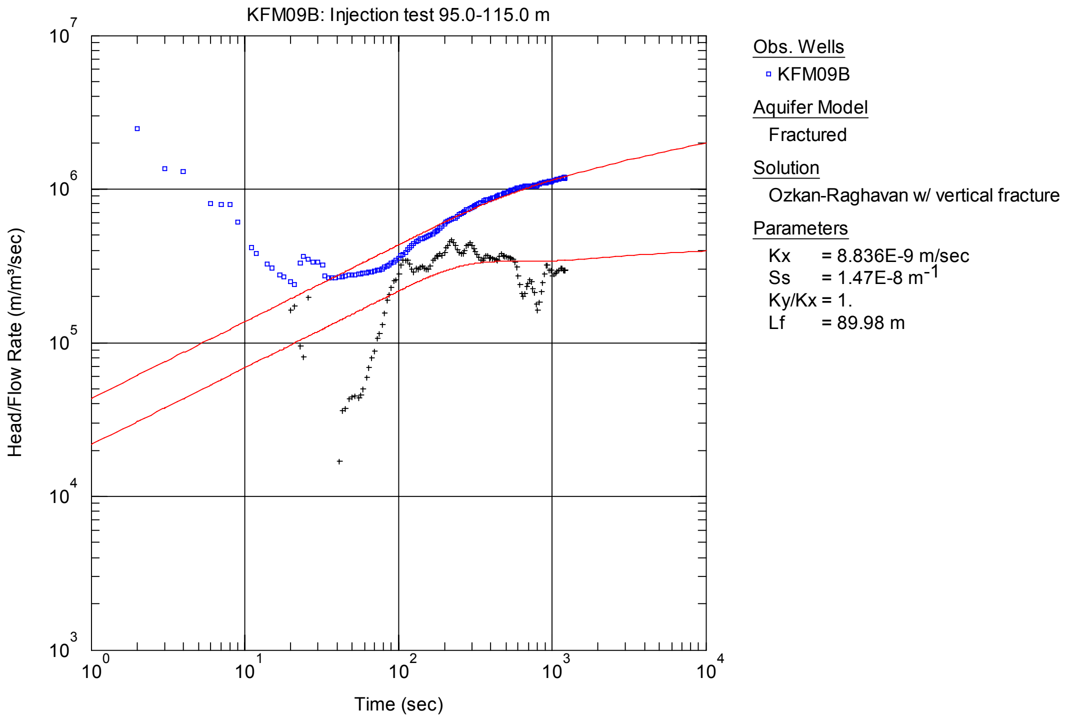


Figure A3-50. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 95.0-115.0 m in KFM09B.*

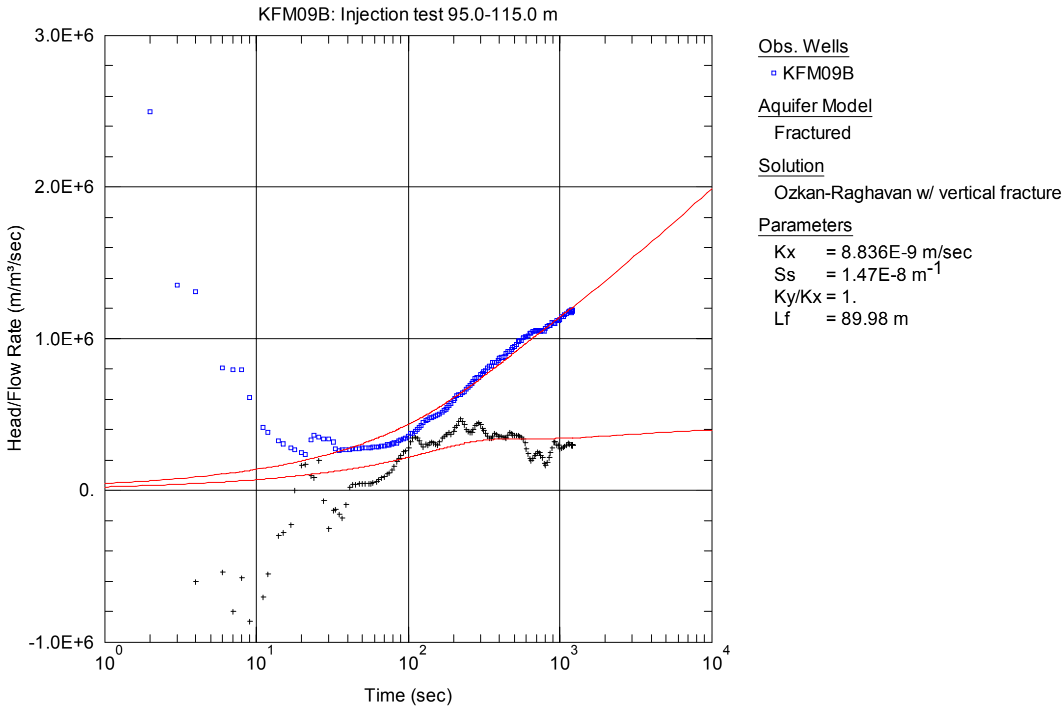


Figure A3-51. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 95.0-115.0 m in KFM09B.*

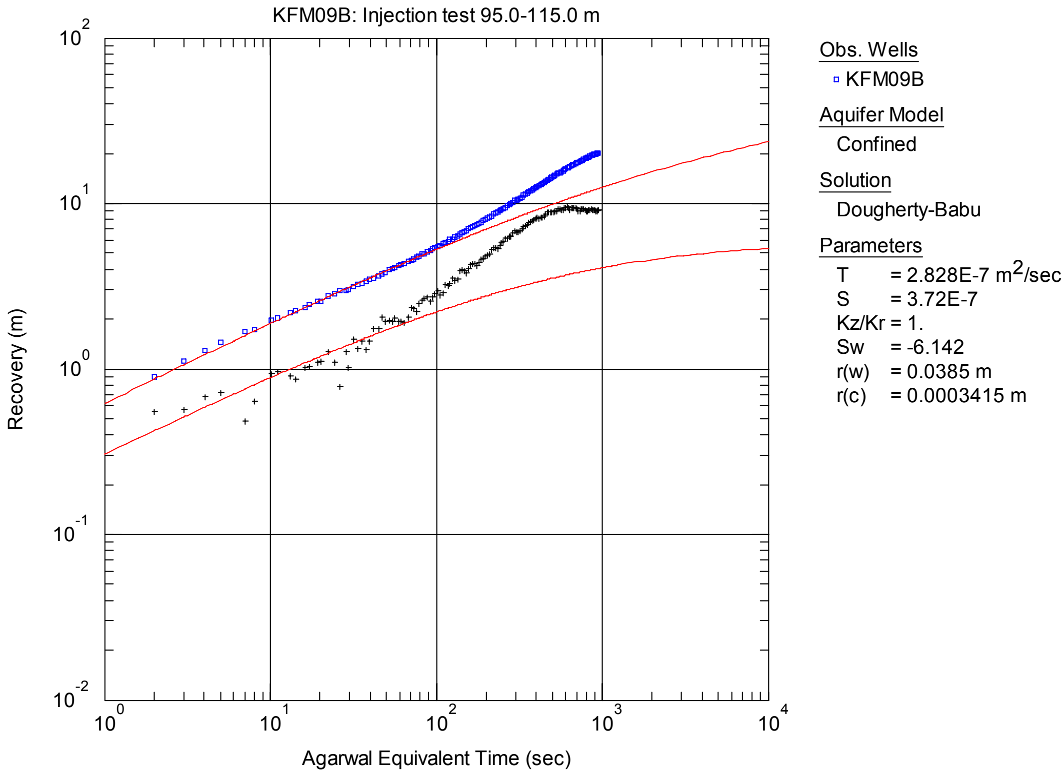


Figure A3-52. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 95.0-115.0 m in KFM09B.*

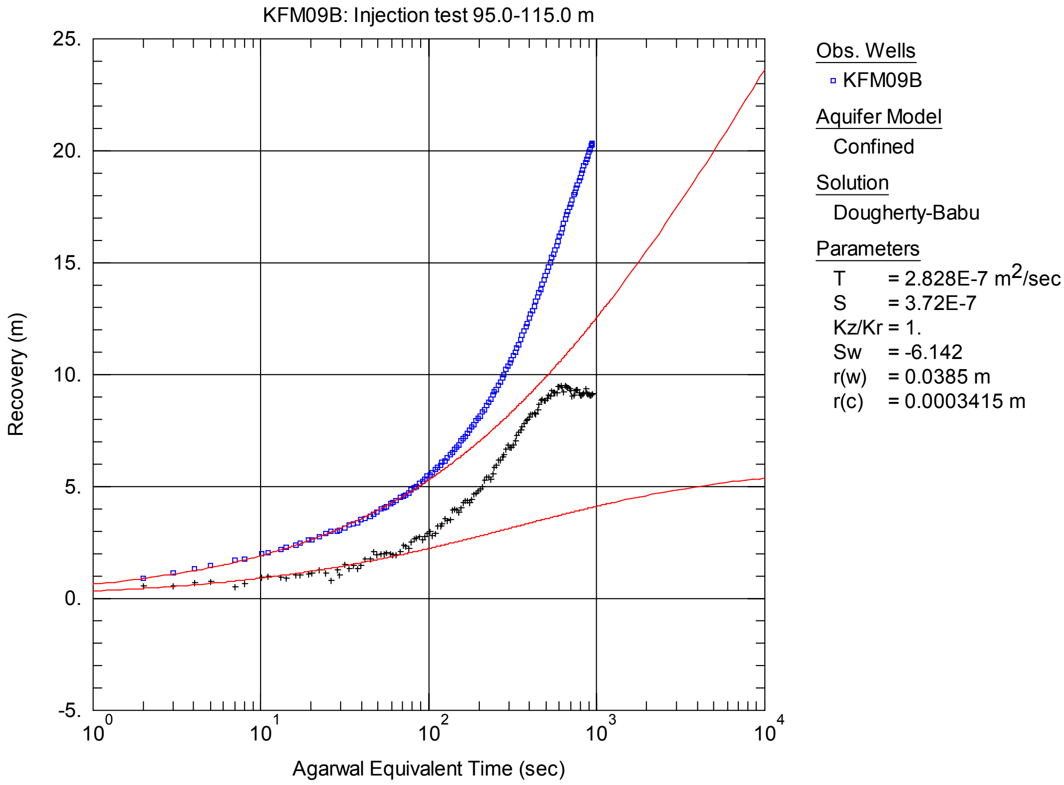


Figure A3-53. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 95.0-115.0 m in KFM09B.*

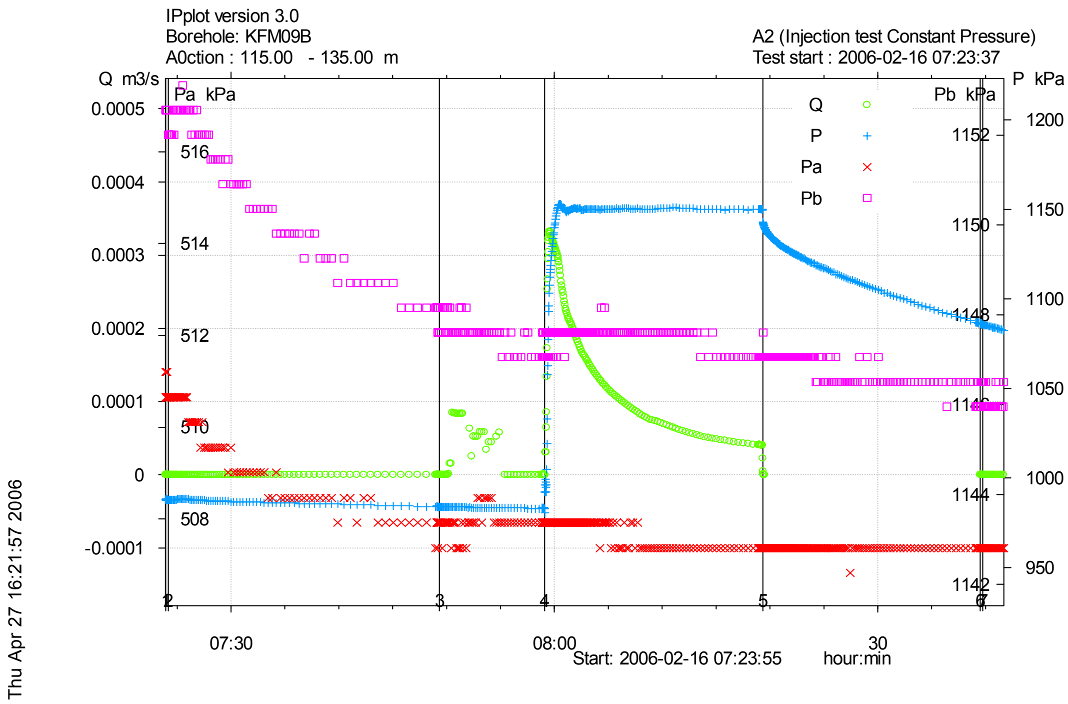


Figure A3-54. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 115.0-135.0 m in borehole KFM09B.*

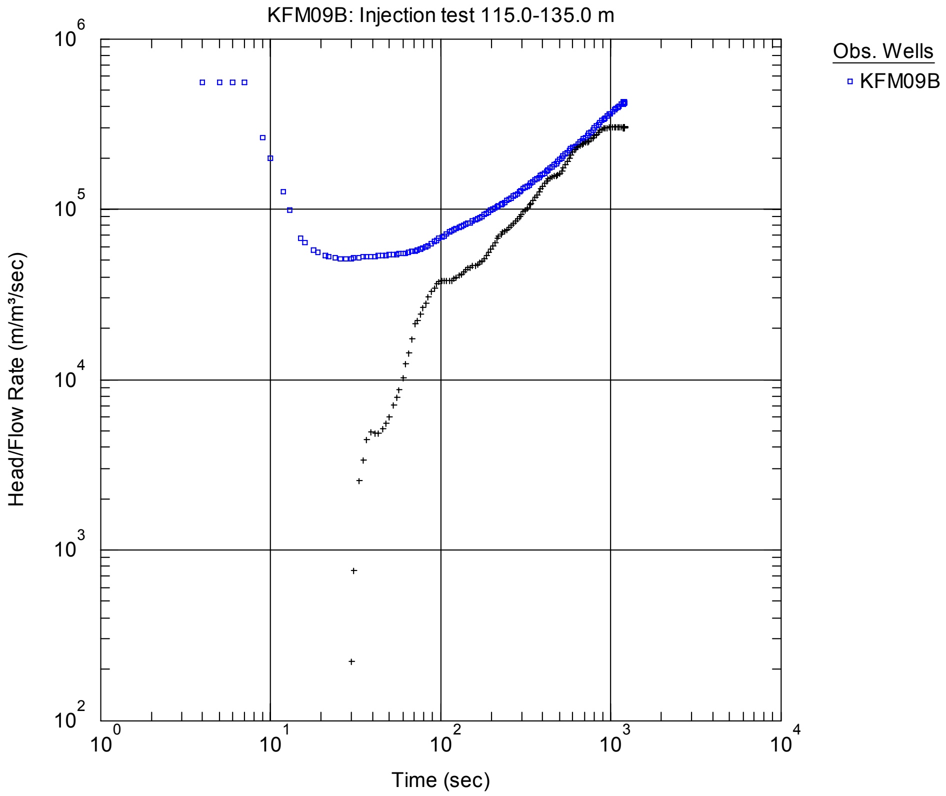


Figure A3-55. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 115.0-135.0 m in KFM09B.*

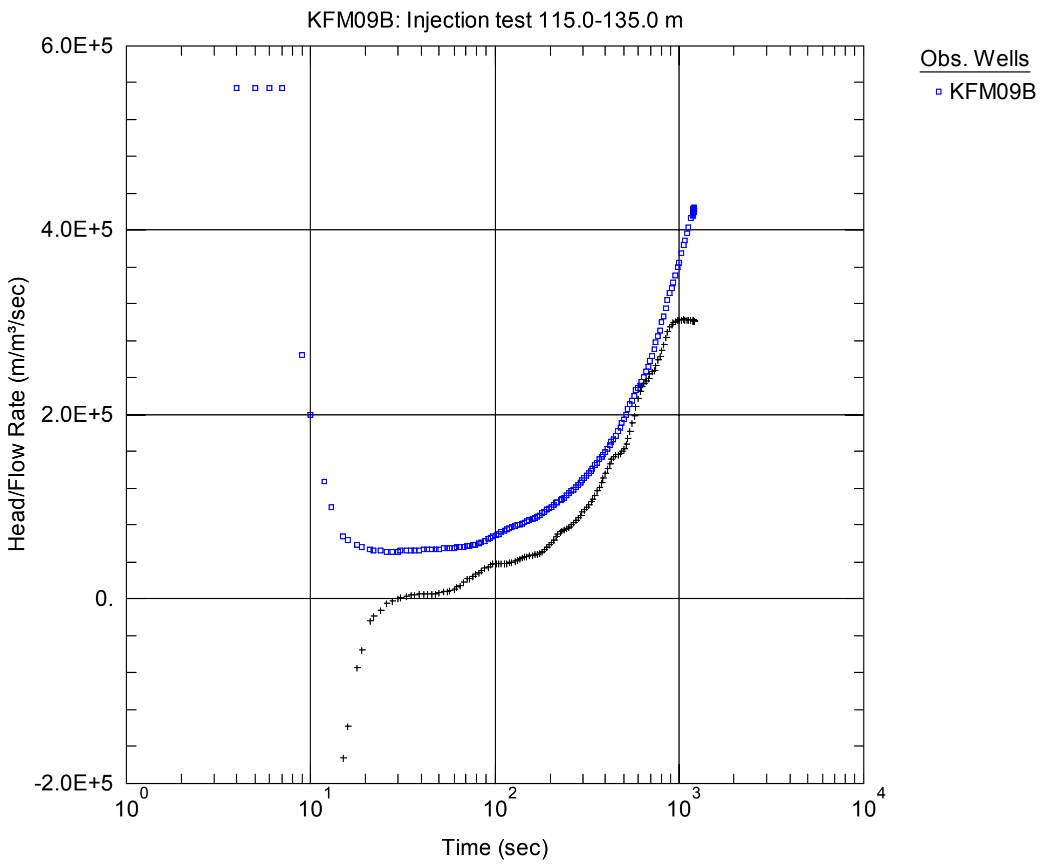


Figure A3-56. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 115.0-135.0 m in KFM09B.*

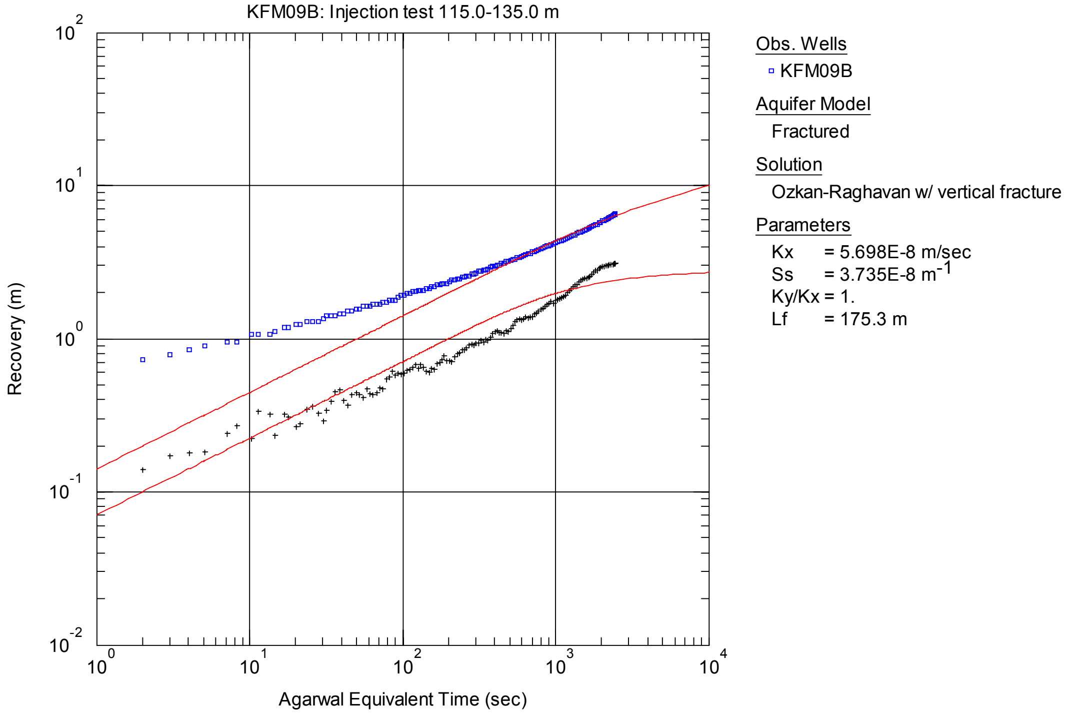


Figure A3-57. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 115.0-135.0 m in KFM09B. No unambiguous transient evaluation was possible from the recovery period. This solution is only shown for demonstrative purposes.*

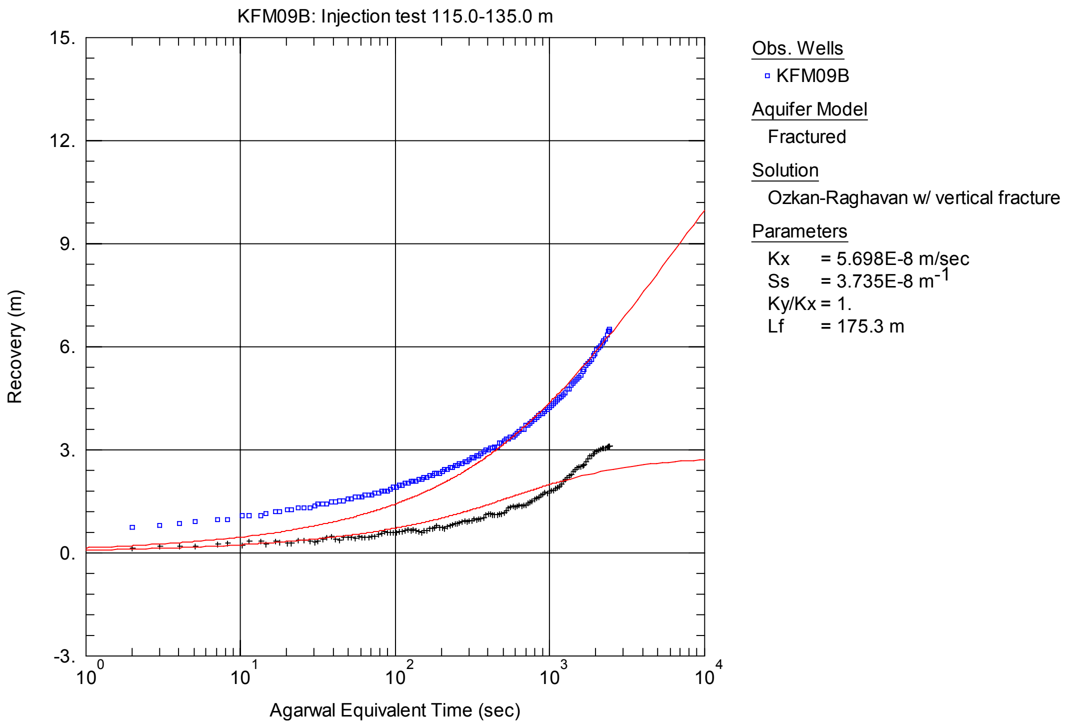


Figure A3-58. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 115.0-135.0 m in KFM09B. No unambiguous transient evaluation was possible from the recovery period. This solution is only shown for demonstrative purposes.*

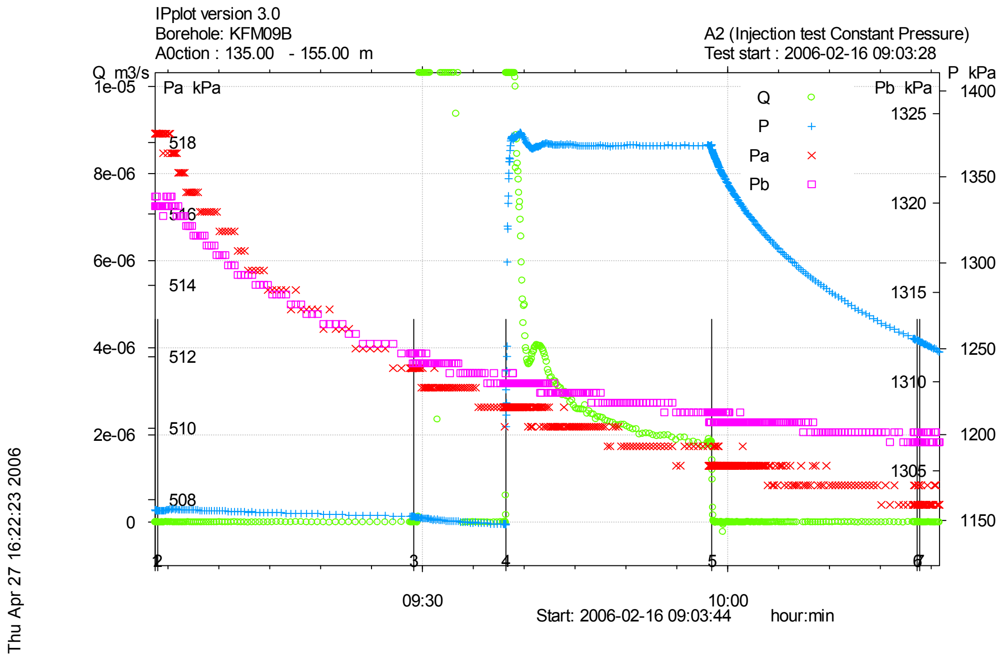


Figure A3-59. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 135.0-155.0 m in borehole KFM09B.*

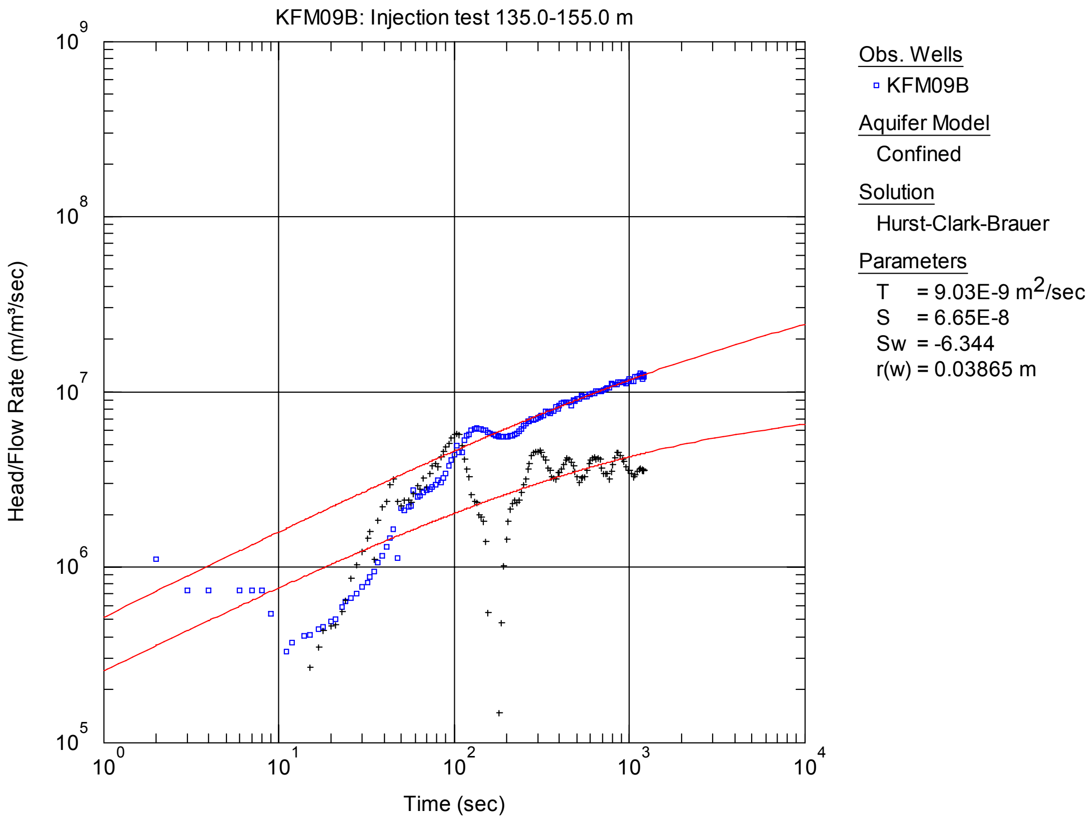


Figure A3-60. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark_Brauer solution, from the injection test in section 135.0-155.0 m in KFM09B.*

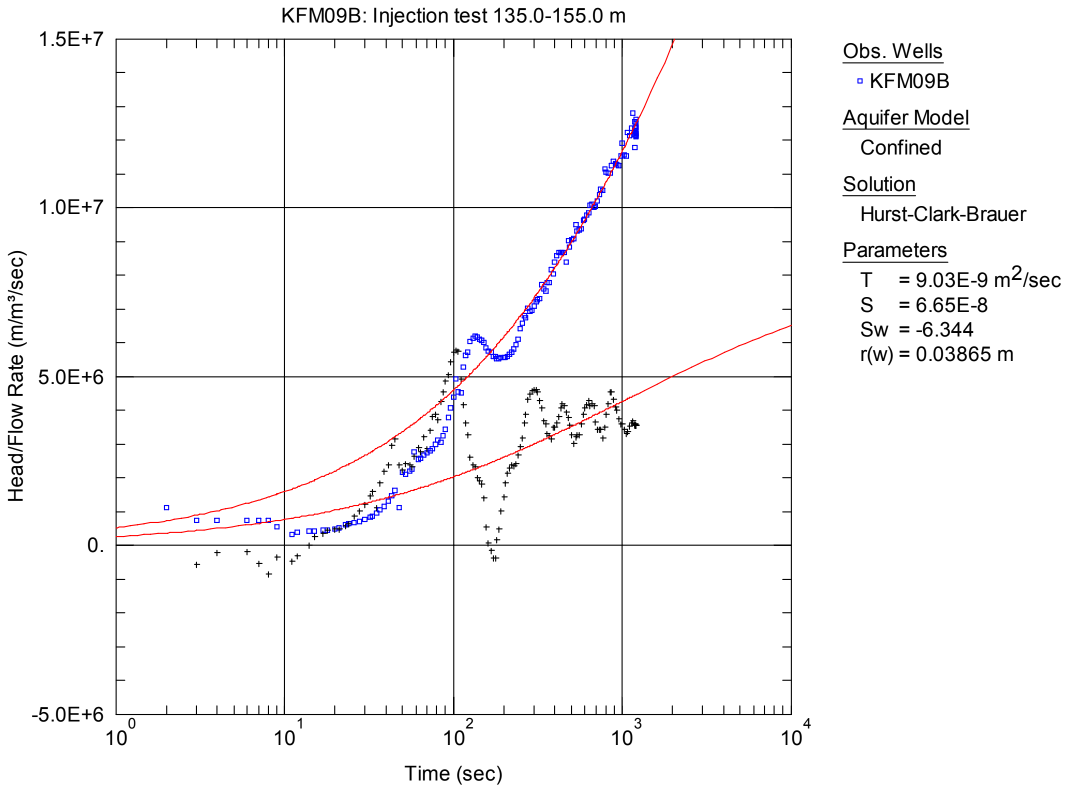


Figure A3-61. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark_Brauer solution, from the injection test in section 135.0-155.0 m in KFM09B.*

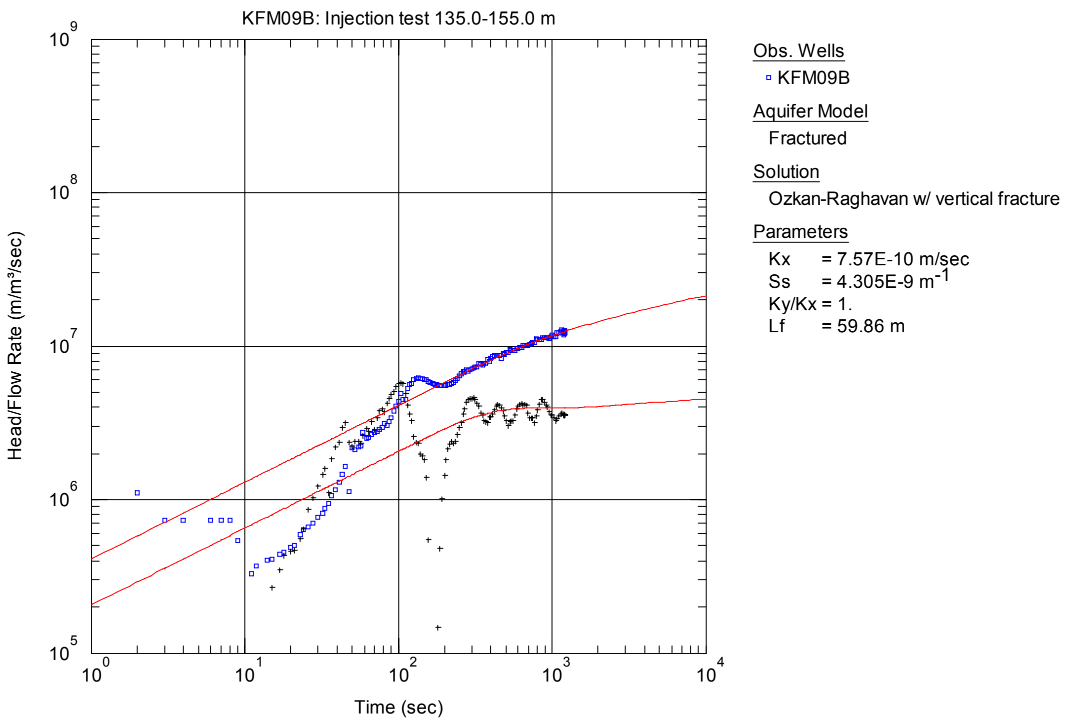


Figure A3-62. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 135.0-155.0 m in KFM09B.*

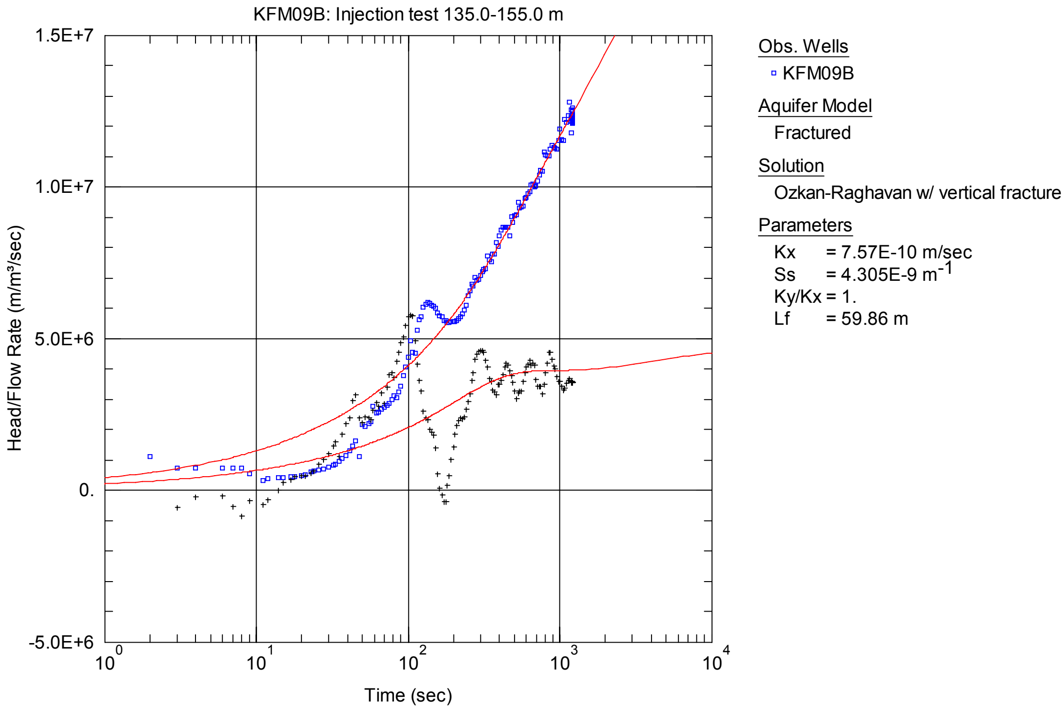


Figure A3-63. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 135.0-155.0 m in KFM09B.*

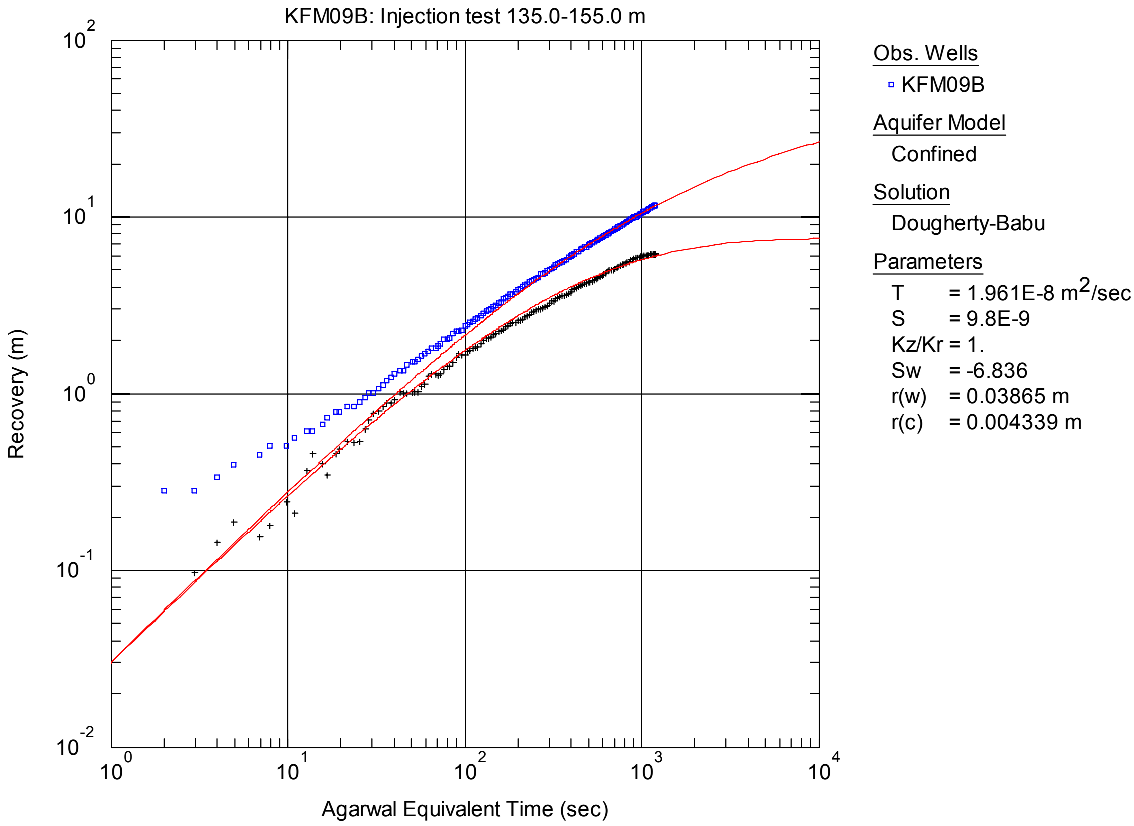


Figure A3-64. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 135.0-155.0 m in KFM09B.*

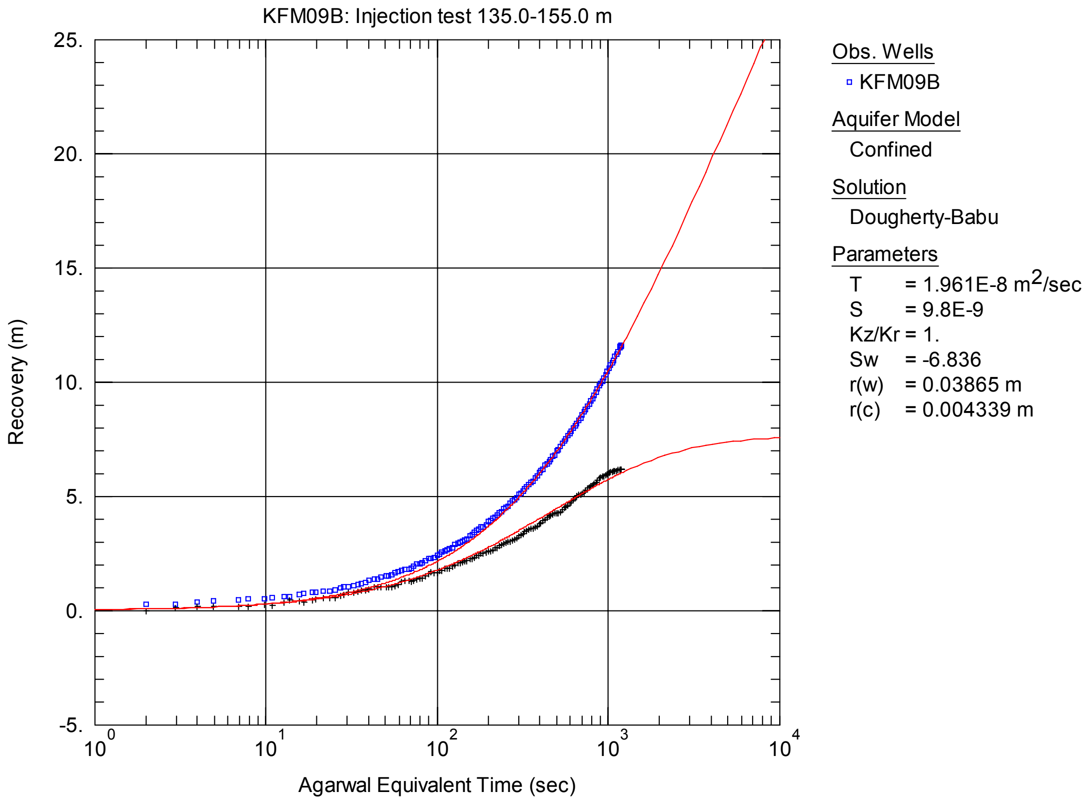


Figure A3-65. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 135.0-155.0 m in KFM09B.*

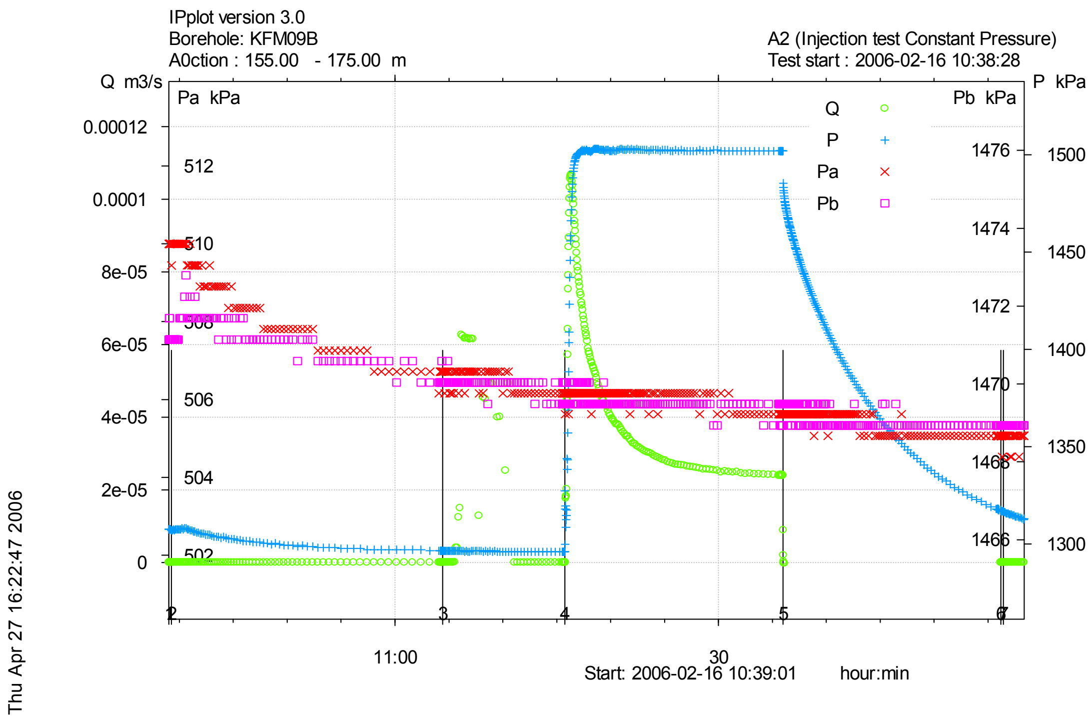


Figure A3-66. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 155.0-175.0 m in borehole KFM09B.*

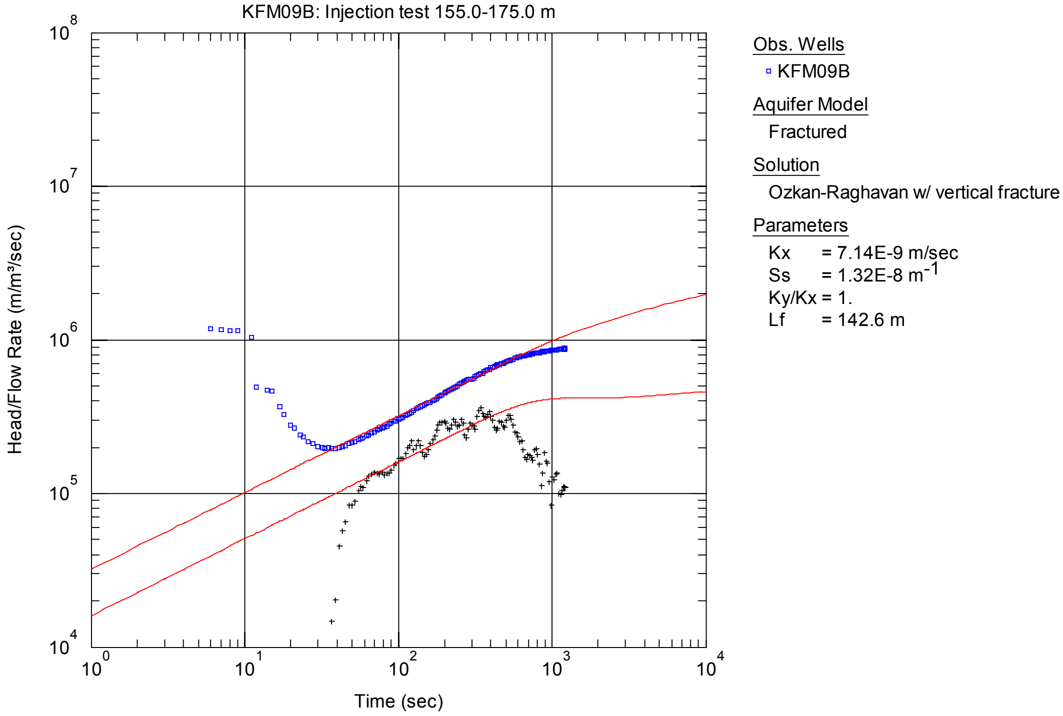


Figure A3-67. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 155.0-175.0 m in KFM09B.*

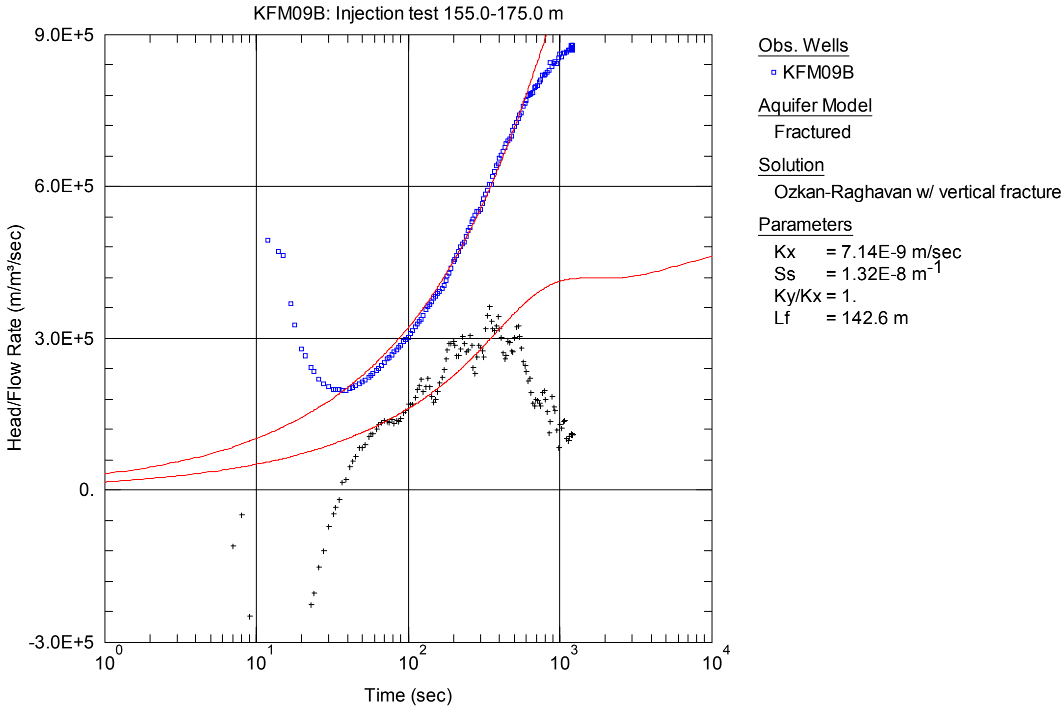


Figure A3-68. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 155.0-175.0 m in KFM09B.*

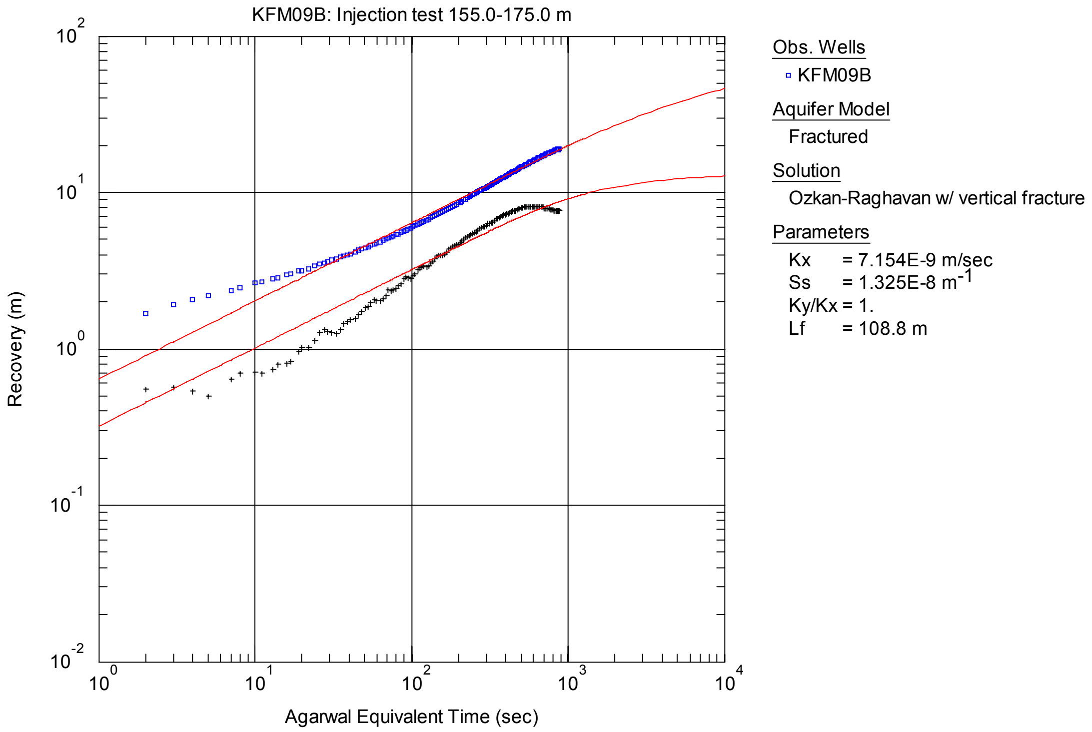


Figure A3-69. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 155.0-175.0 m in KFM09B.*

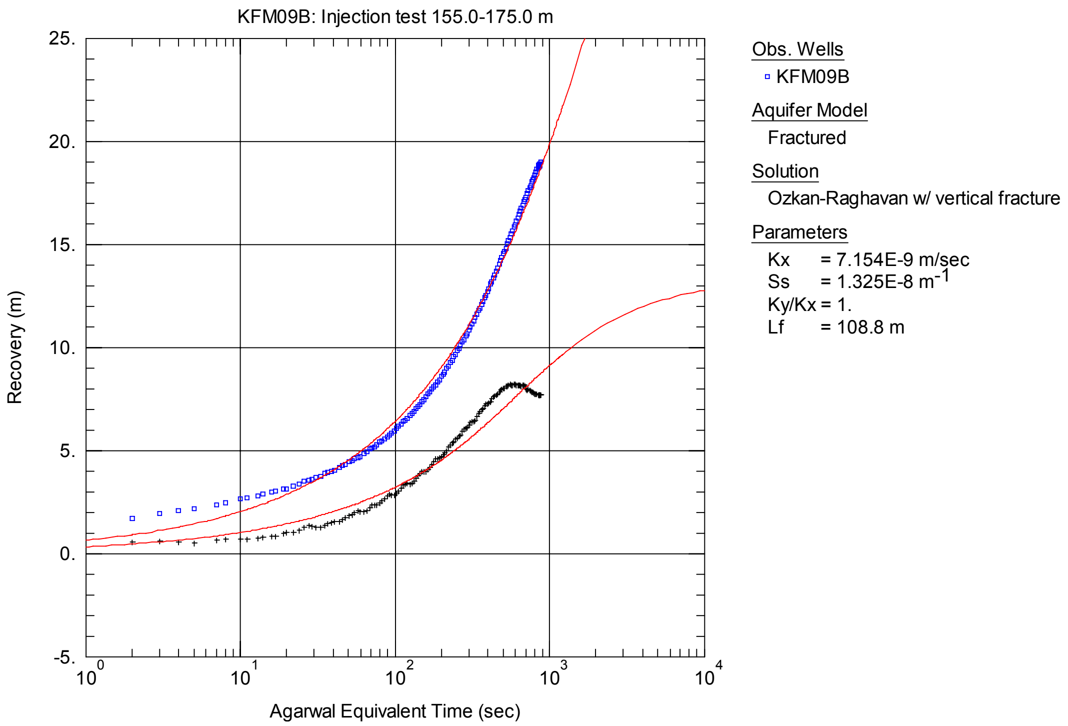


Figure A3-70. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 155.0-175.0 m in KFM09B.*

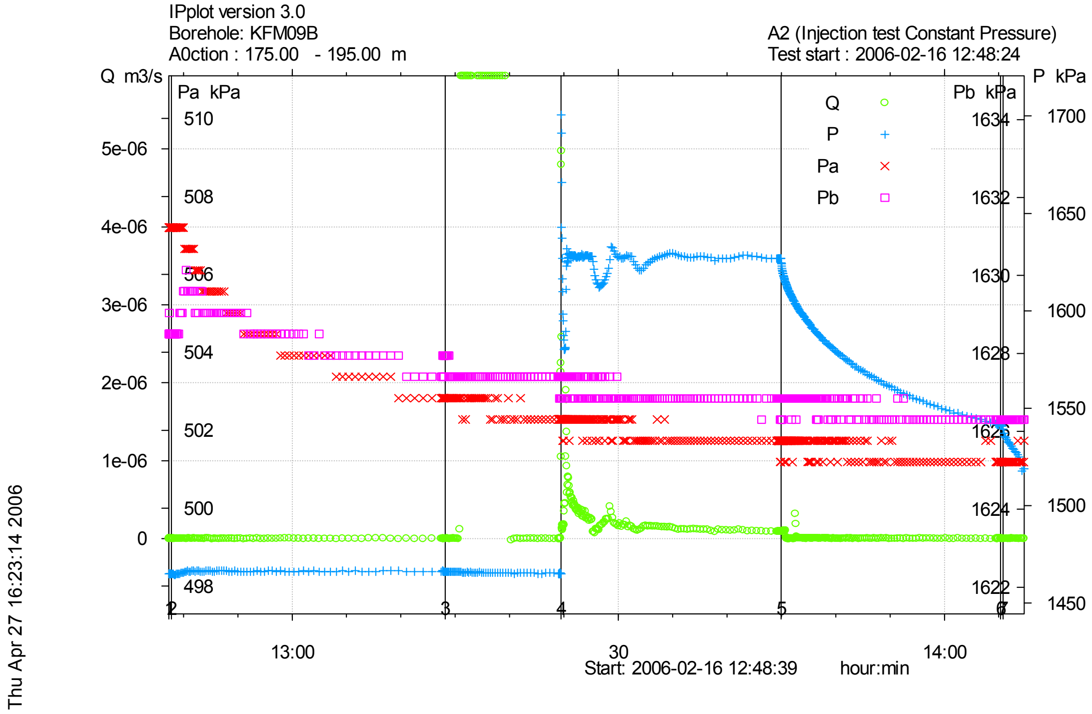


Figure A3-71. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 175.0-195.0 m in borehole KFM09B.*

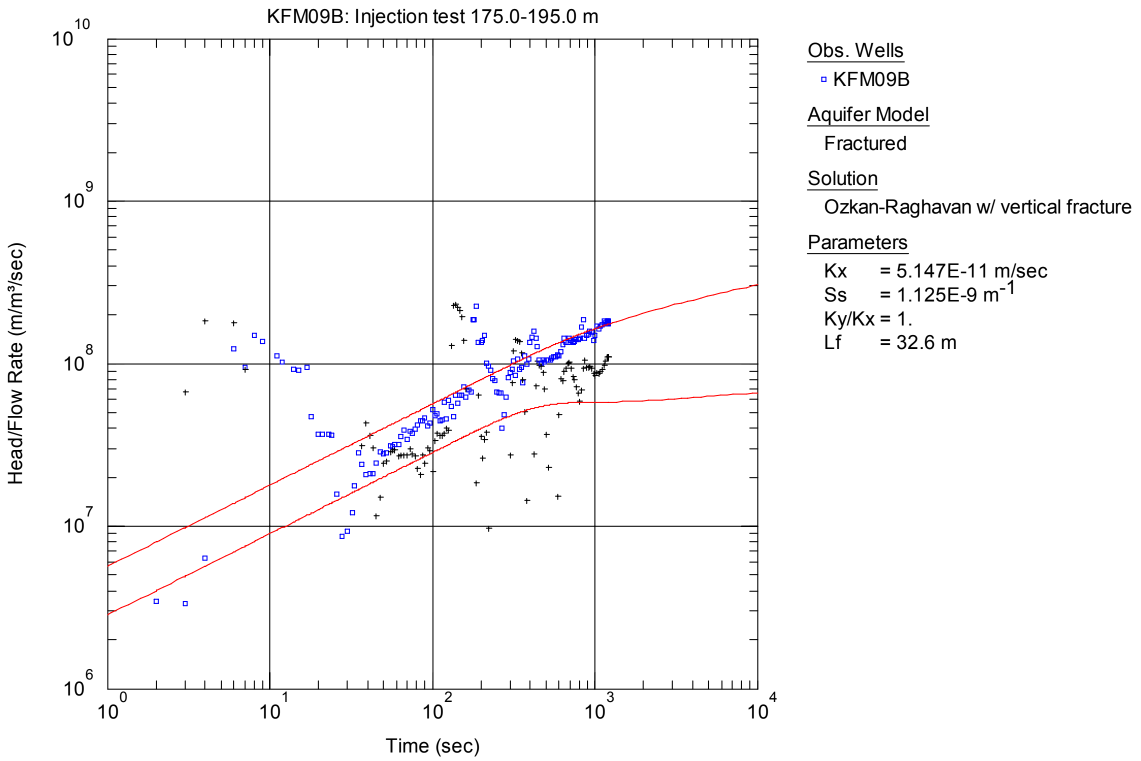


Figure A3-72. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 175.0-195.0 m in KFM09B.*

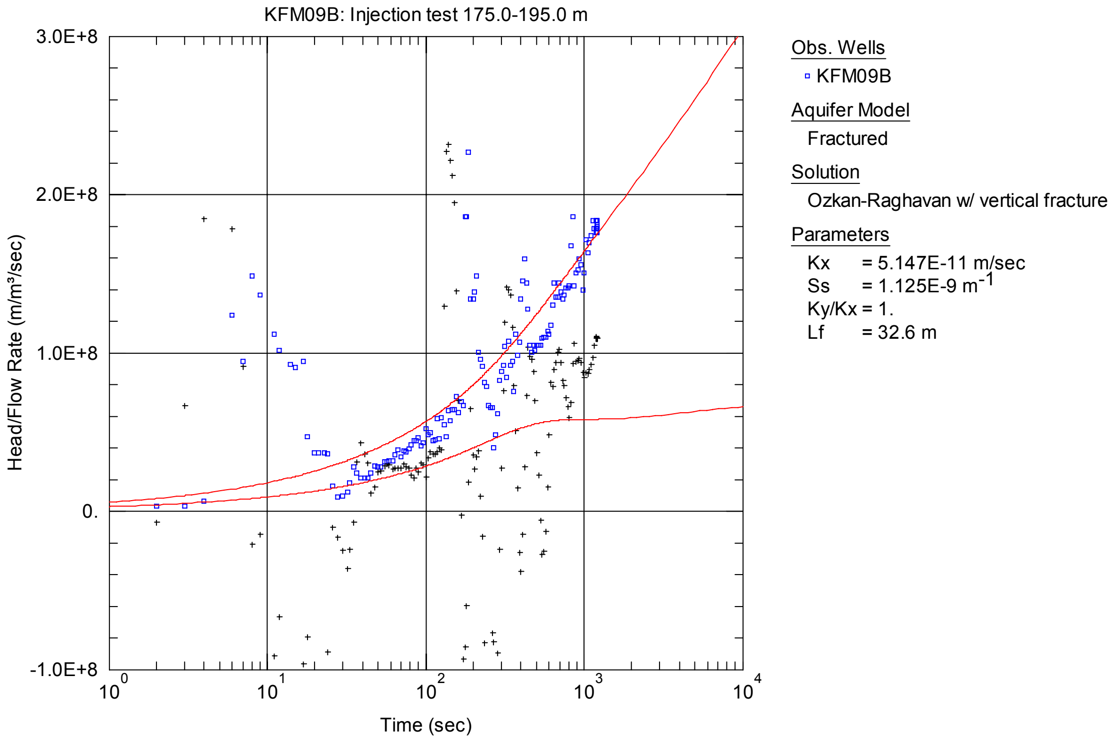


Figure A3-73. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 175.0-195.0 m in KFM09B.*

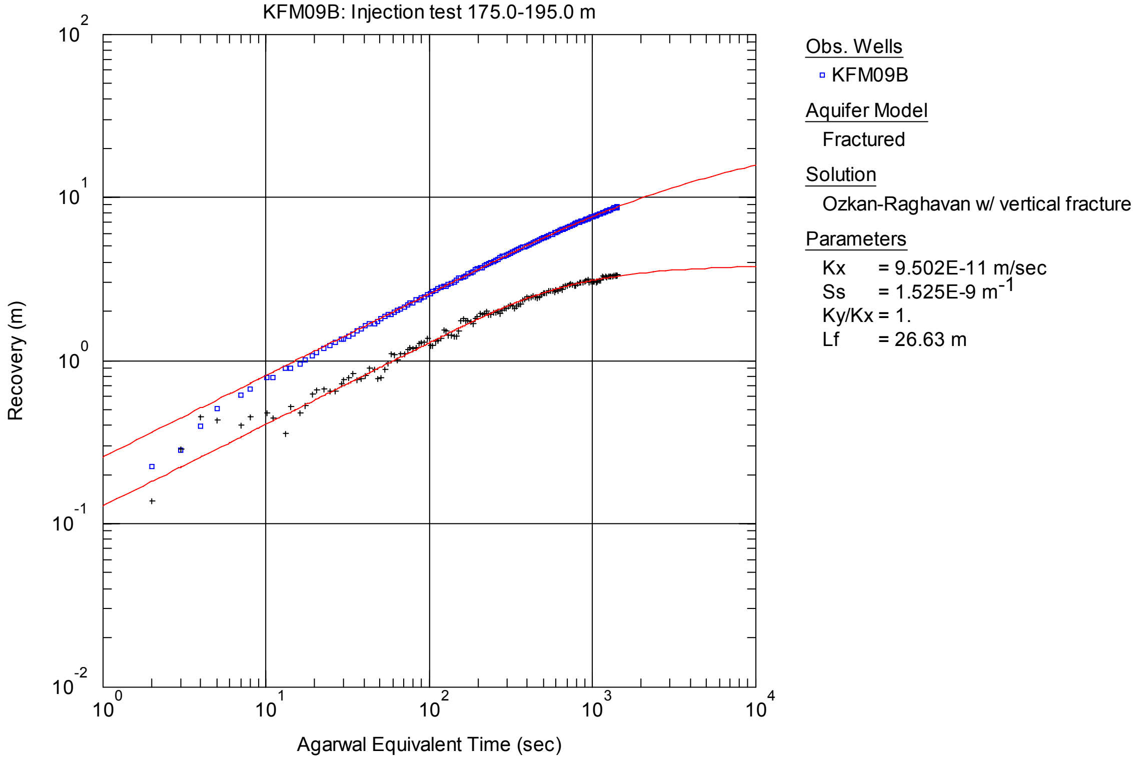


Figure A3-74. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 175.0-195.0 m in KFM09B.*

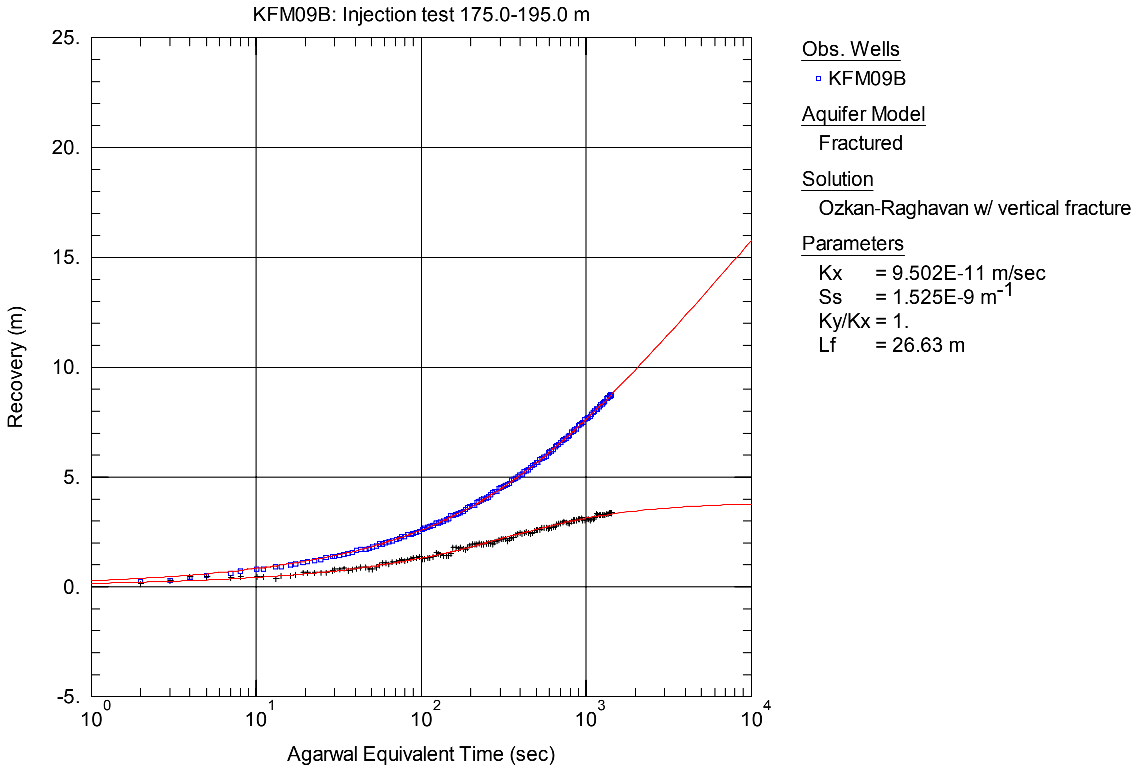


Figure A3-75. Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 175.0-195.0 m in KFM09B.

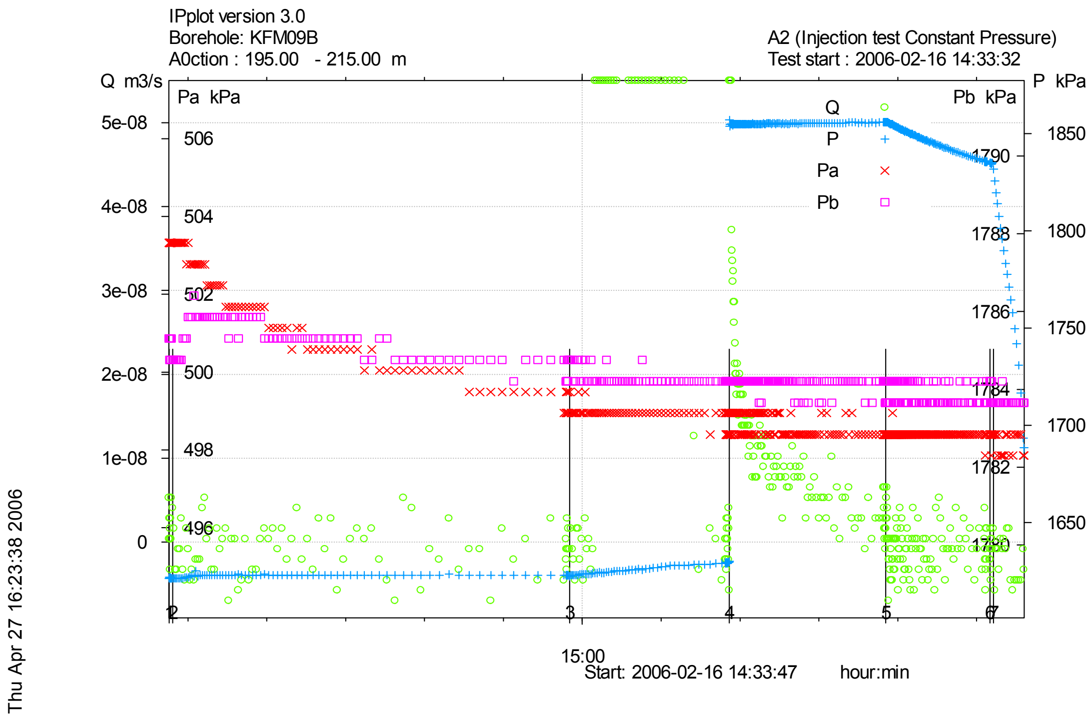


Figure A3-76. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 195.0-215.0 m in borehole KFM09B.

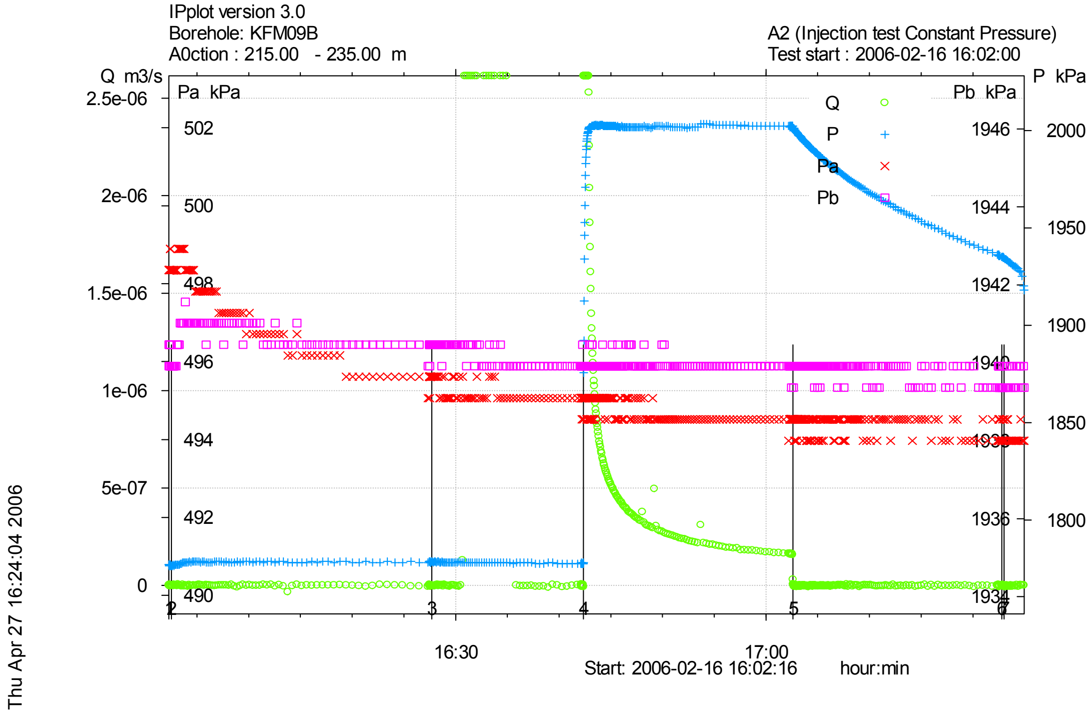


Figure A3-77. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 215.0-235.0 m in borehole KFM09B.*

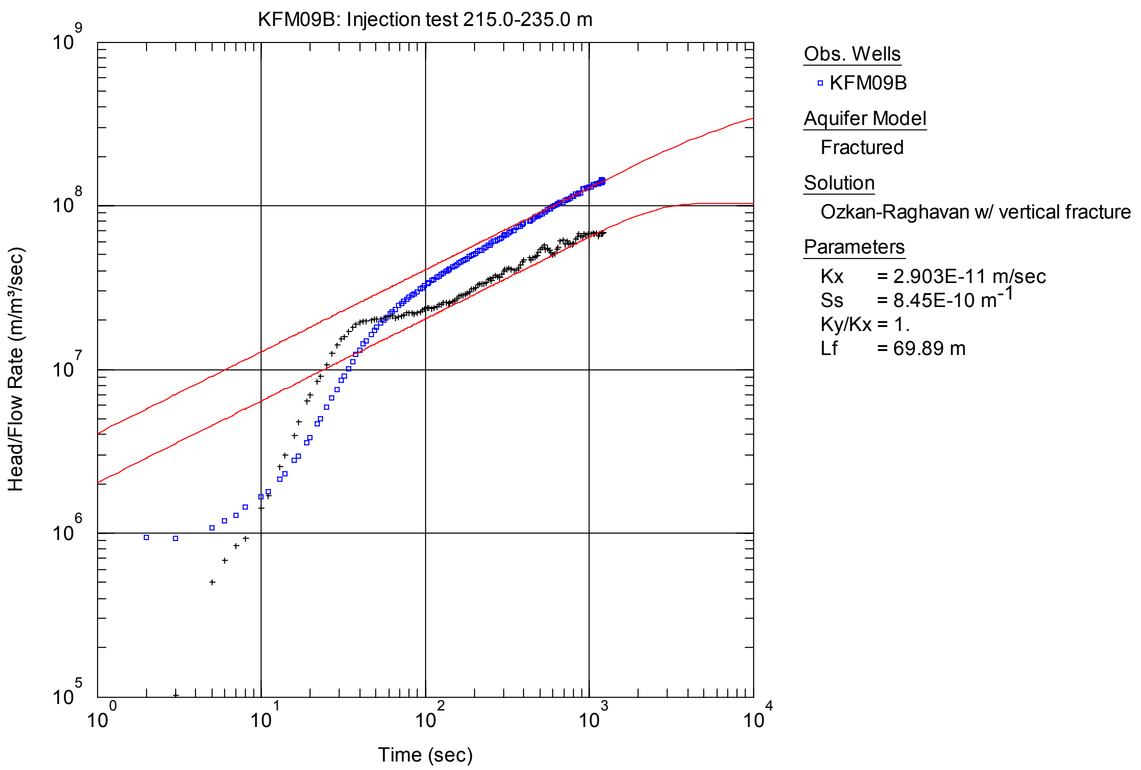


Figure A3-78. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 215.0-235.0 m in KFM09B.*

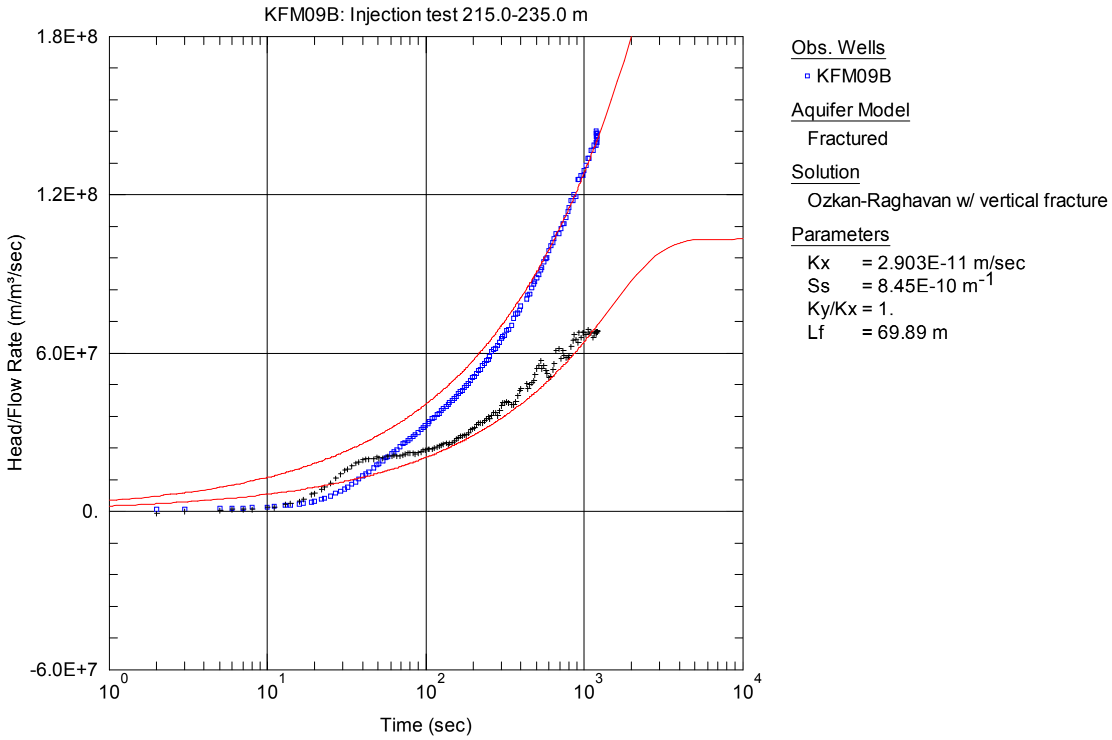


Figure A3-79. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 215.0-235.0 m in KFM09B.*

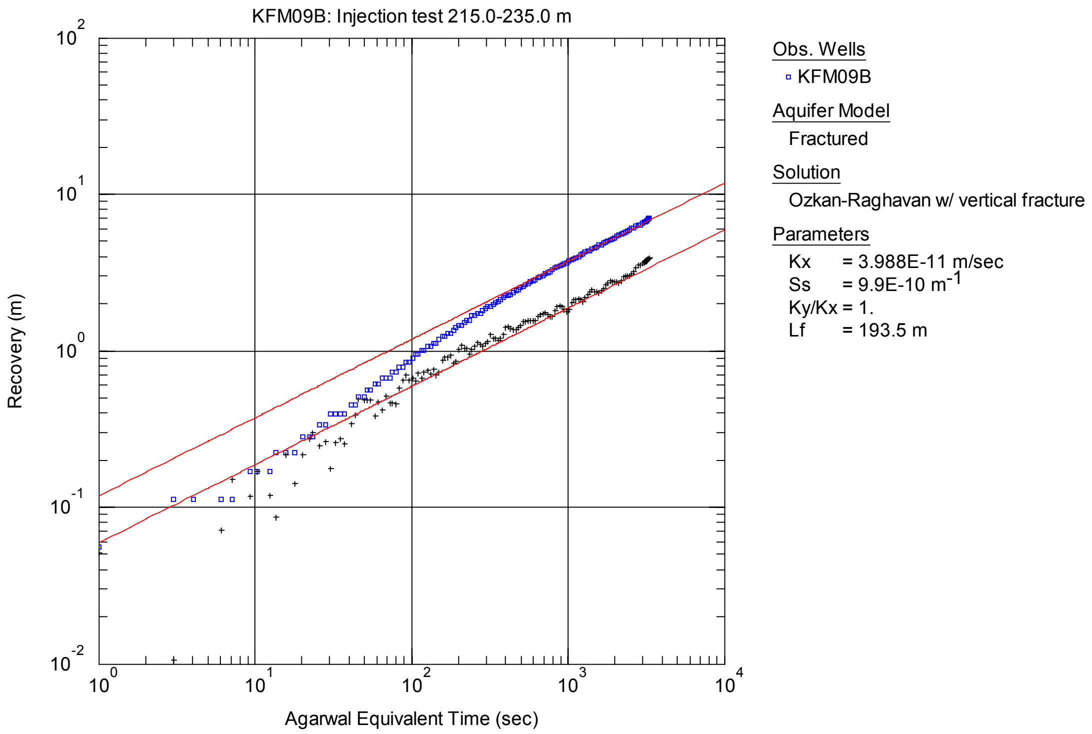


Figure A3-80. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 215.0-235.0 m in KFM09B.*

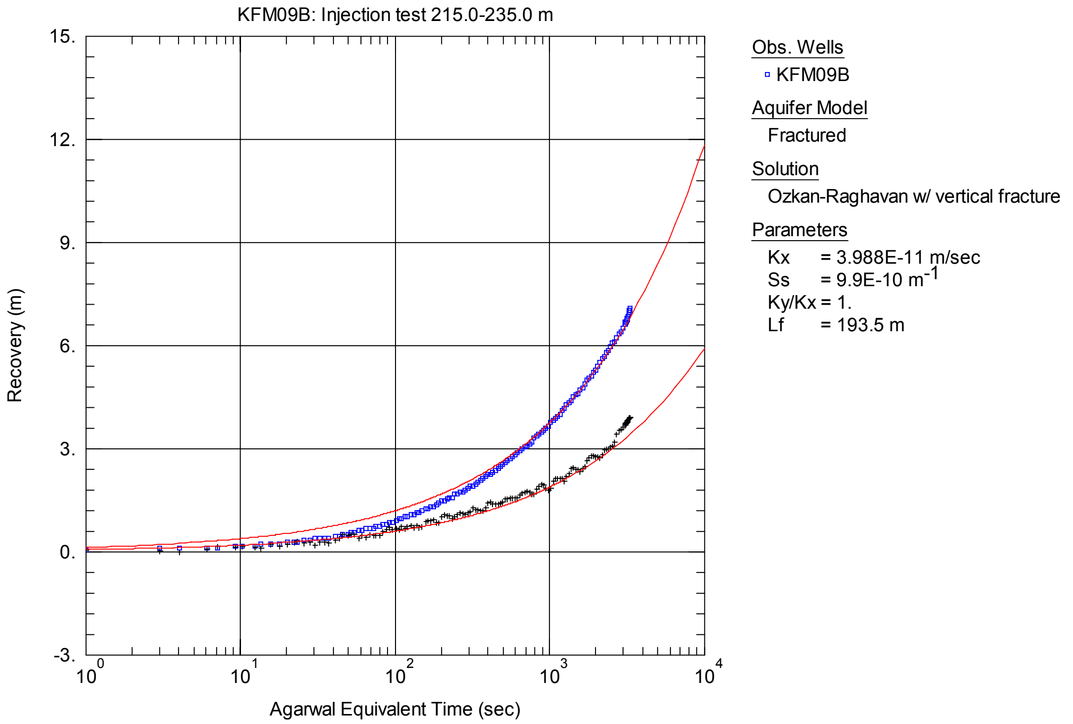


Figure A3-81. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 215.0-235.0 m in KFM09B.*

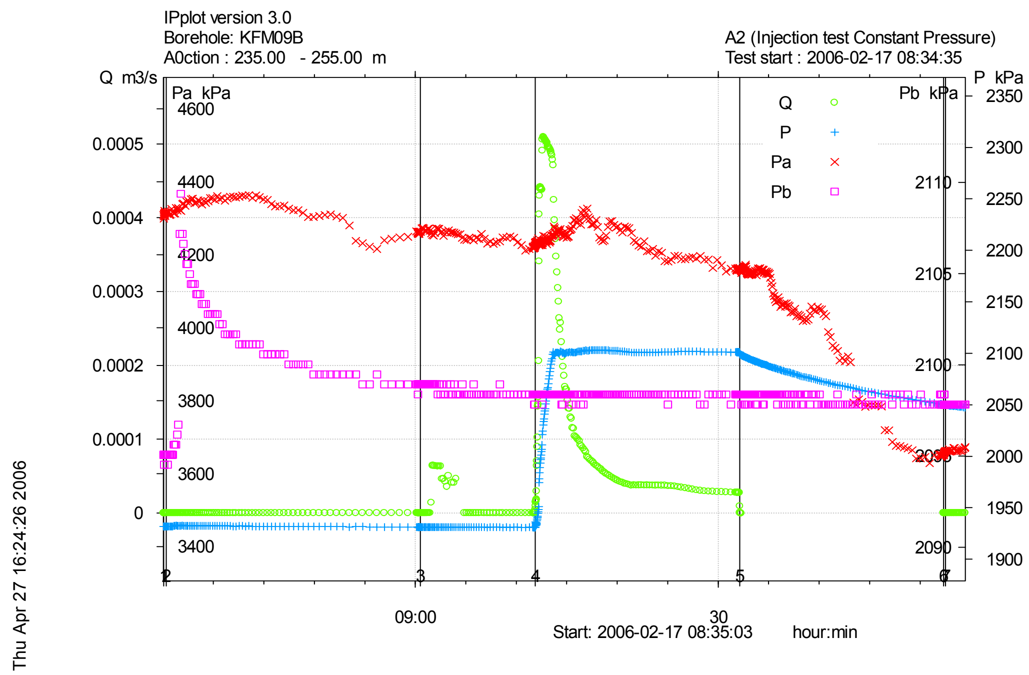


Figure A3-82. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 235.0-255.0 m in borehole KFM09B.*

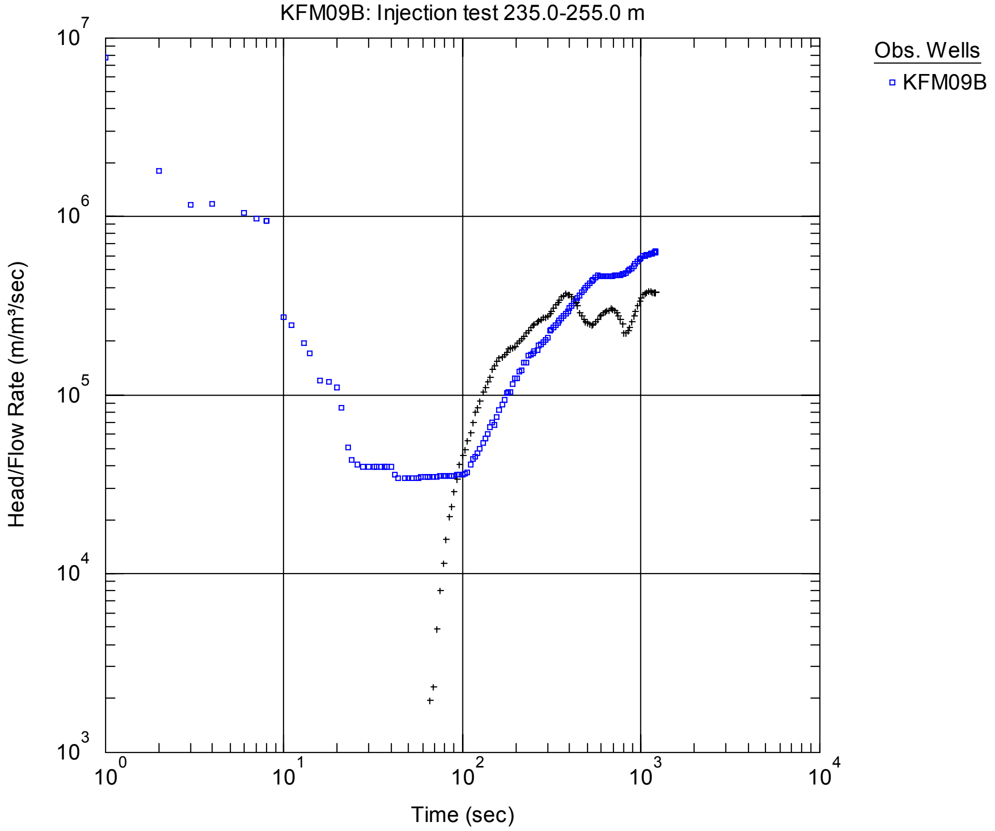


Figure A3-83. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 235.0-255.0 m in KFM09B.*

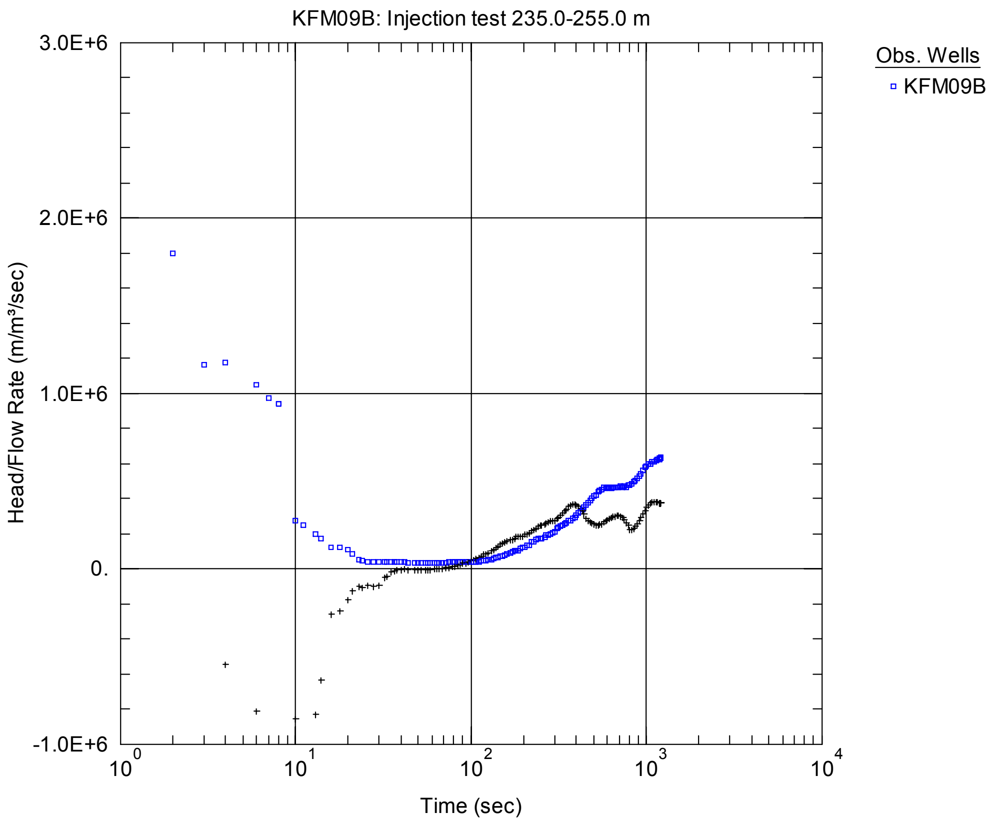


Figure A3-84. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 235.0-255.0 m in KFM09B.*

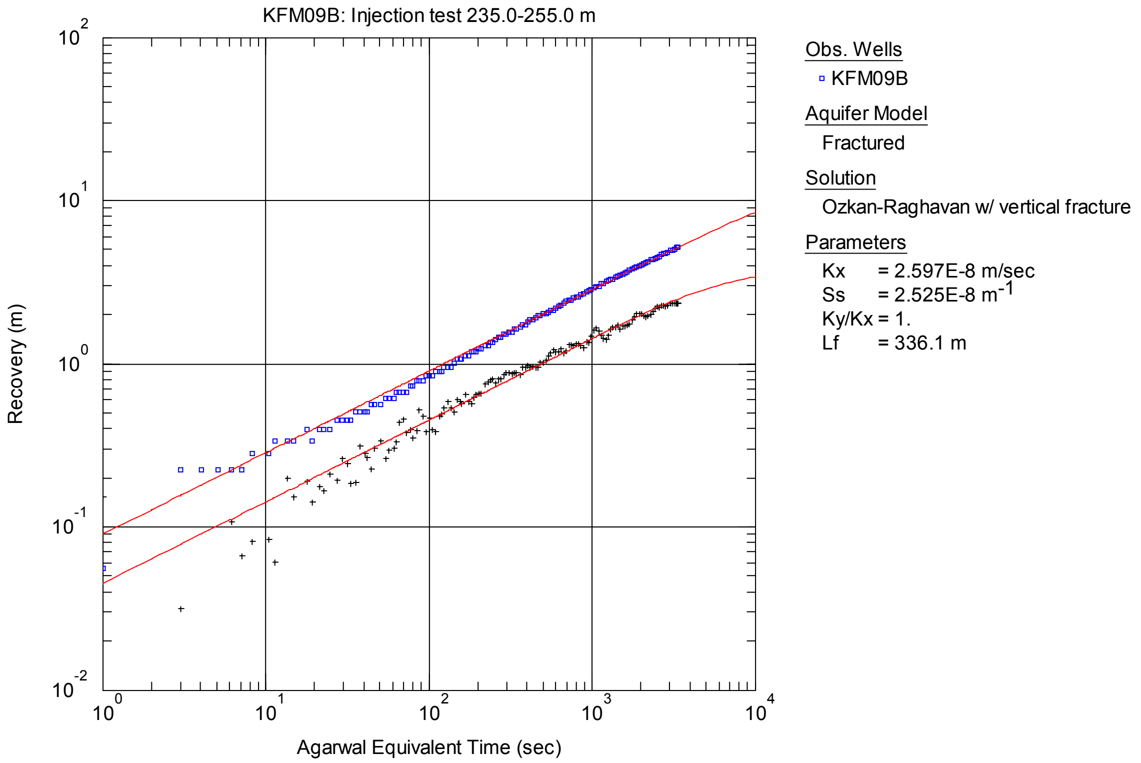


Figure A3-85. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 235.0-255.0 m in KFM09B.*

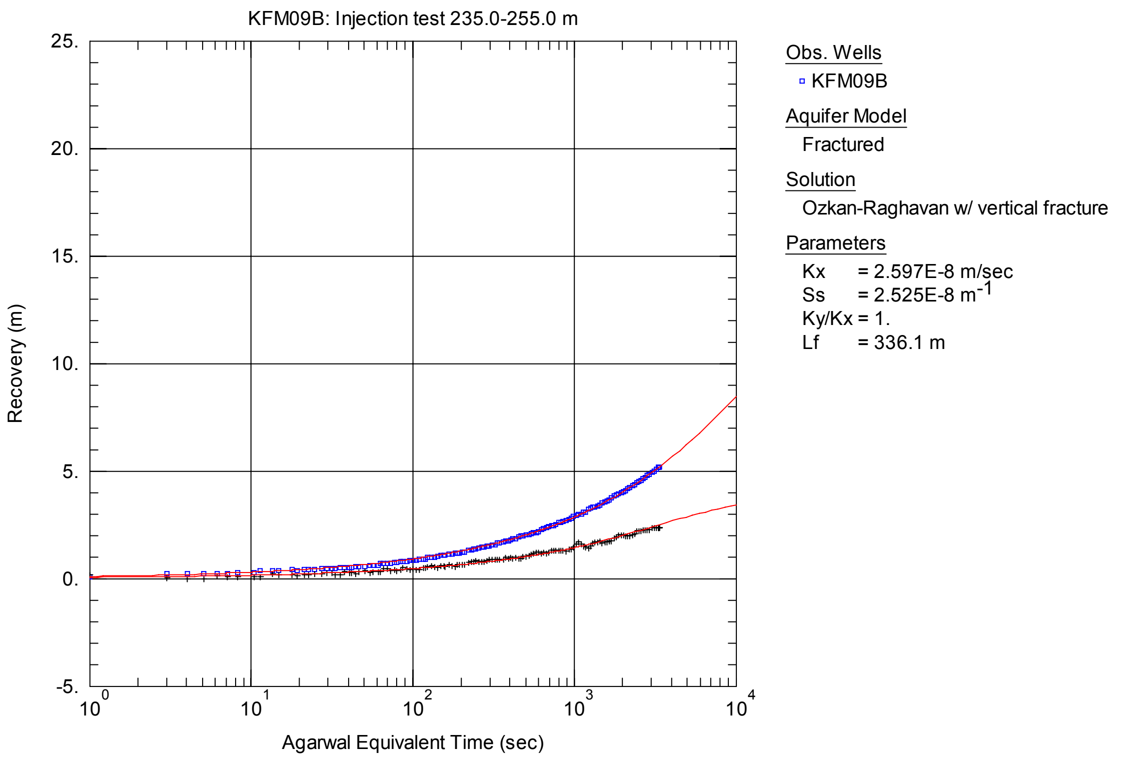


Figure A3-86. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 235.0-255.0 m in KFM09B.*

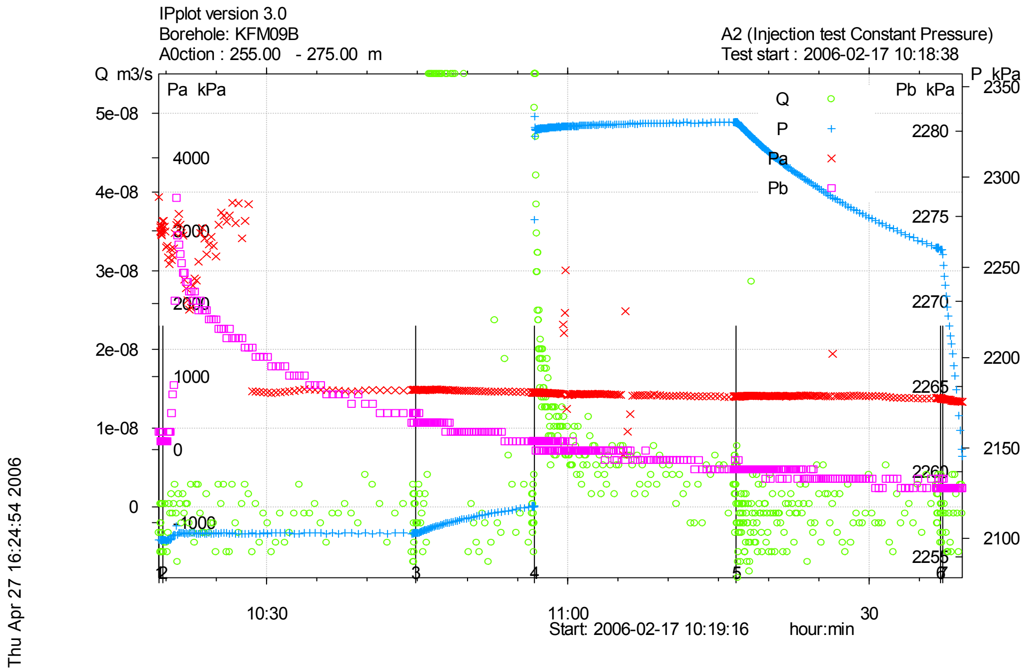


Figure A3-87. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 255.0-275.0 m in borehole KFM09B.*

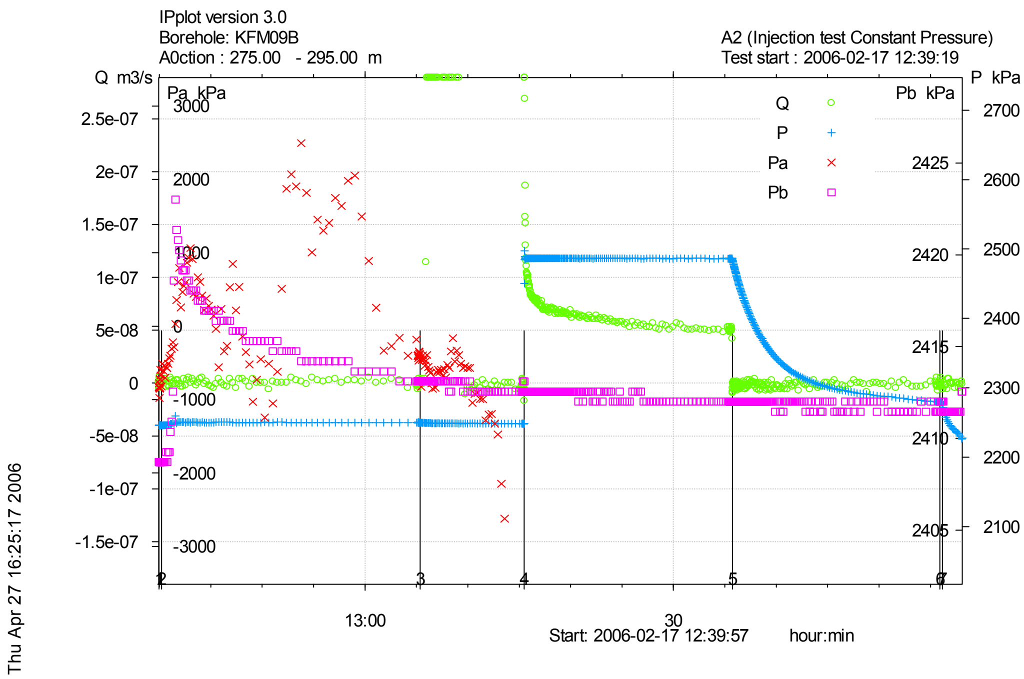


Figure A3-88. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 275.0-295.0 m in borehole KFM09B.*

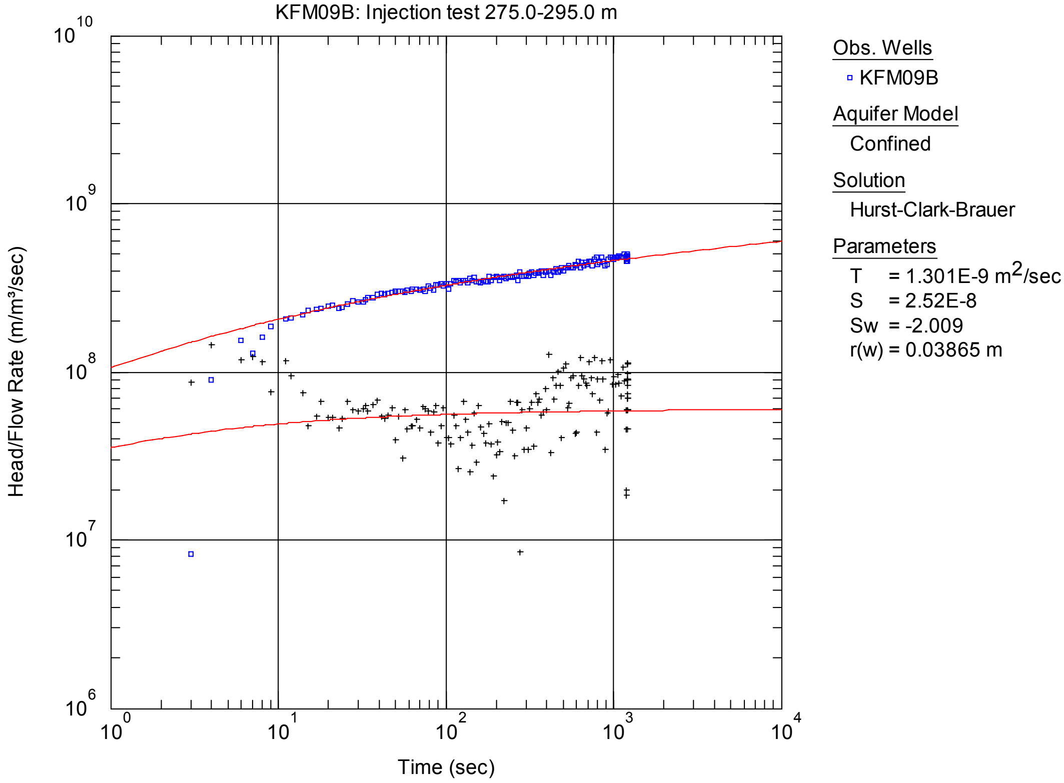


Figure A3-89. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 275.0-295.0 m in KFM09B.*

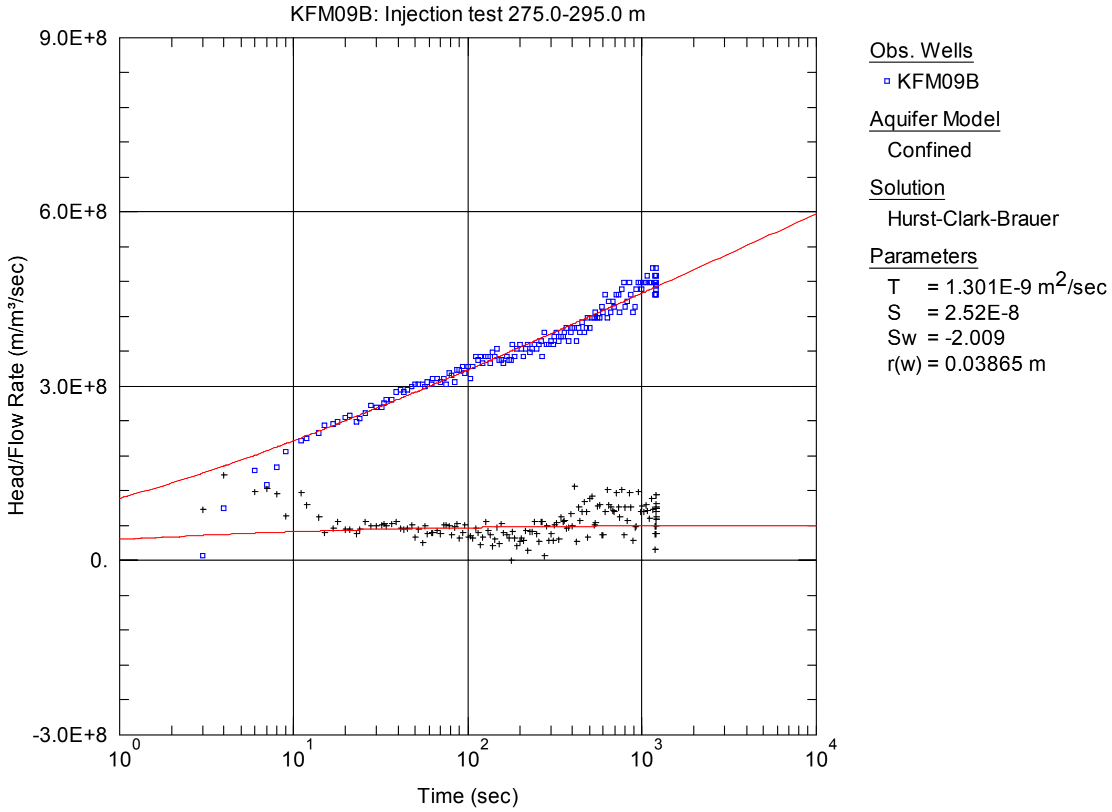


Figure A3-90. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 275.0-295.0 m in KFM09B.*

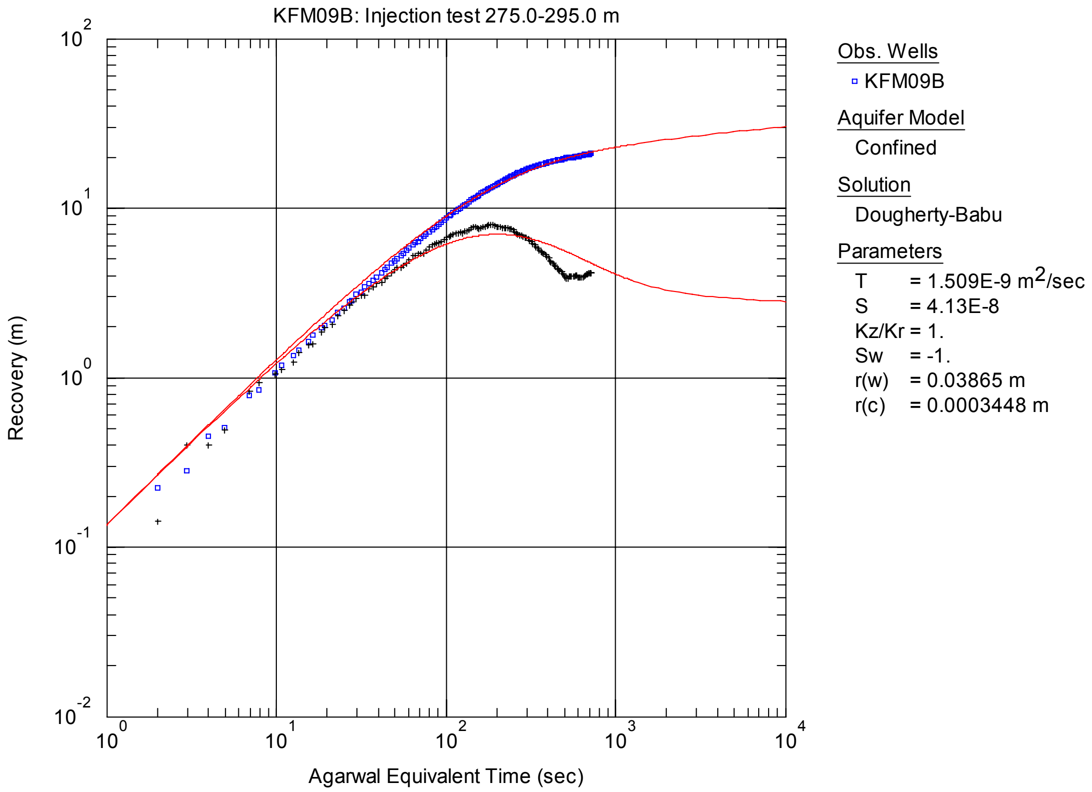


Figure A3-91. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 275.0-295.0 m in KFM09B. The type curve fit is showing a possible, however not unambiguous, evaluation.*

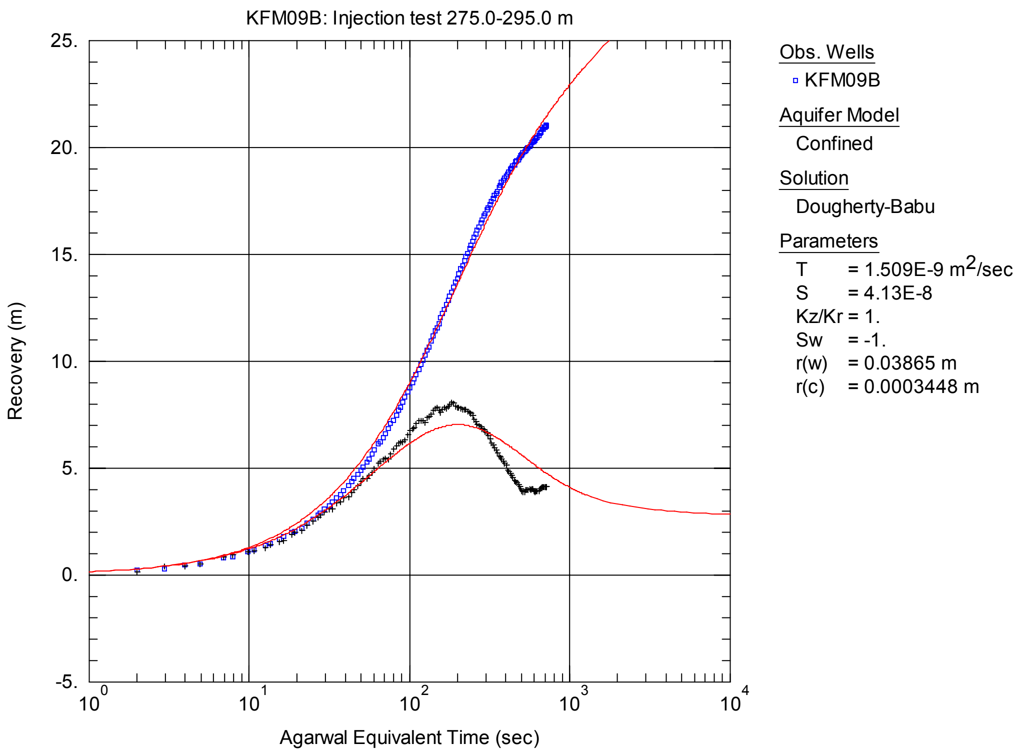


Figure A3-92. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 275.0-295.0 m in KFM09B. The type curve fit is showing a possible, however not unambiguous, evaluation.*

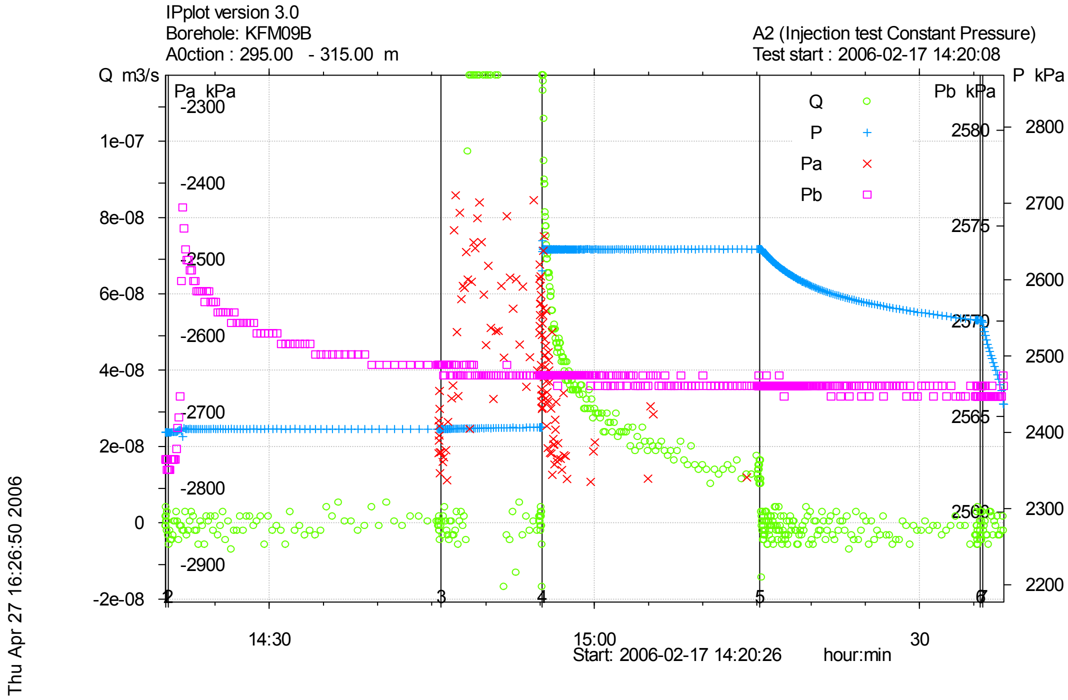


Figure A3-93. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 295.0-315.0 m in borehole KFM09B.*

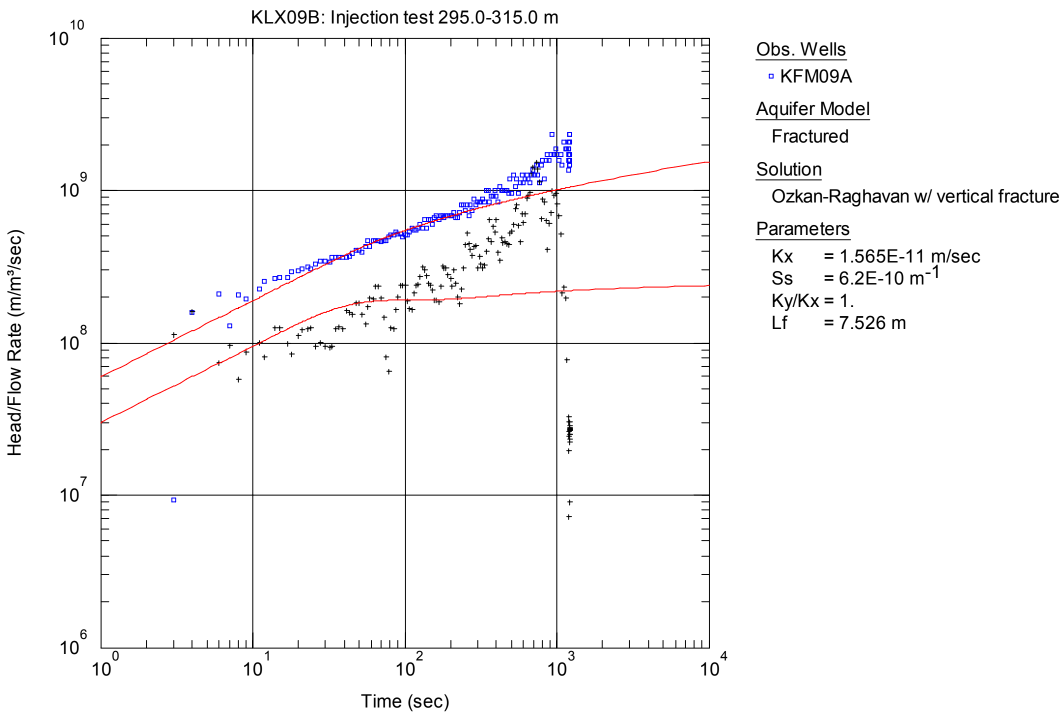


Figure A3-94. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 295.0-315.0 m in KFM09B.*

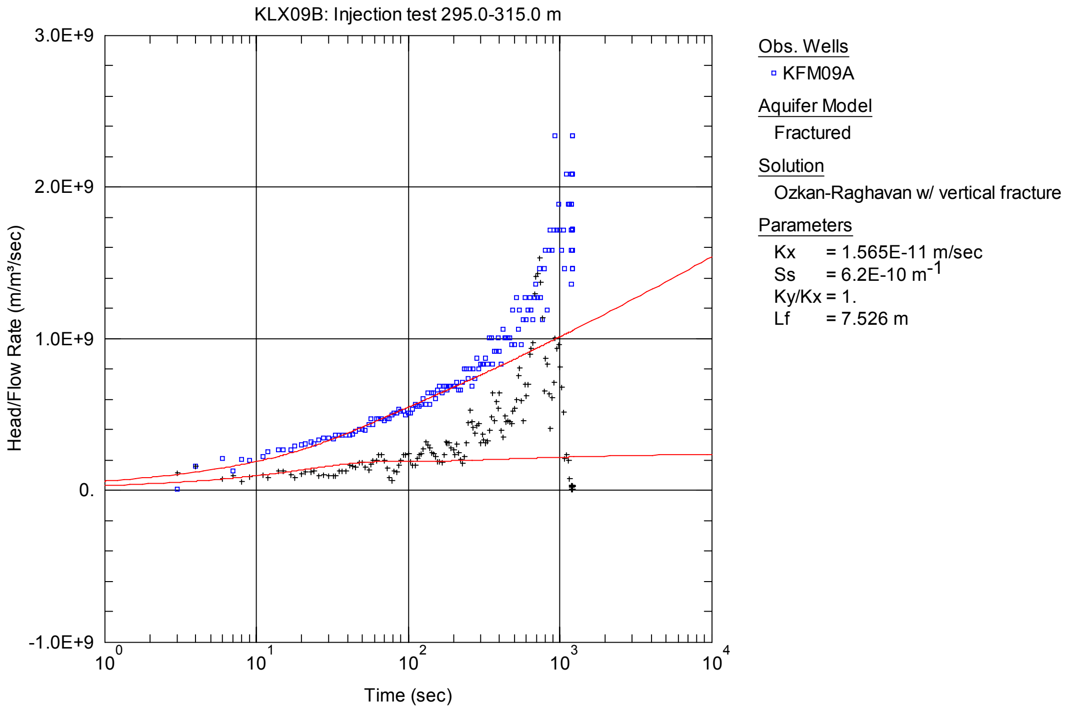


Figure A3-95. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 295.0-315.0 m in KFM09B.*

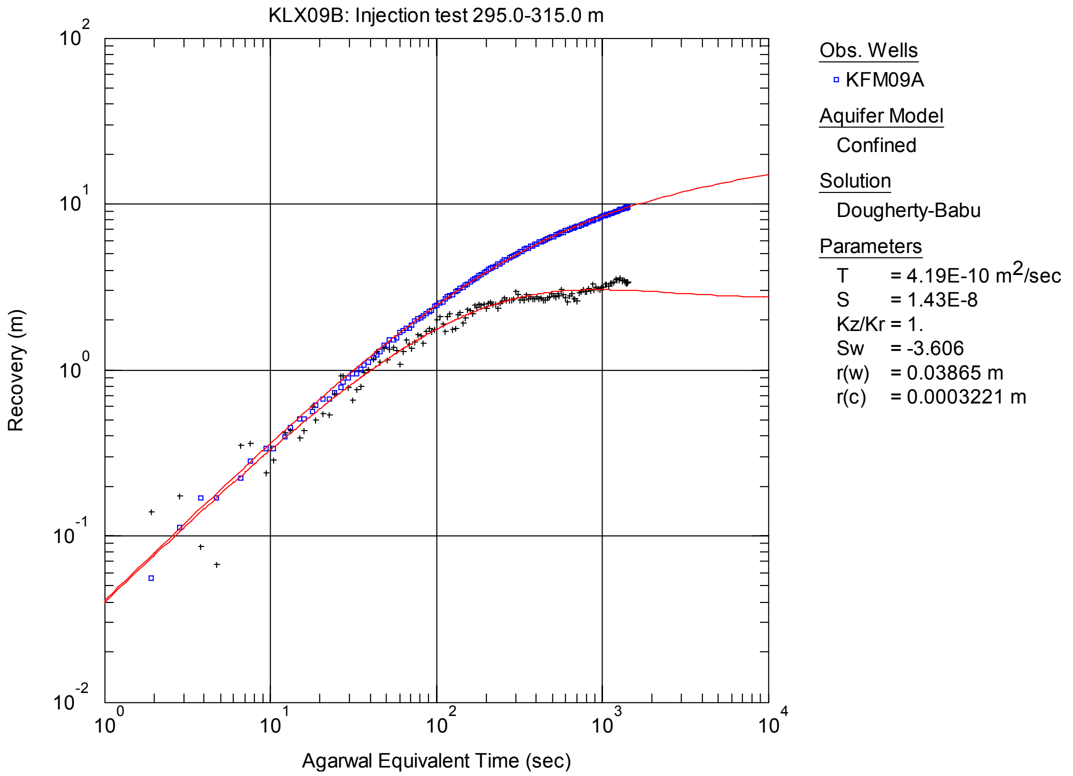


Figure A3-96. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 295.0-315.0 m in KFM09B.*

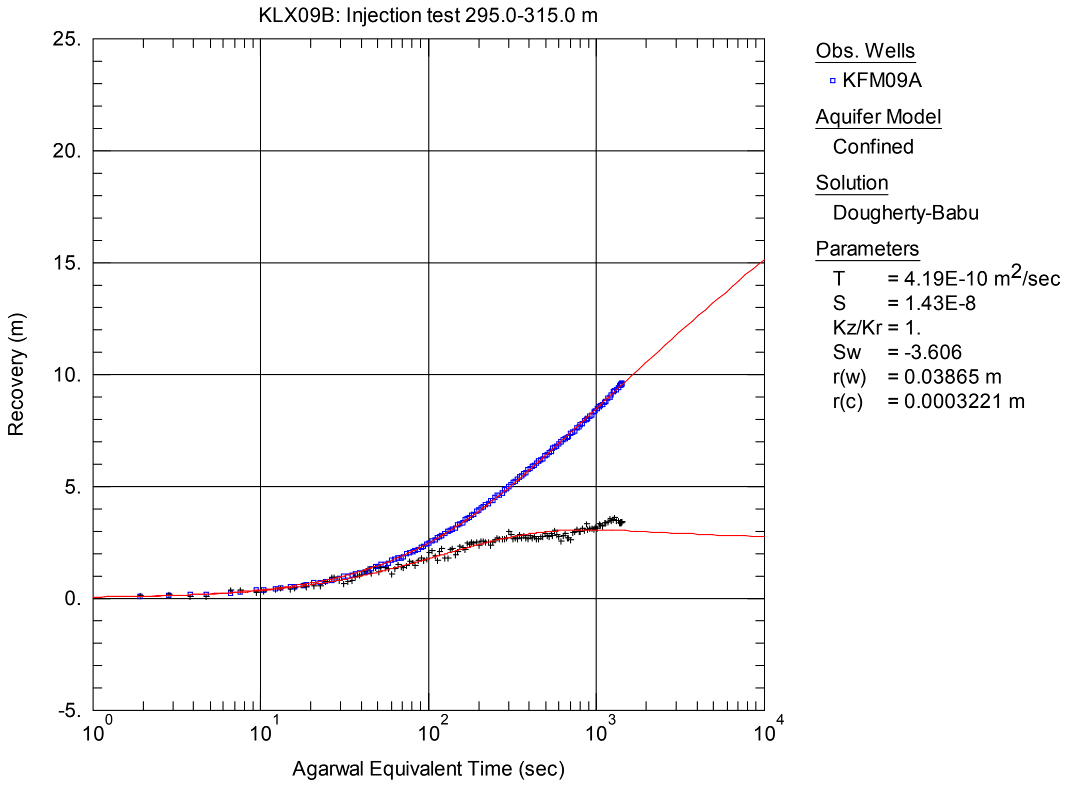


Figure A3-97. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 295.0-315.0 m in KFM09B.*

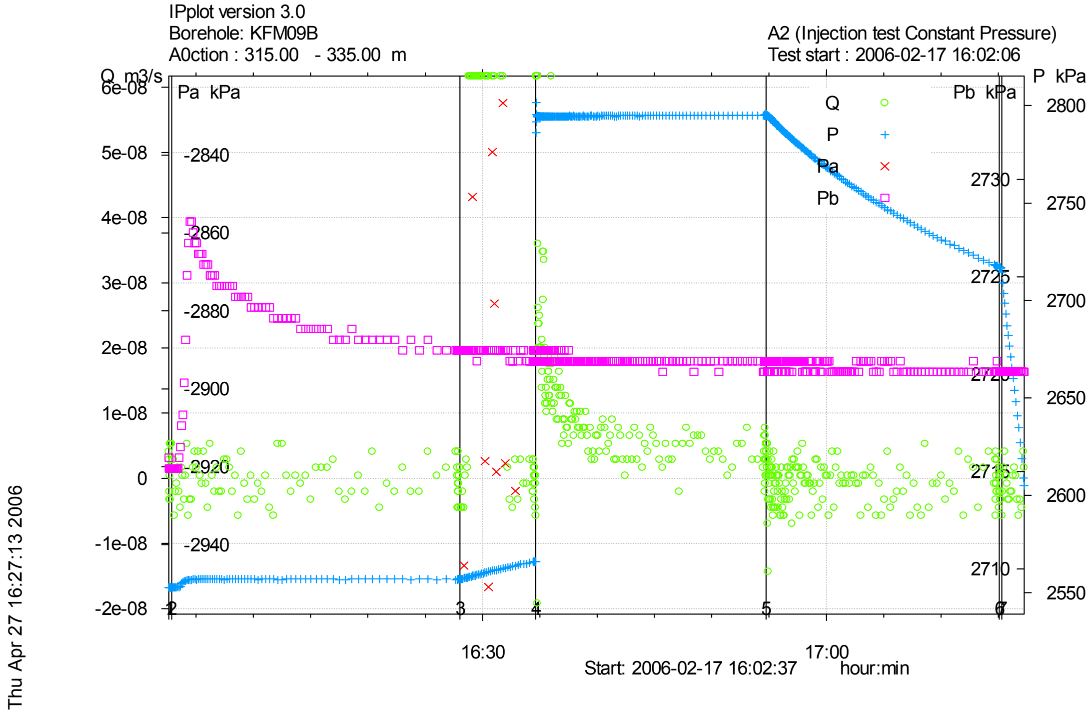


Figure A3-98. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 315.0-335.0 m in borehole KFM09B.*

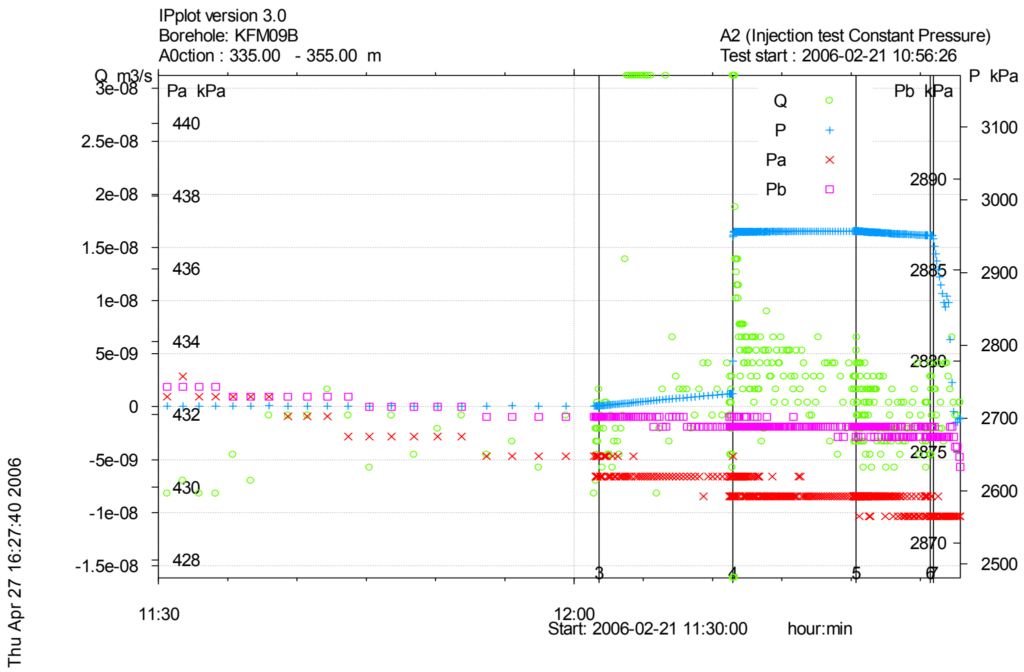


Figure A3-99. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 335.0-355.0 m in borehole KFM09B.*

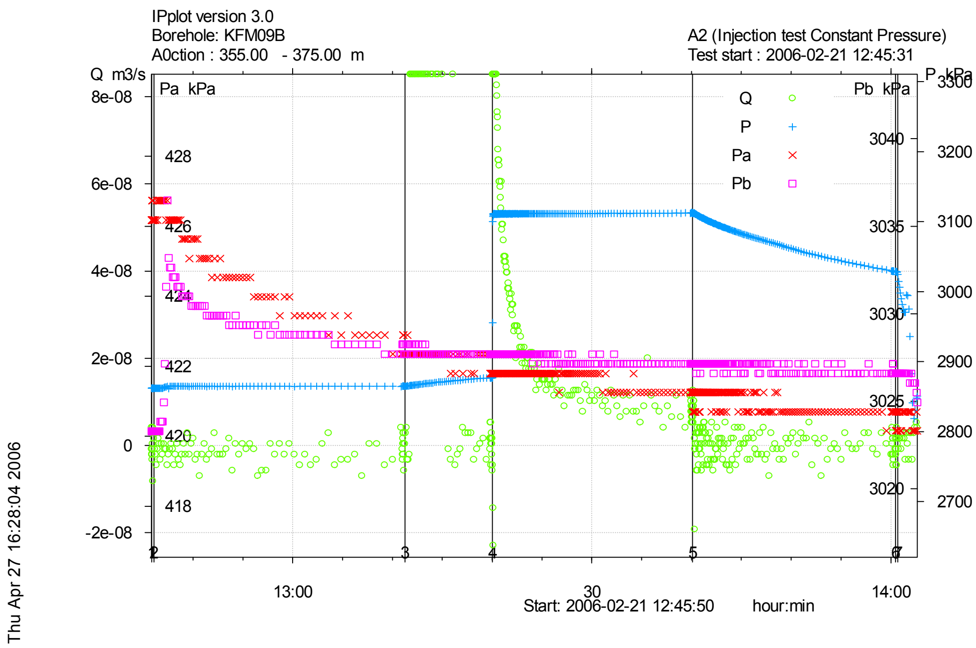


Figure A3-100. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 355.0-375.0 m in borehole KFM09B.*

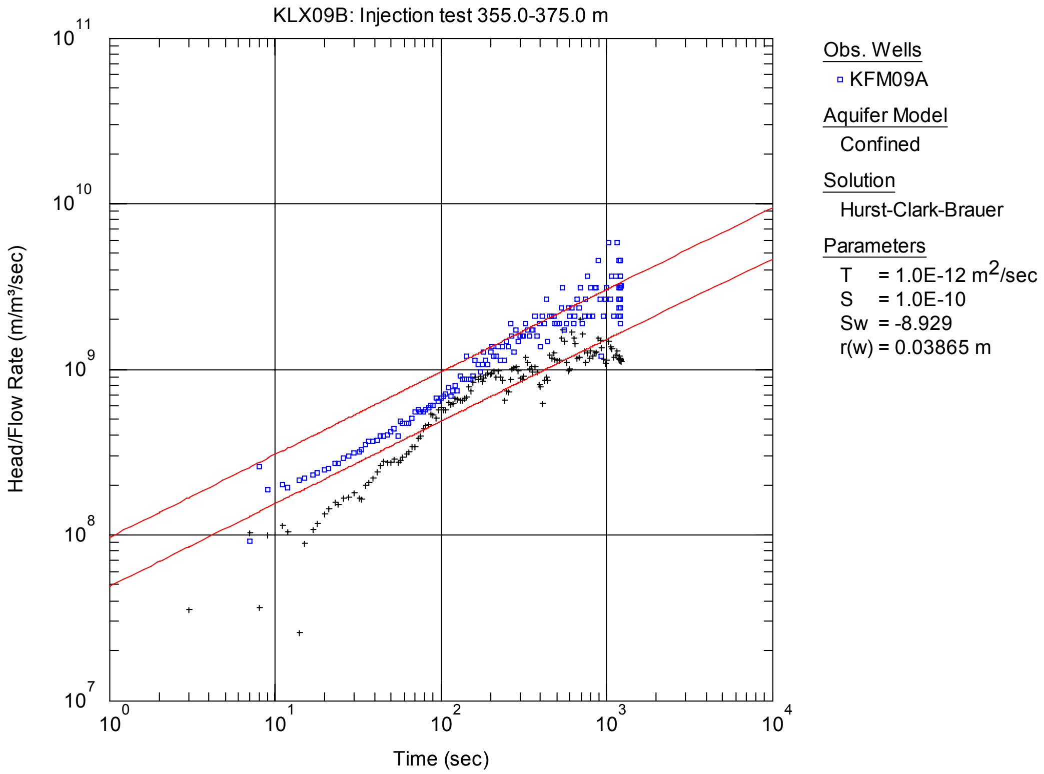


Figure A3-101. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 355.0-375.0 m in KFM09B. The type curve fit is only to show that an assumption of radial flow is not valid.*

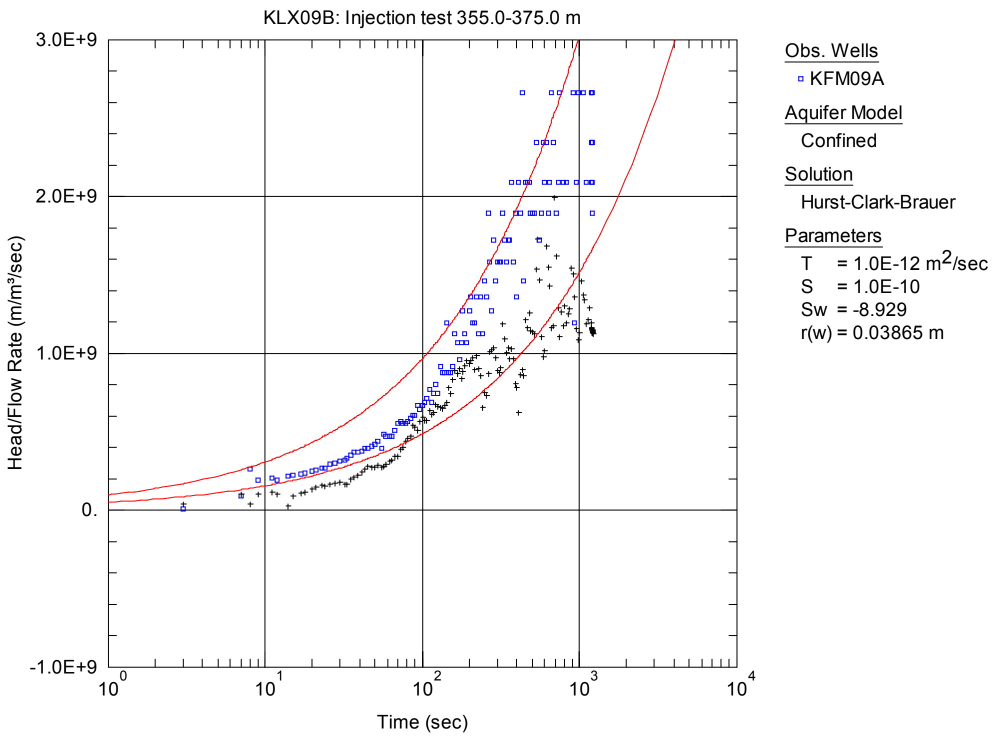


Figure A3-102. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 355.0-375.0 m in KFM09B. The type curve fit is only to show that an assumption of radial flow is not valid.*

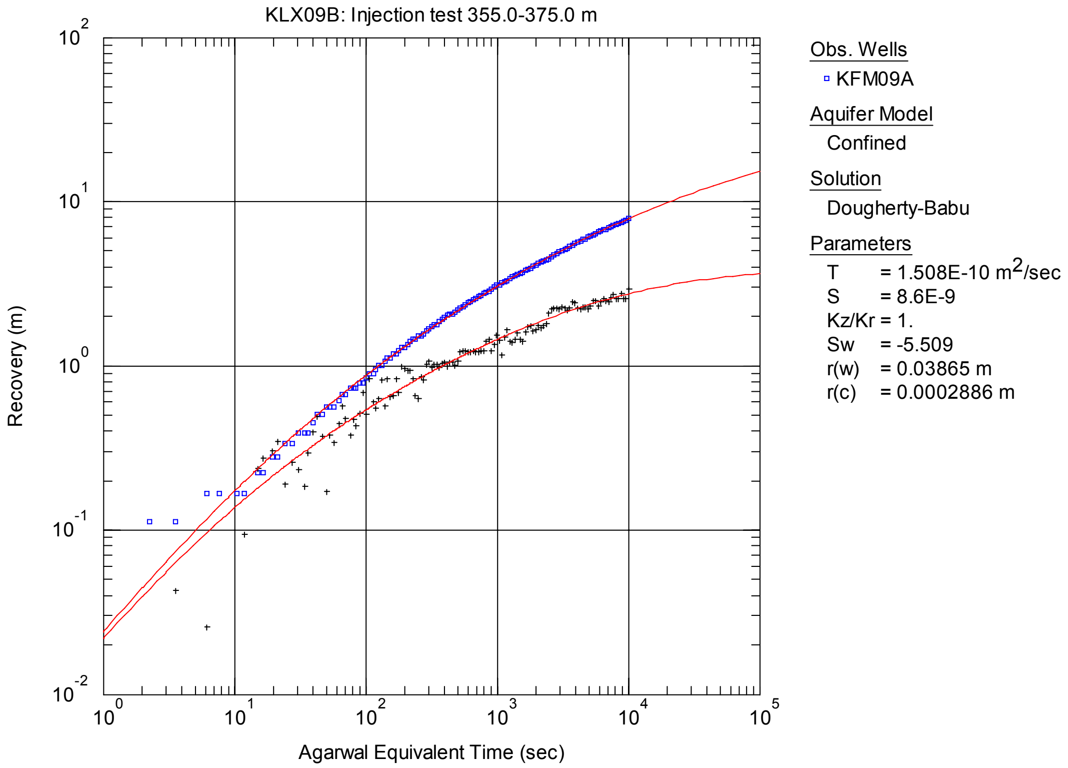


Figure A3-103. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 355.0-375.0 m in KFM09B.*

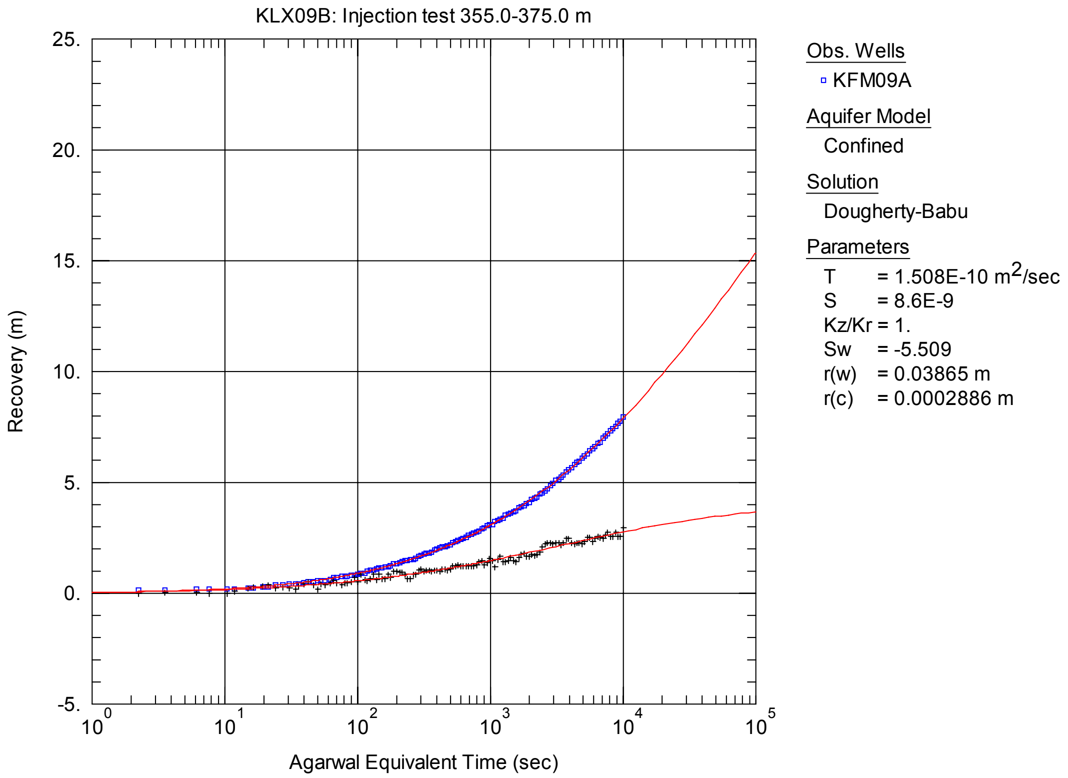


Figure A3-104. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 355.0-375.0 m in KFM09B.*

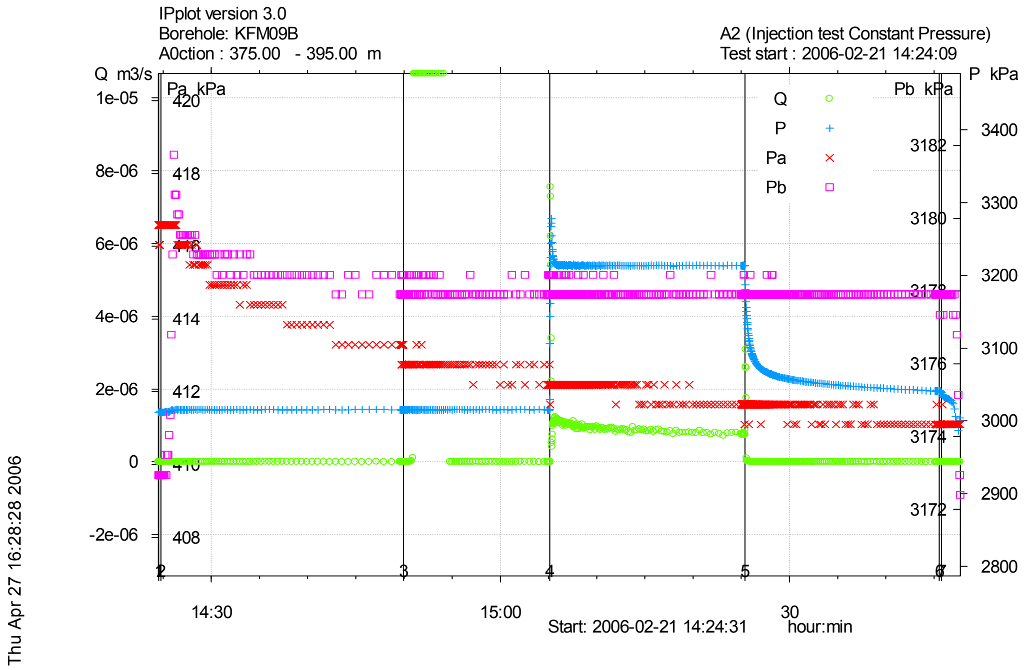


Figure A3-105. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 375.0-395.0 m in borehole KFM09B.*

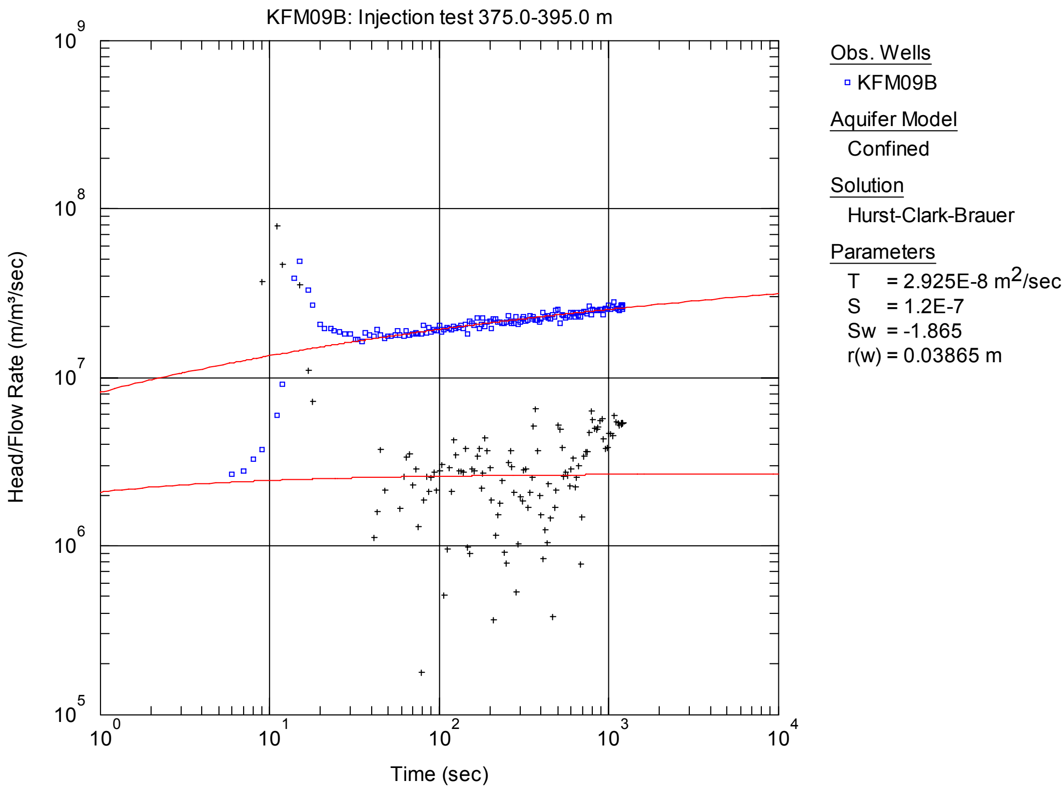


Figure A3-106. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 375.0-395.0 m in KFM09B.*

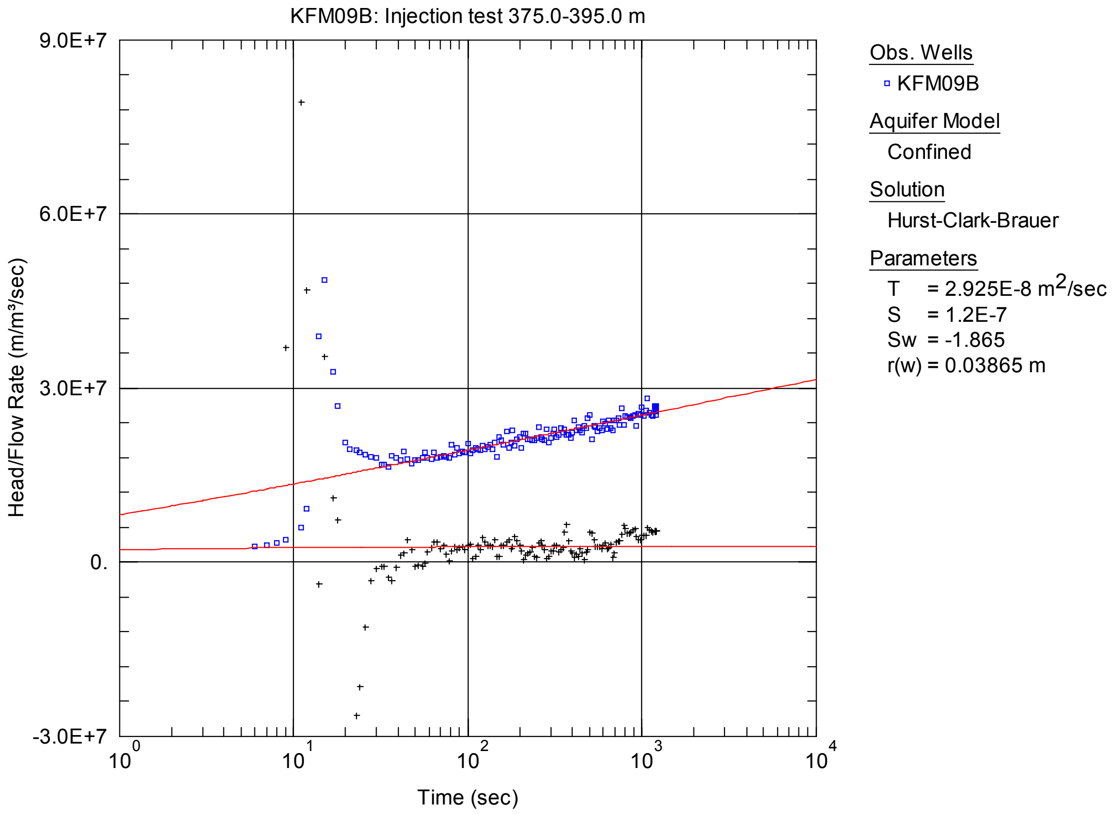


***Figure A3-107.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 375.0-395.0 m in KFM09B.*

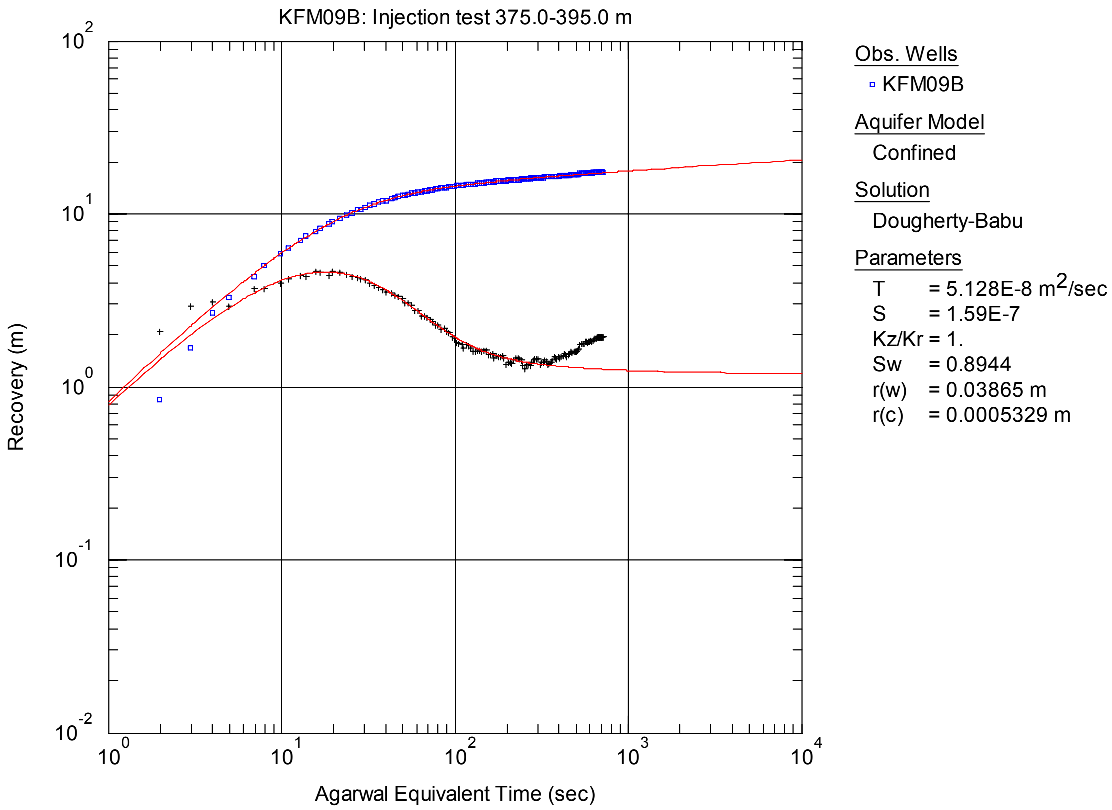


***Figure A3-108.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 375.0-395.0 m in KFM09B.*

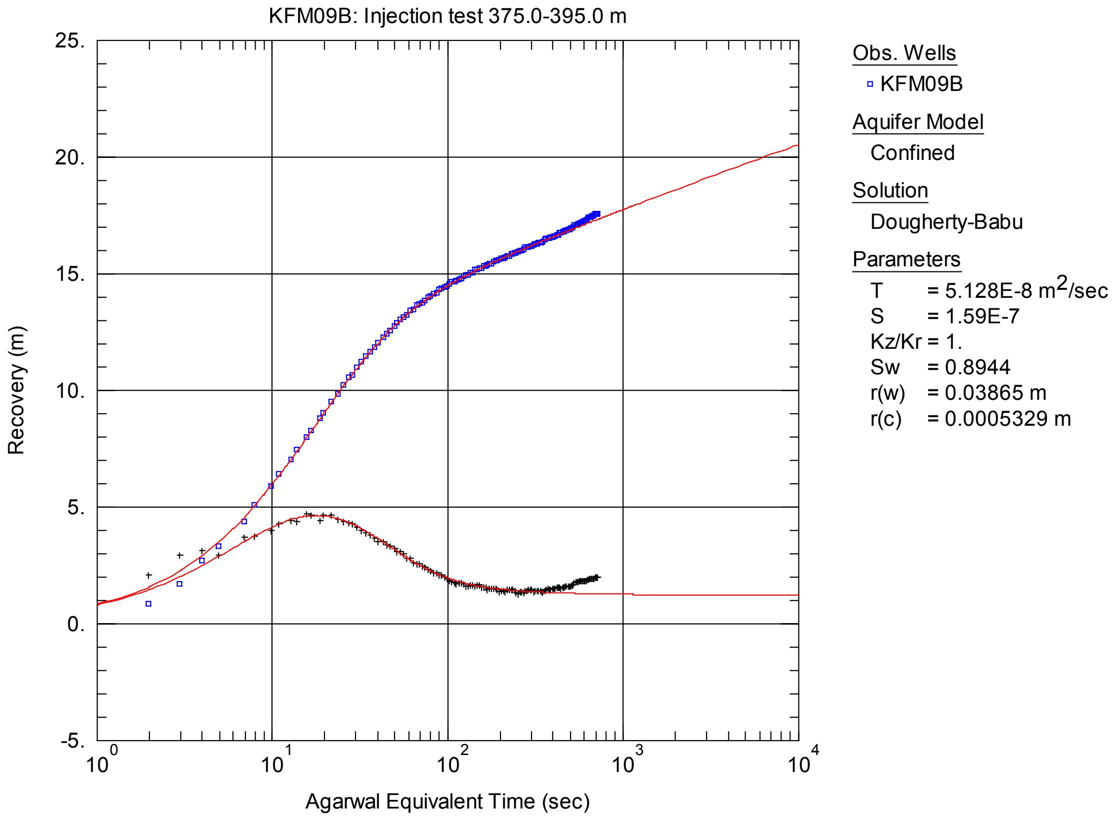


Figure A3-109. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 375.0-395.0 m in KFM09B.*

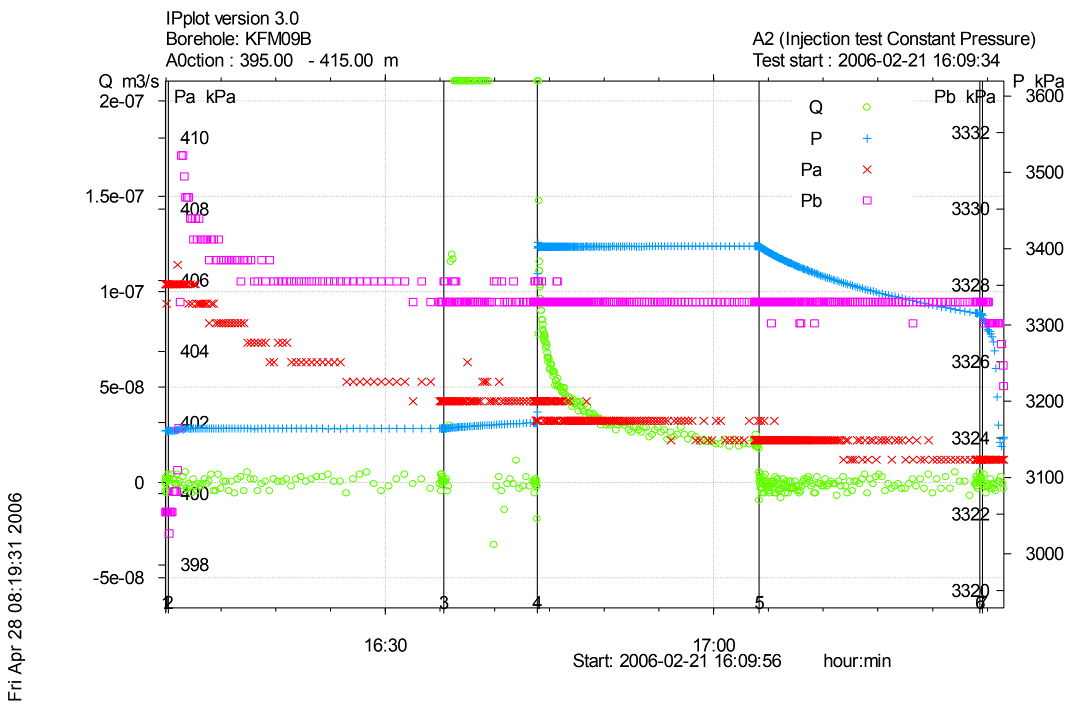


Figure A3-110. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 395.0-415.0 m in borehole KFM09B.*

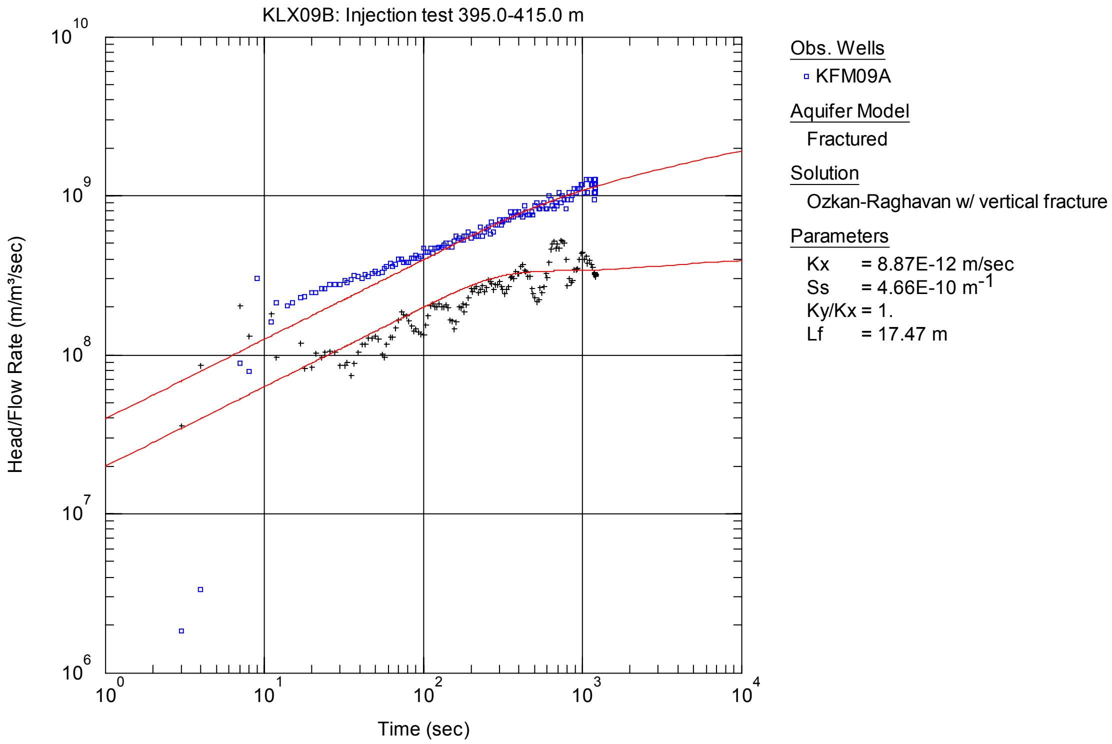


Figure A3-111. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 395.0-415.0 m in KFM09B.*

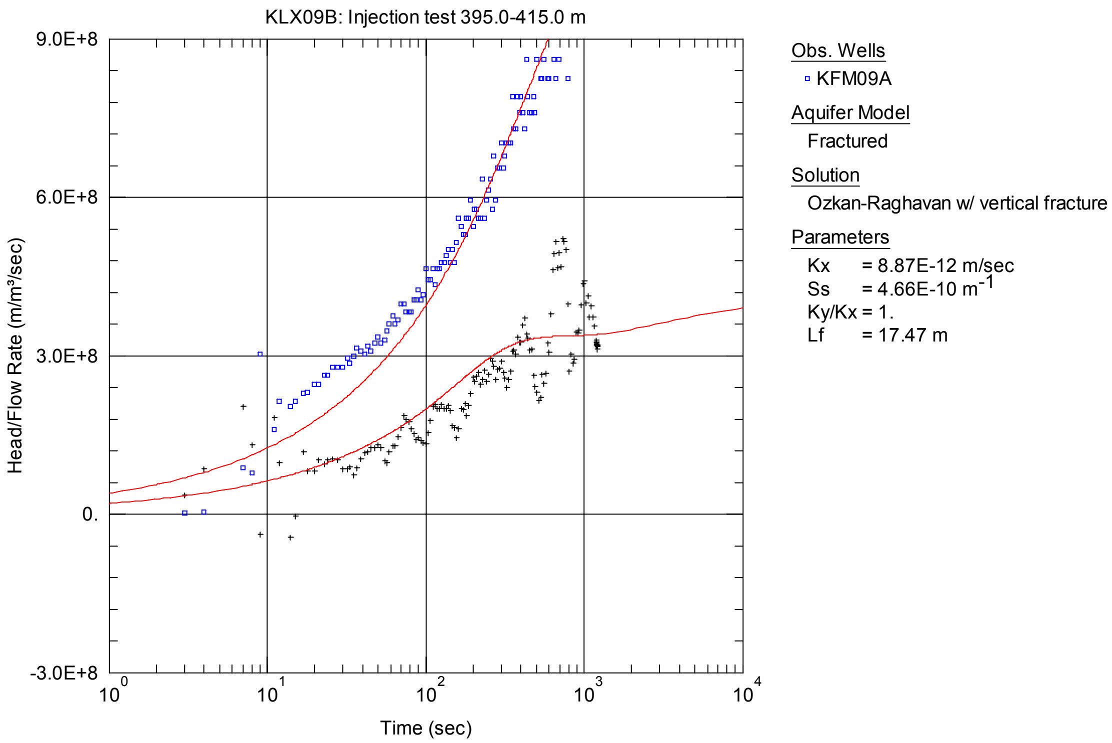


Figure A3-112. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 395.0-415.0 m in KFM09B.*

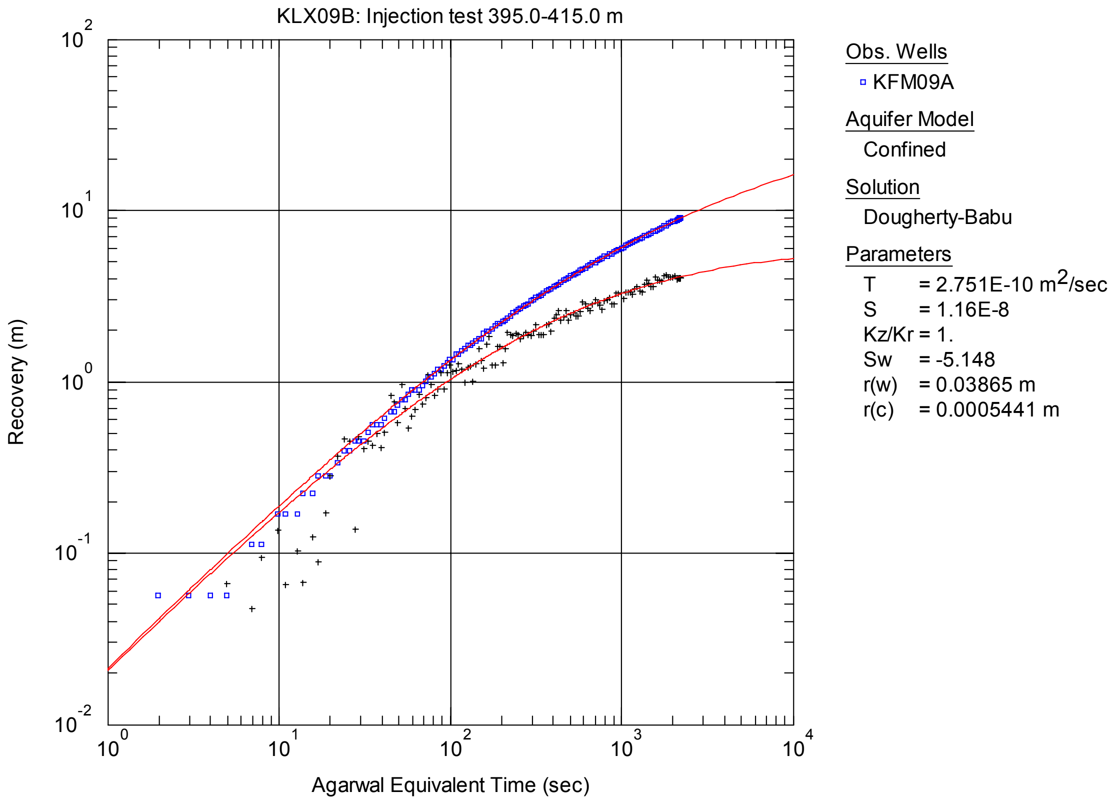


Figure A3-113. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 395.0-415.0 m in KFM09B.*

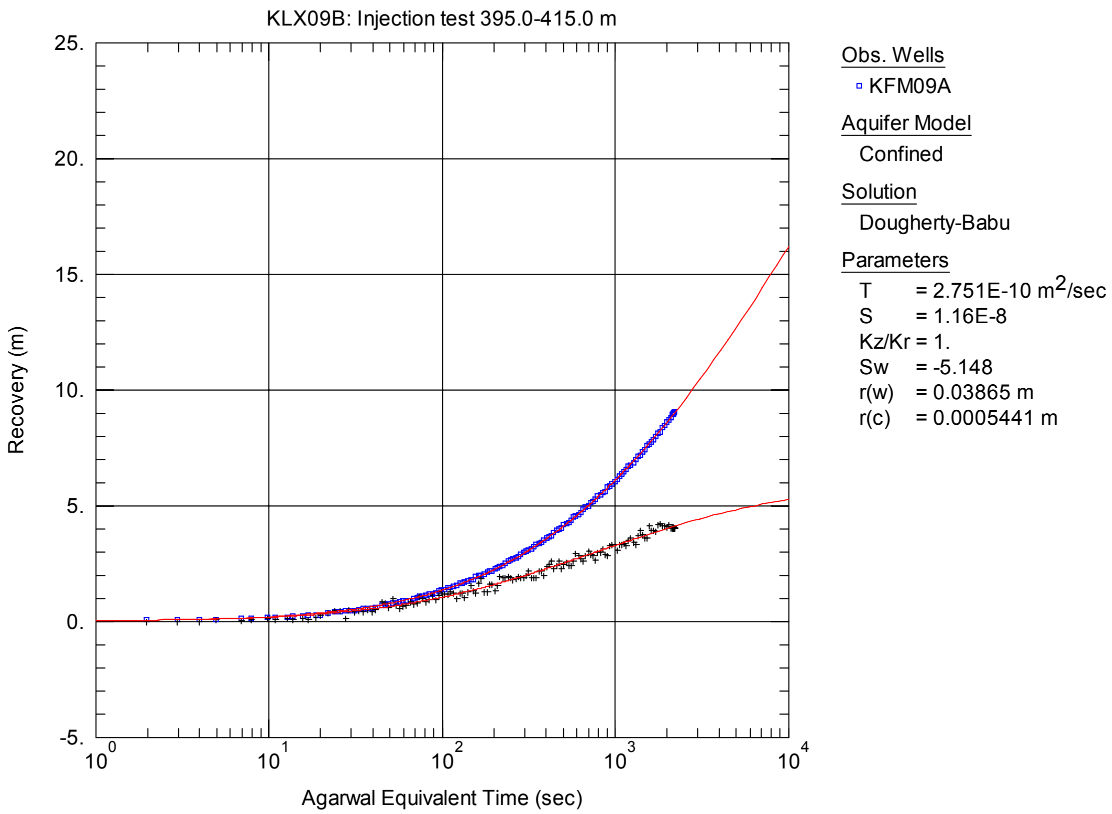


Figure A3-114. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 395.0-415.0 m in KFM09B.*

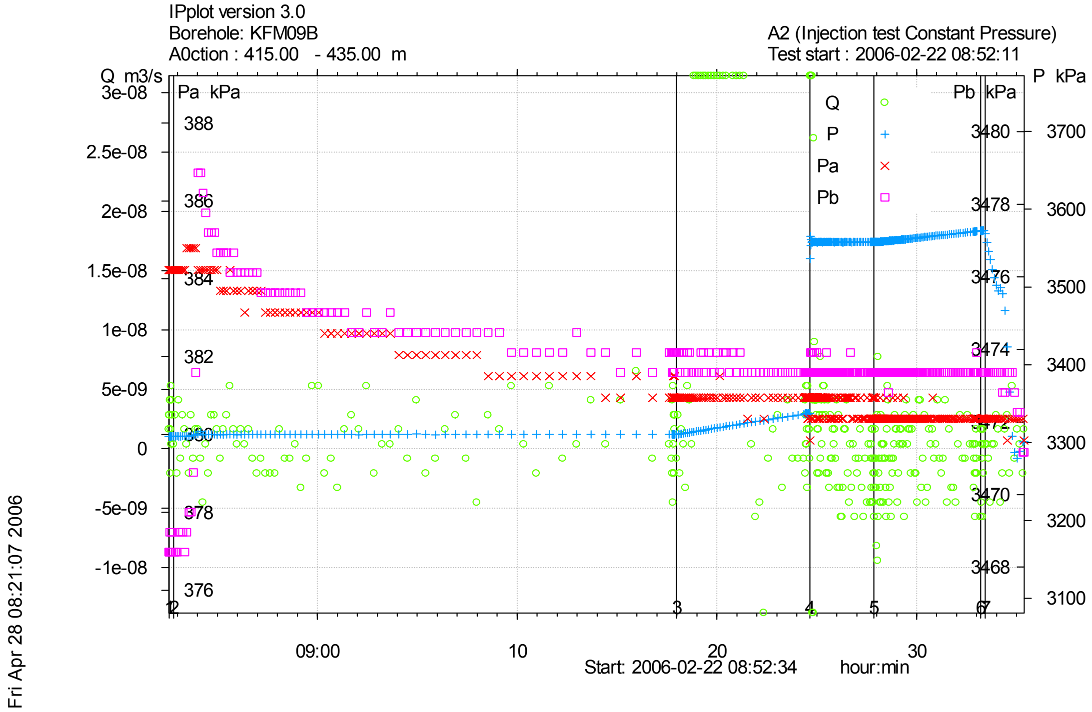


Figure A3-115. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 415.0-435.0 m in borehole KFM09B.*

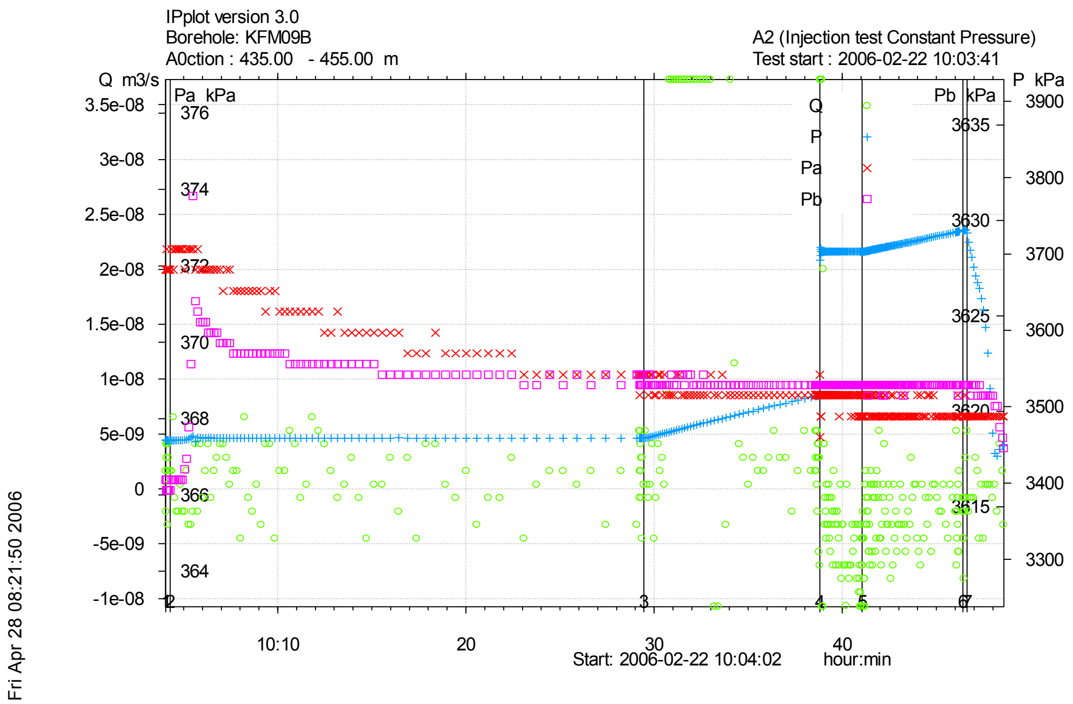


Figure A3-116. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 435.0-455.0 m in borehole KFM09B.*

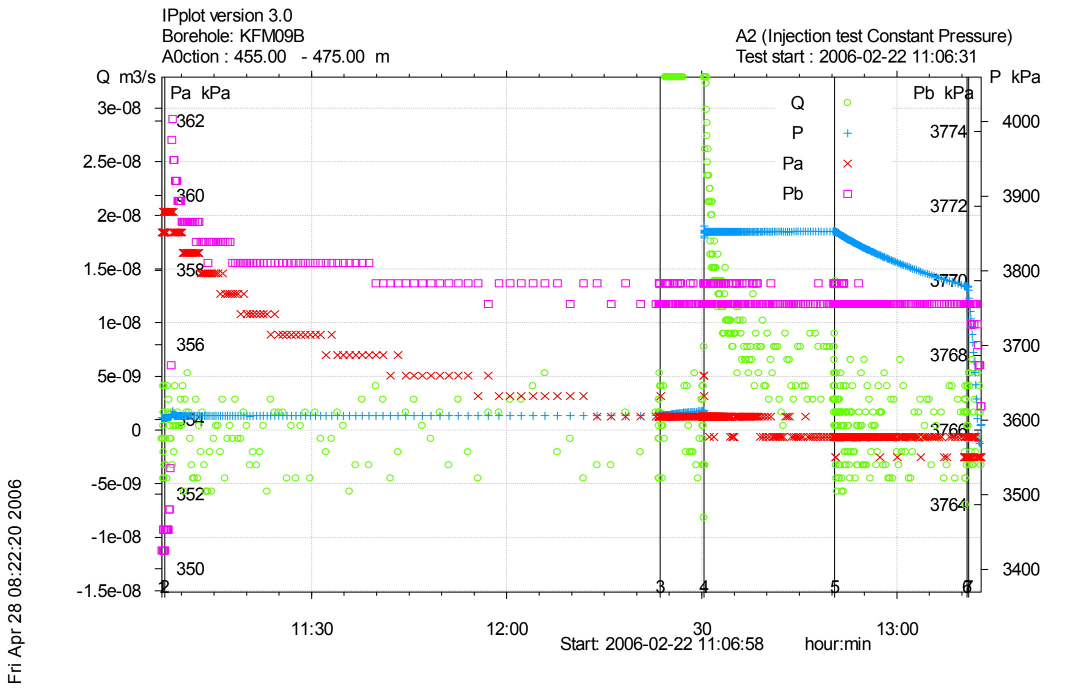


Figure A3-117. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 455.0-475.0 m in borehole KFM09B.*

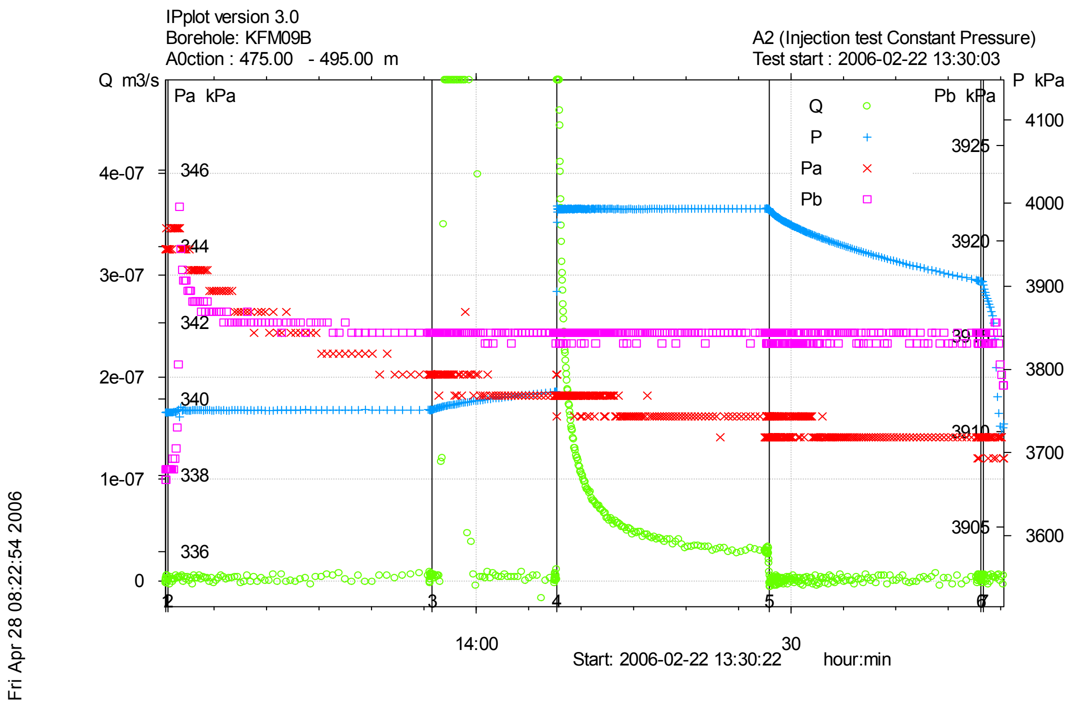


Figure A3-118. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 475.0-495.0 m in borehole KFM09B.*

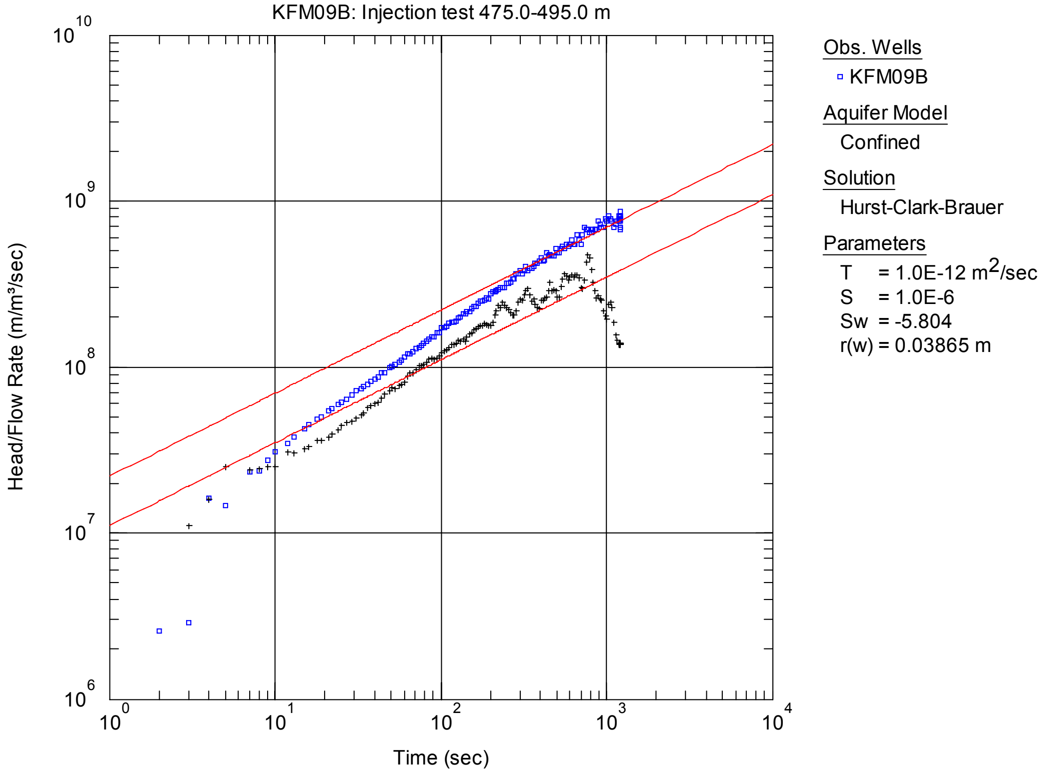


Figure A3-119. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 475.0-495.0 m in KFM09B. No unambiguous transient evaluation was possible from the injection period. This solution is only shown for demonstrative purposes.*

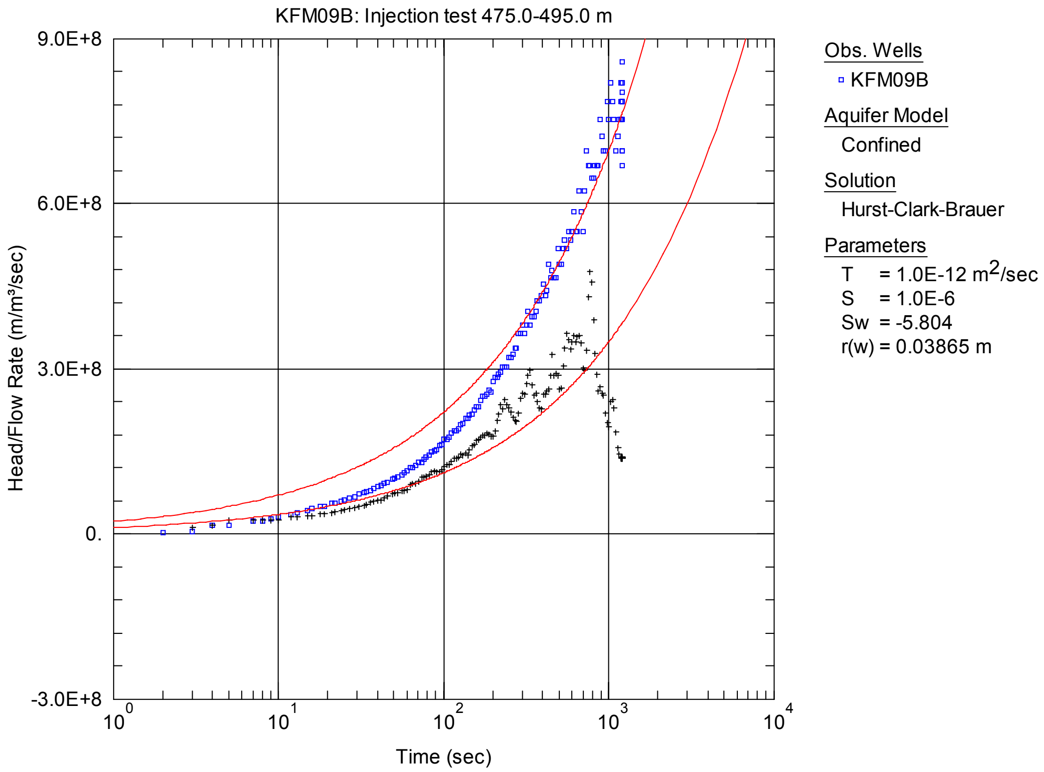


Figure A3-120. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 475.0-495.0 m in KFM09B. No unambiguous transient evaluation was possible from the injection period. This solution is only shown for demonstrative purposes.*

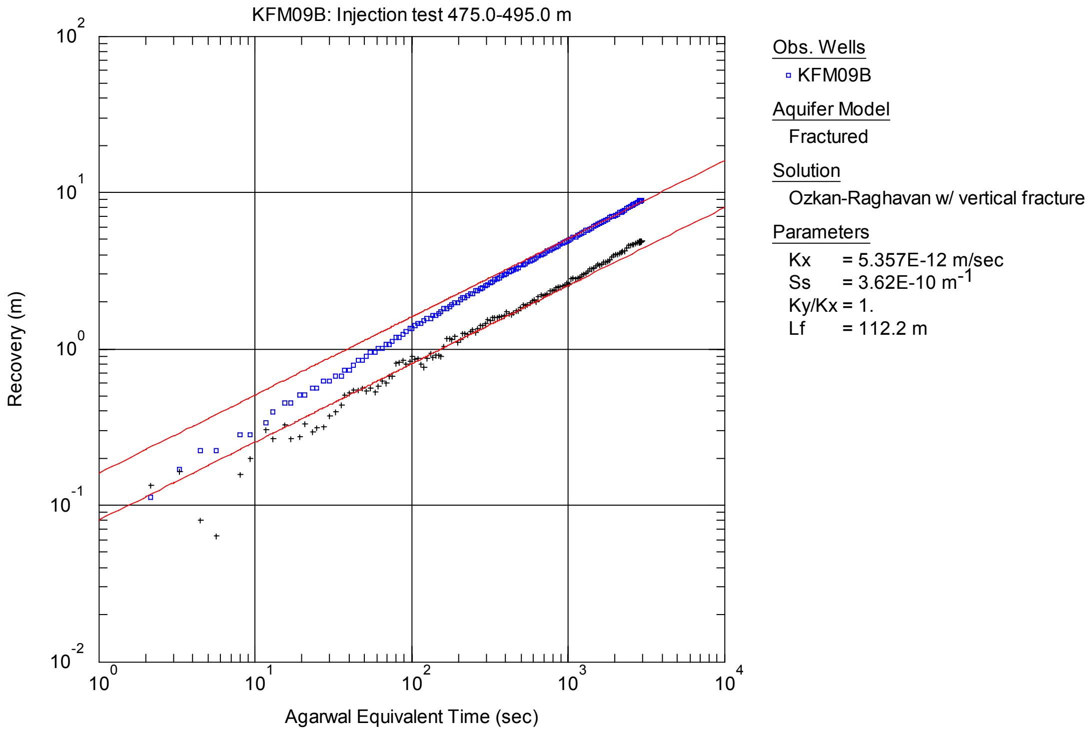


Figure A3-121. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 475.0-495.0 m in KFM09B.*

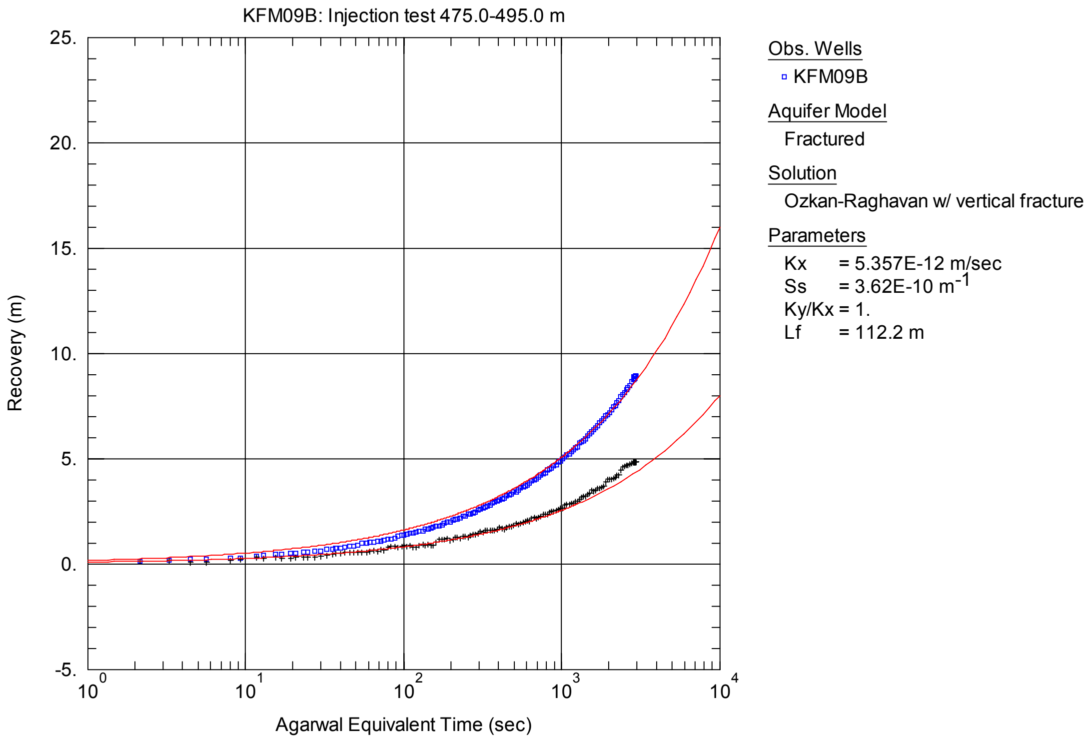


Figure A3-122. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 475.0-495.0 m in KFM09B.*

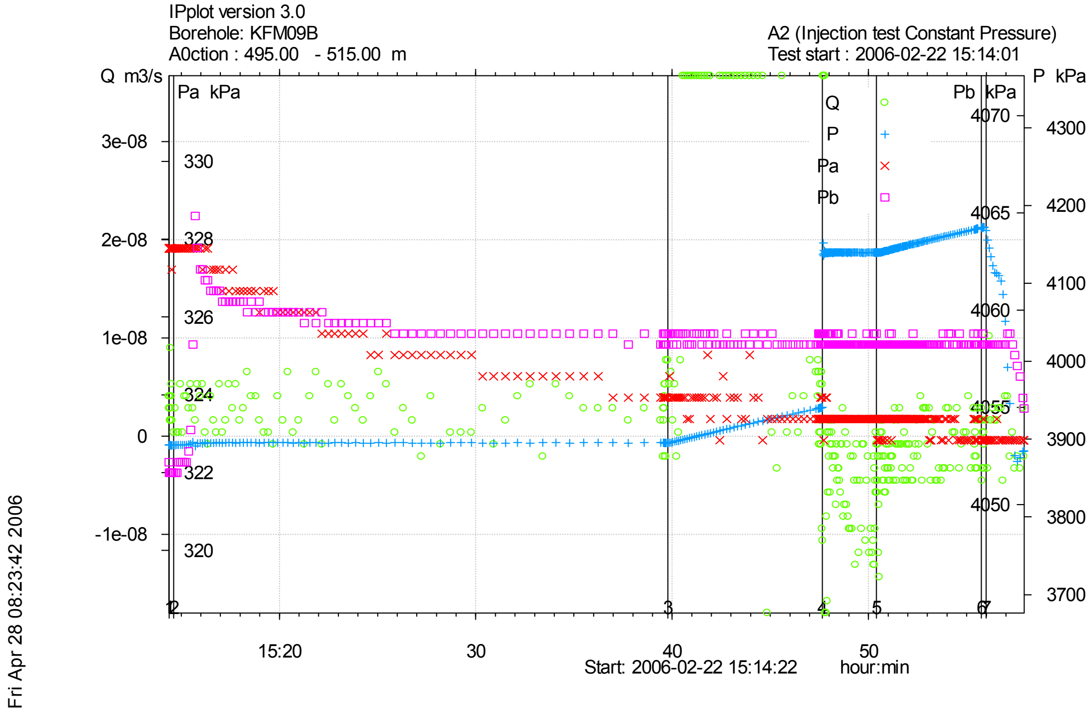


Figure A3-123. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 495.0-515.0 m in borehole KFM09B.*

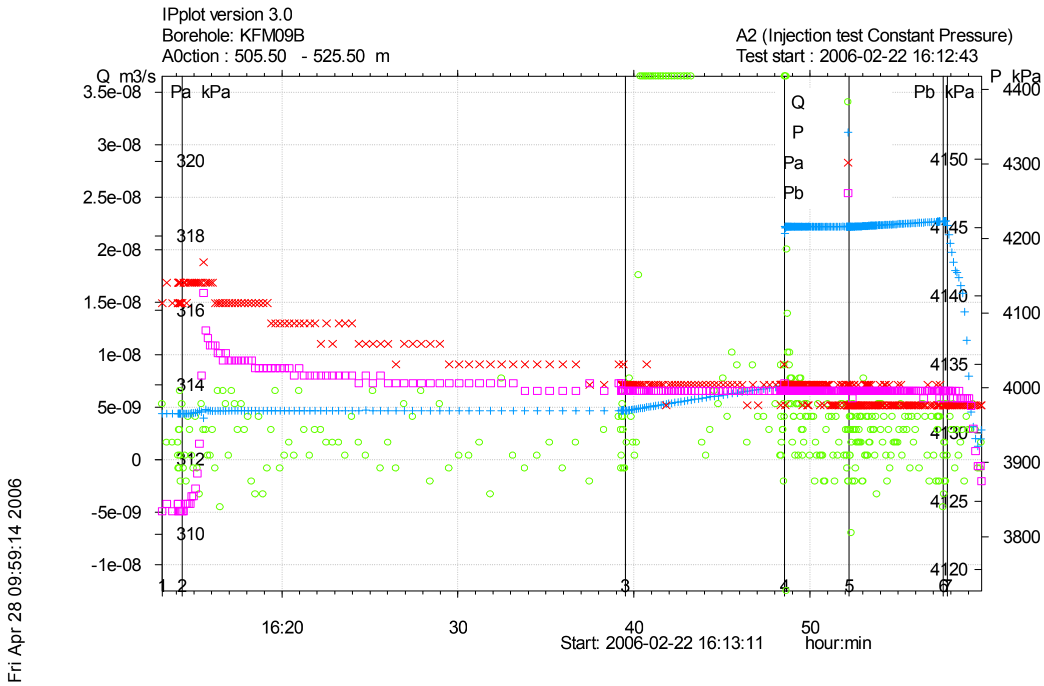


Figure A3-124. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 505.5-525.5 m in borehole KFM09B.*

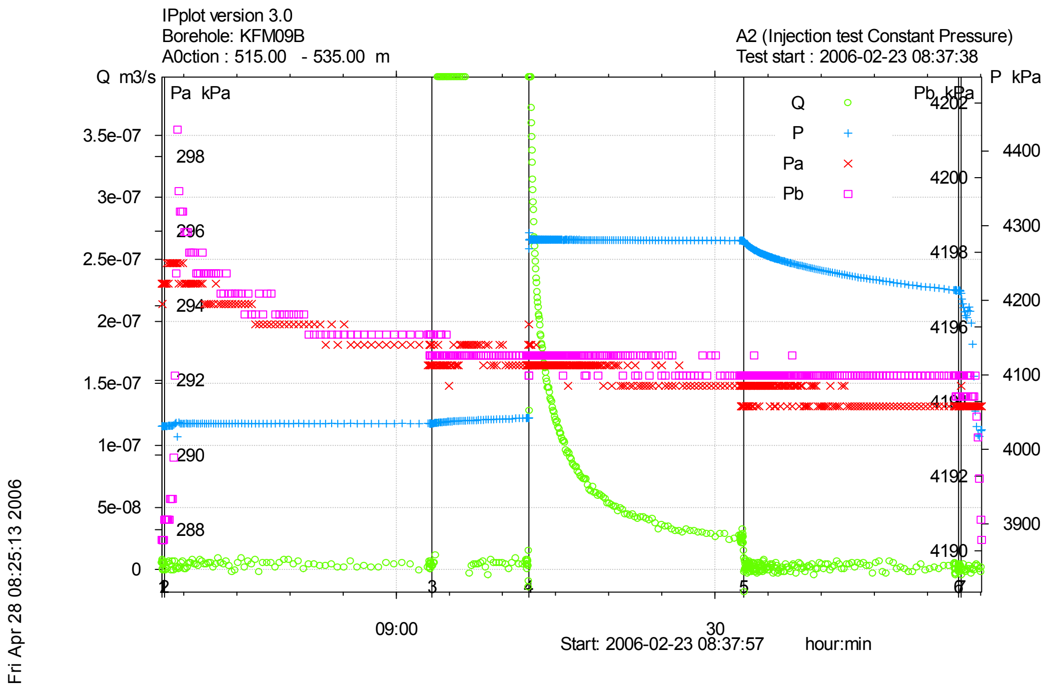


Figure A3-125. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 515.0-535.0 m in borehole KFM09B.*

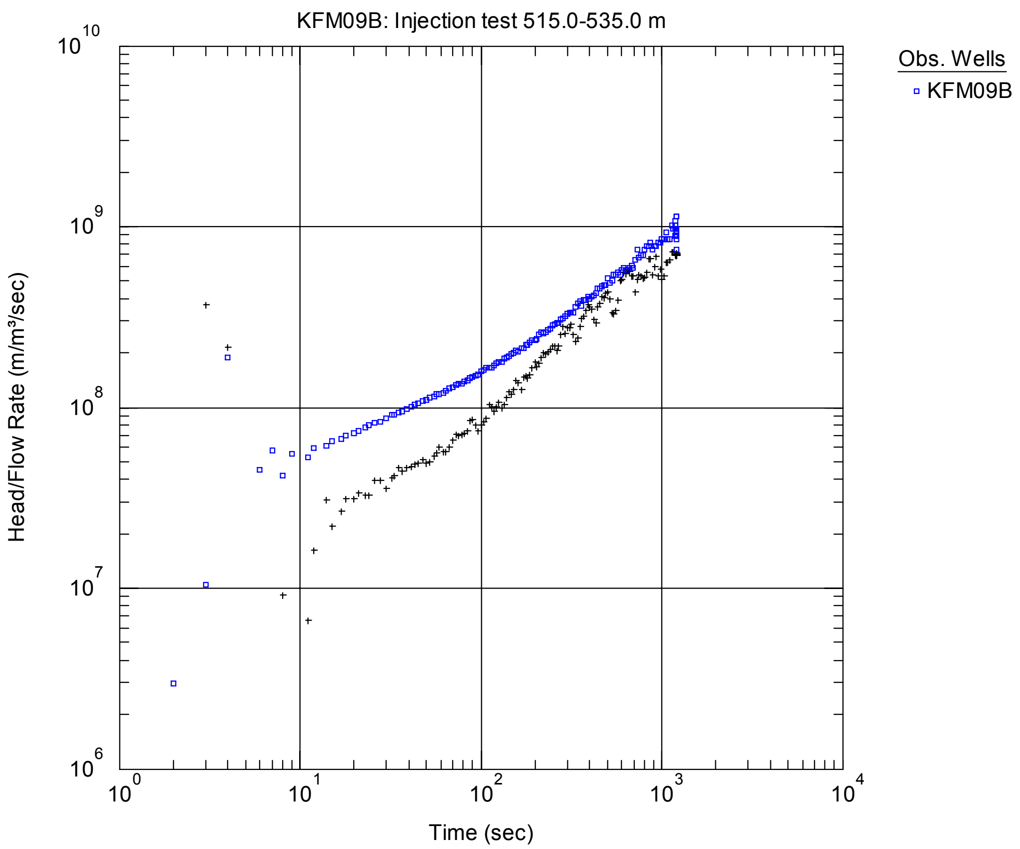


Figure A3-126. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 515.0-535.0 m in KFM09B.*

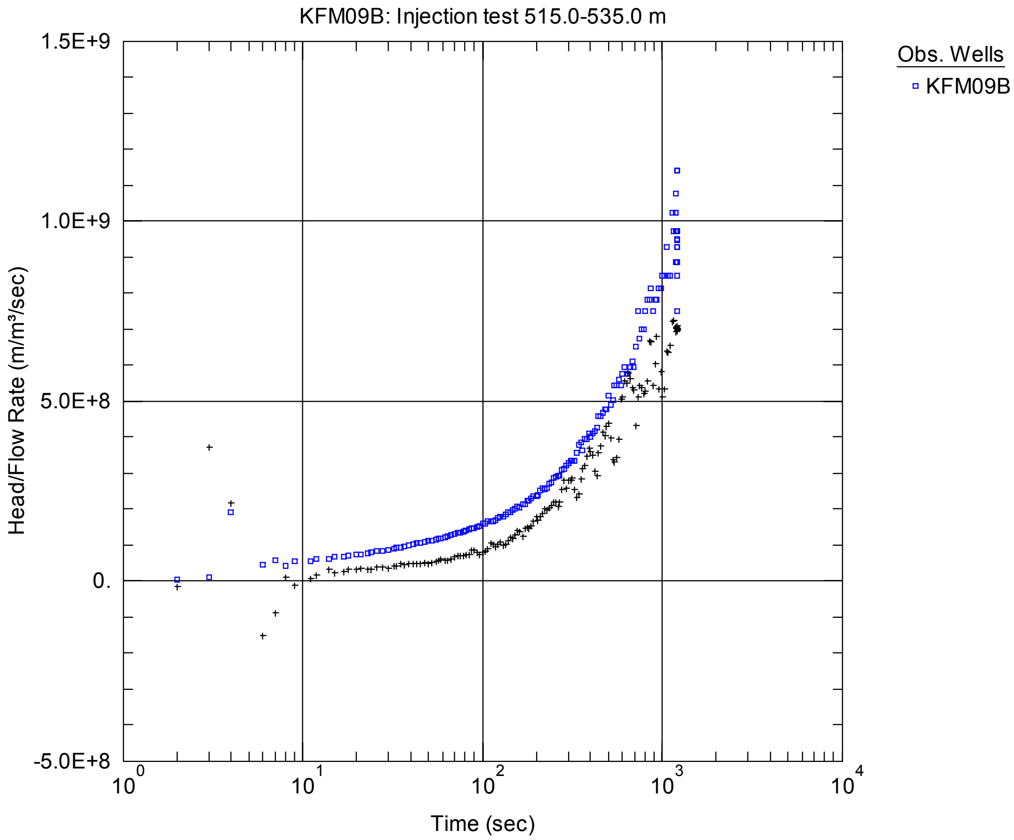


Figure A3-127. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 515.0-535.0 m in KFM09B.*

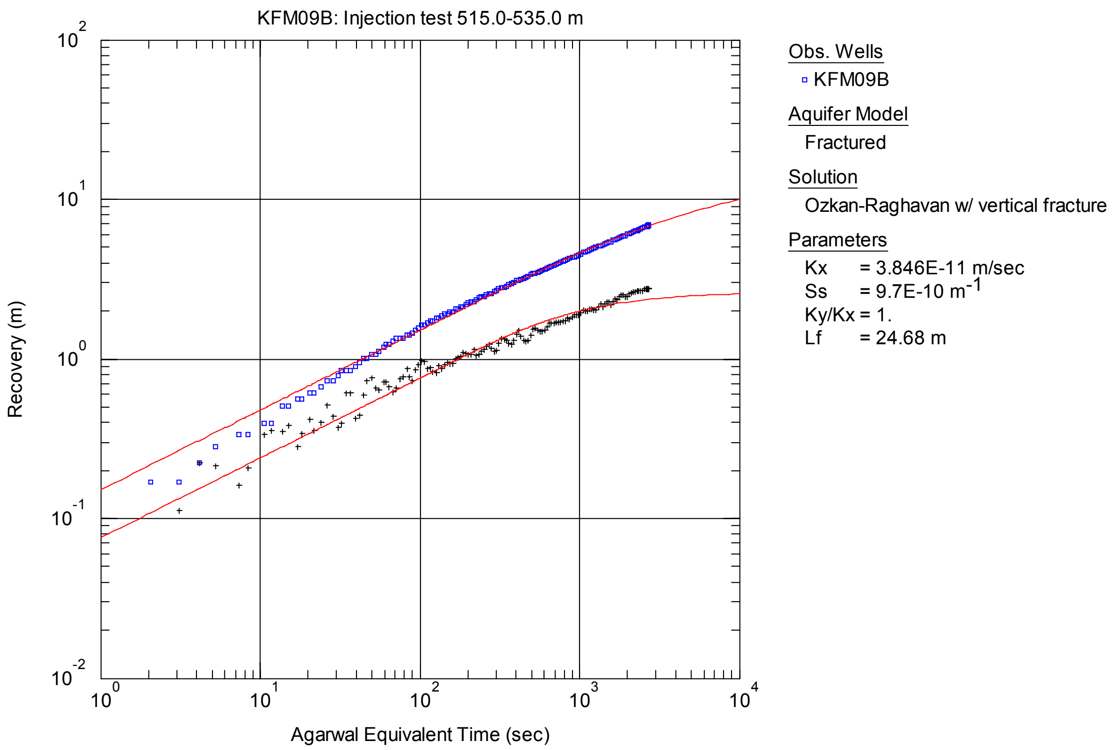


Figure A3-128. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 515.0-535.0 m in KFM09B.*

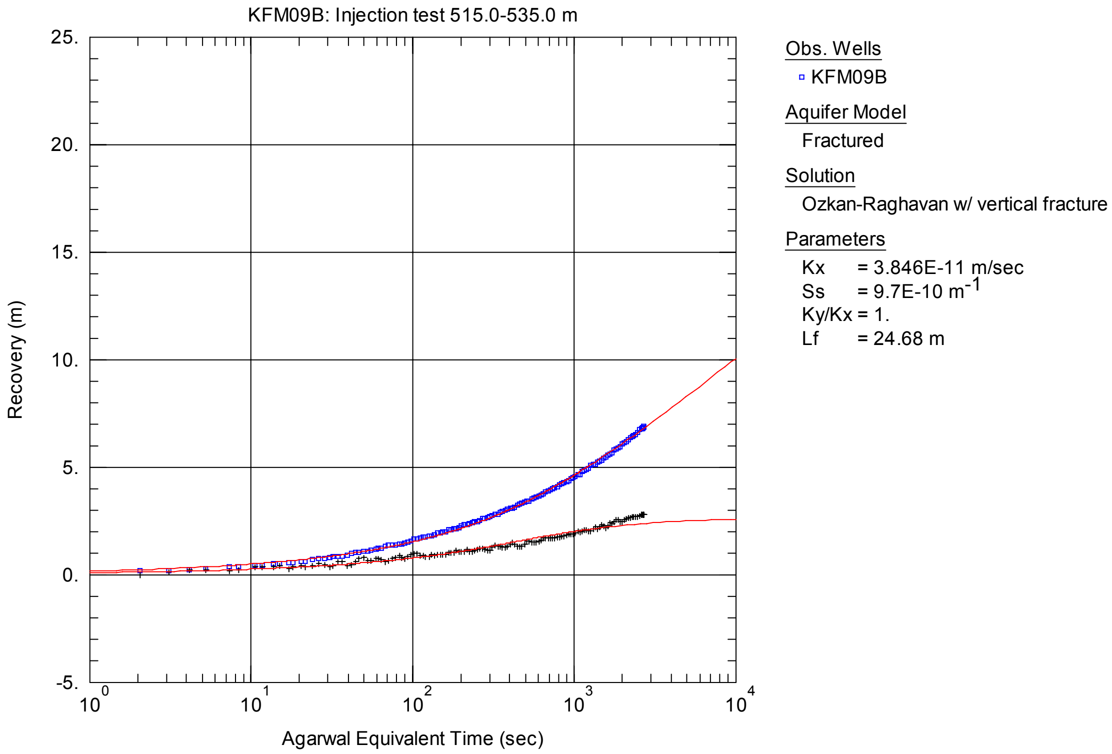


***Figure A3-129.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 515.0-535.0 m in KFM09B.*

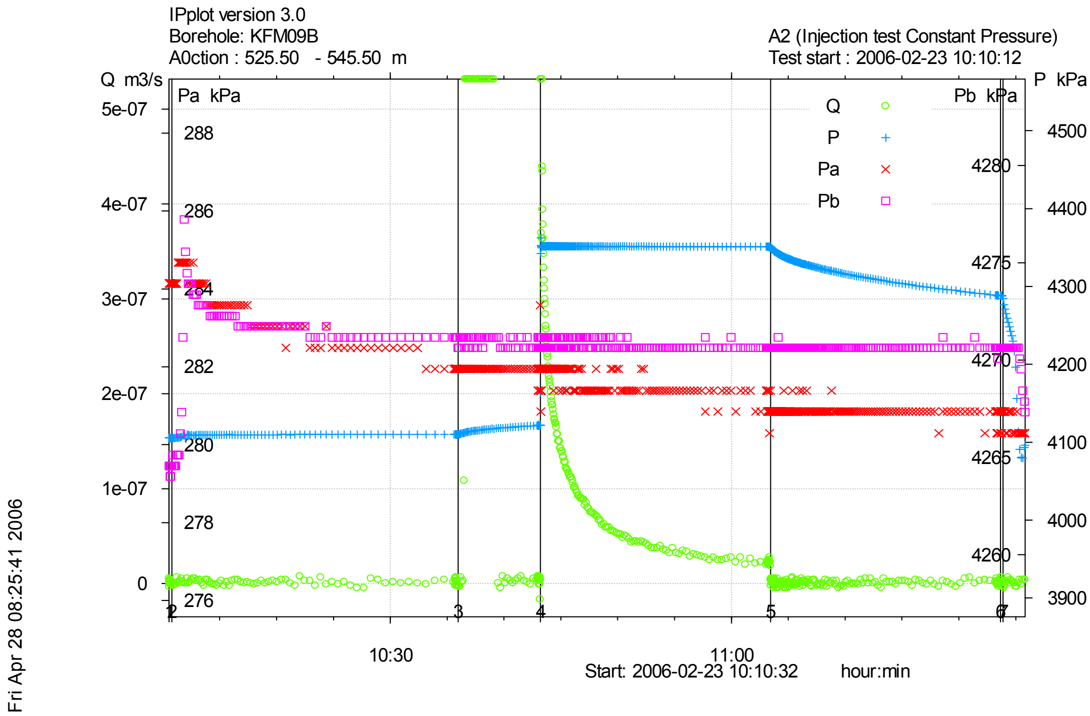


***Figure A3-130.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 525.5-545.5 m in borehole KFM09B.*

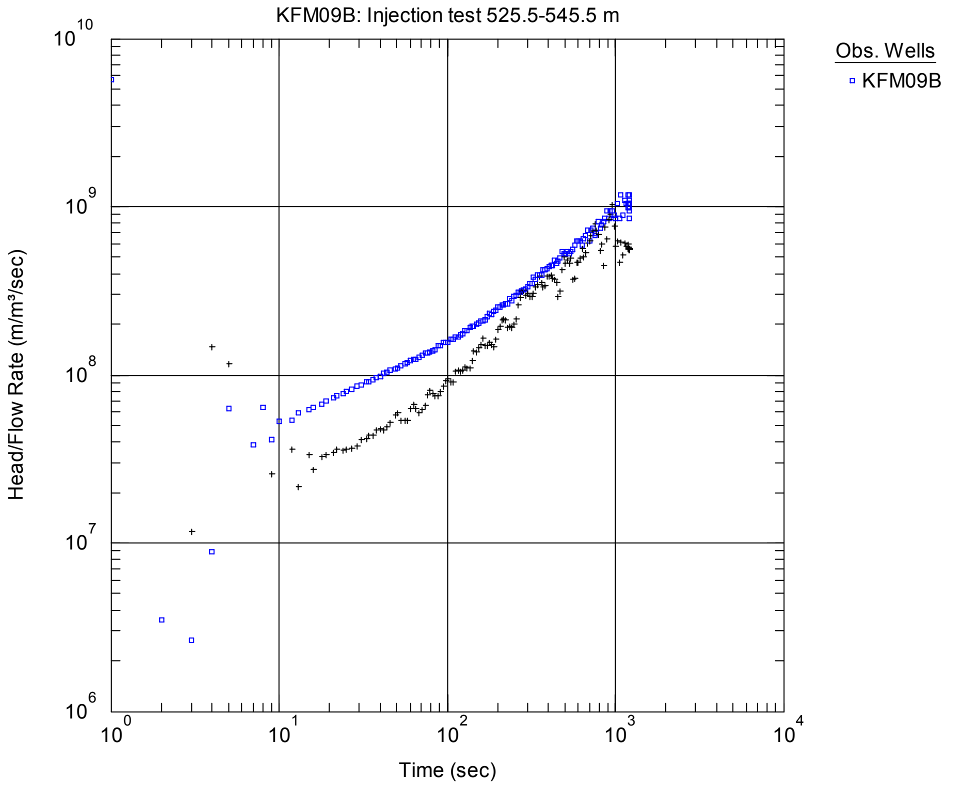


Figure A3-131. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 525.5-545.5 m in KFM09B.*

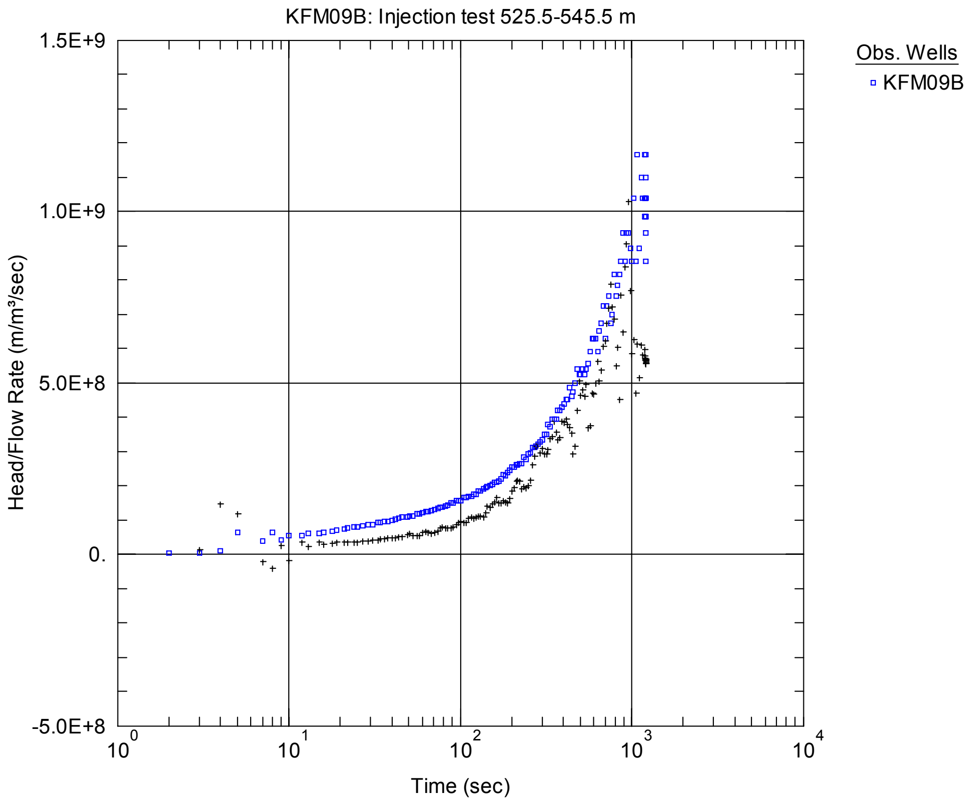


Figure A3-132. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 525.5-545.5 m in KFM09B.*

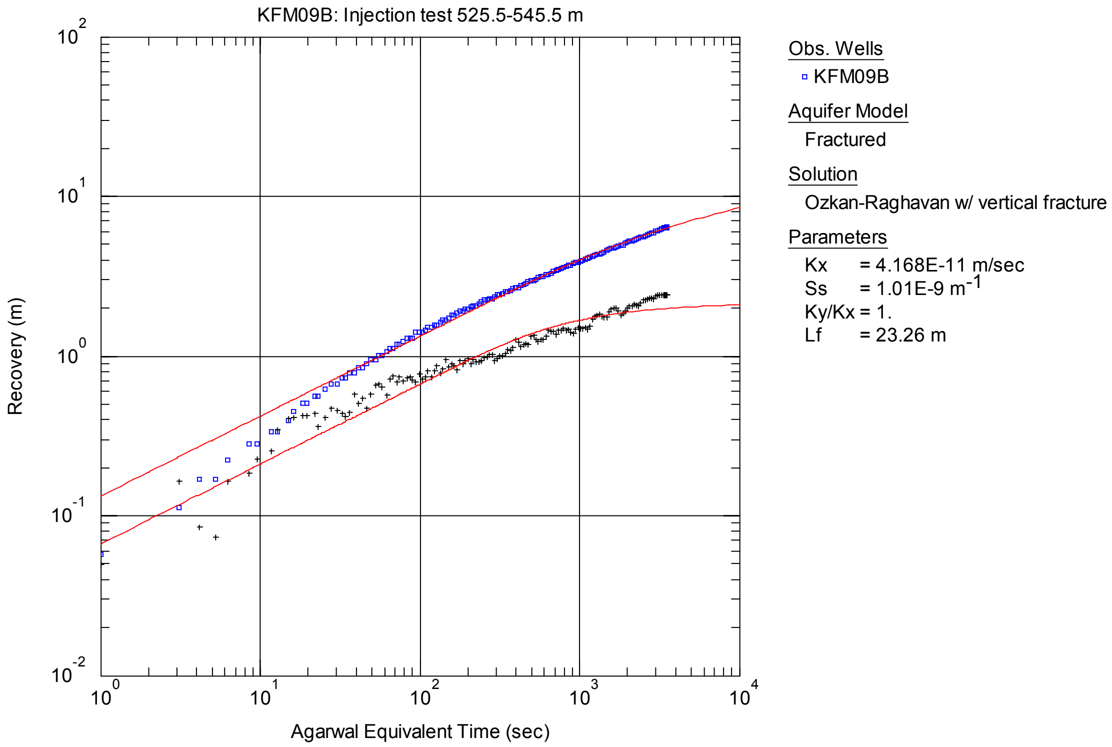


Figure A3-133. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 525.5-545.5 m in KFM09B.*

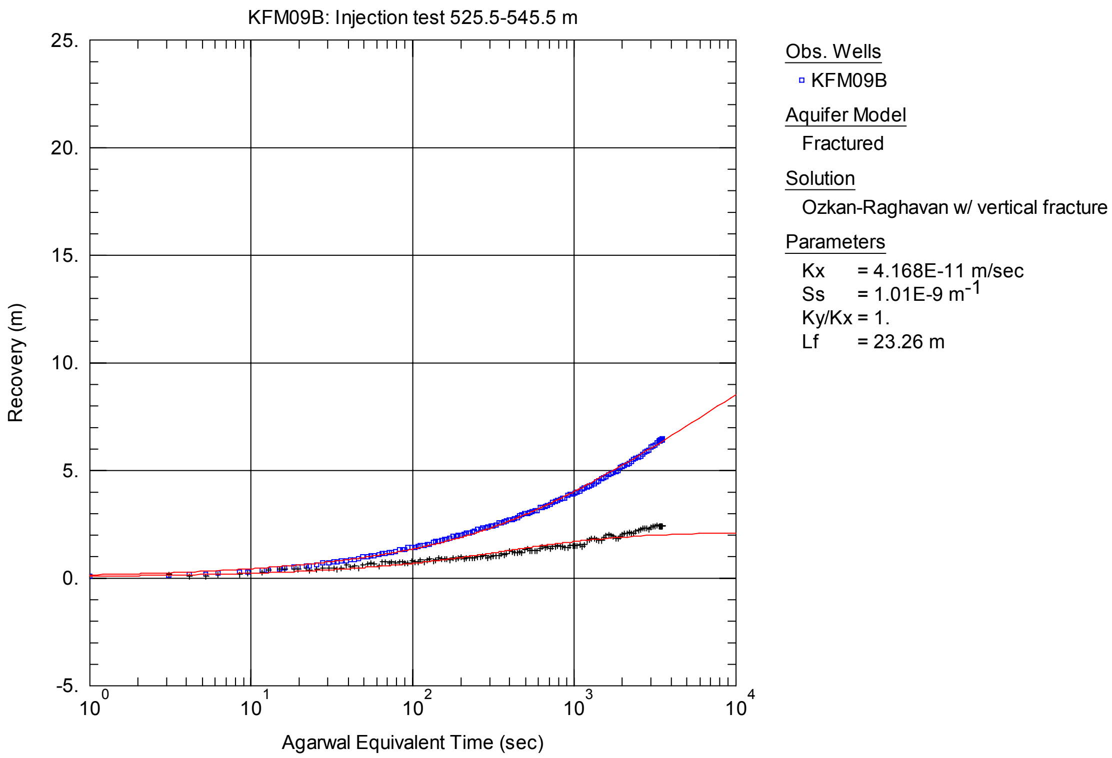


Figure A3-134. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 525.5-545.5 m in KFM09B.*

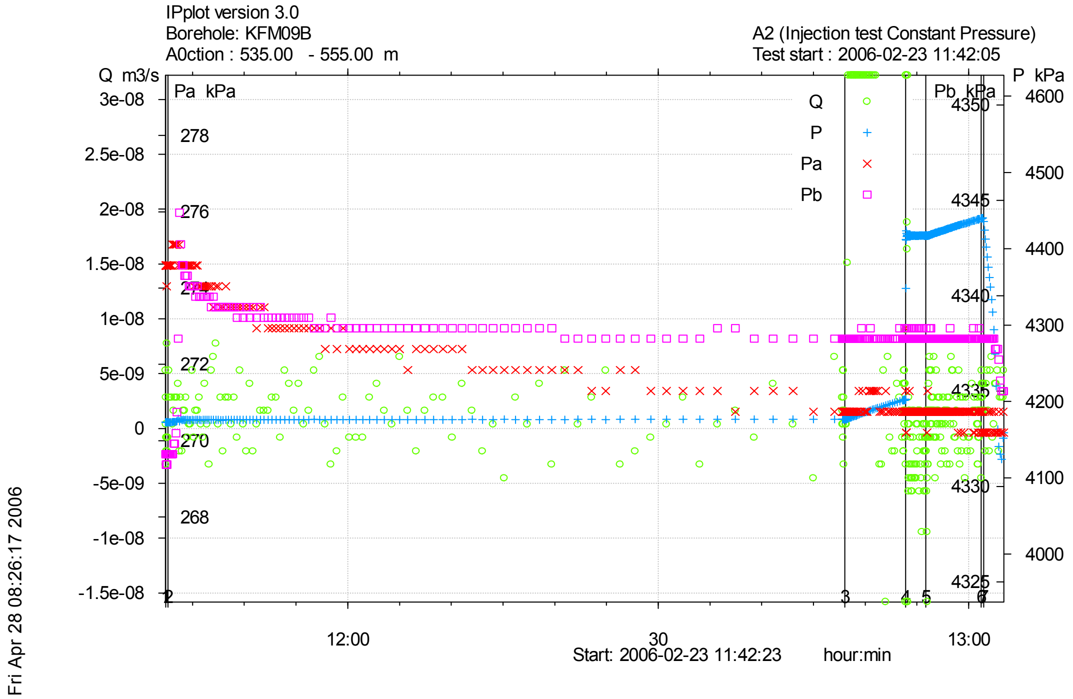


Figure A3-135. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 535.0-555.0 m in borehole KFM09B.*

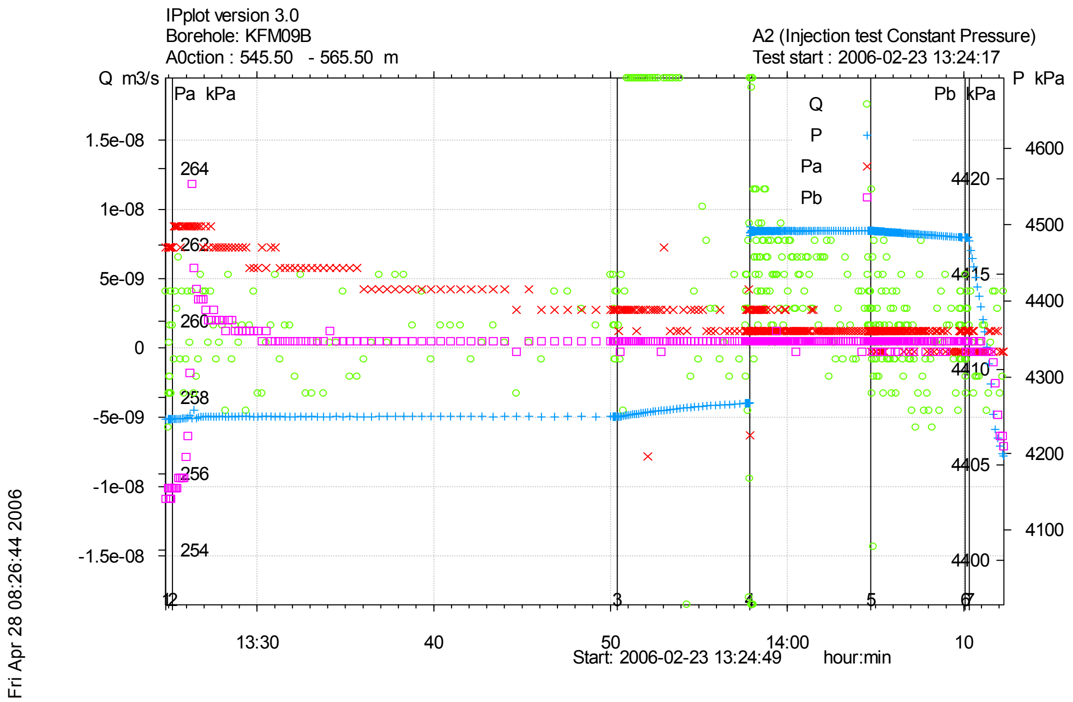


Figure A3-136. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 545.5-565.5 m in borehole KFM09B.*

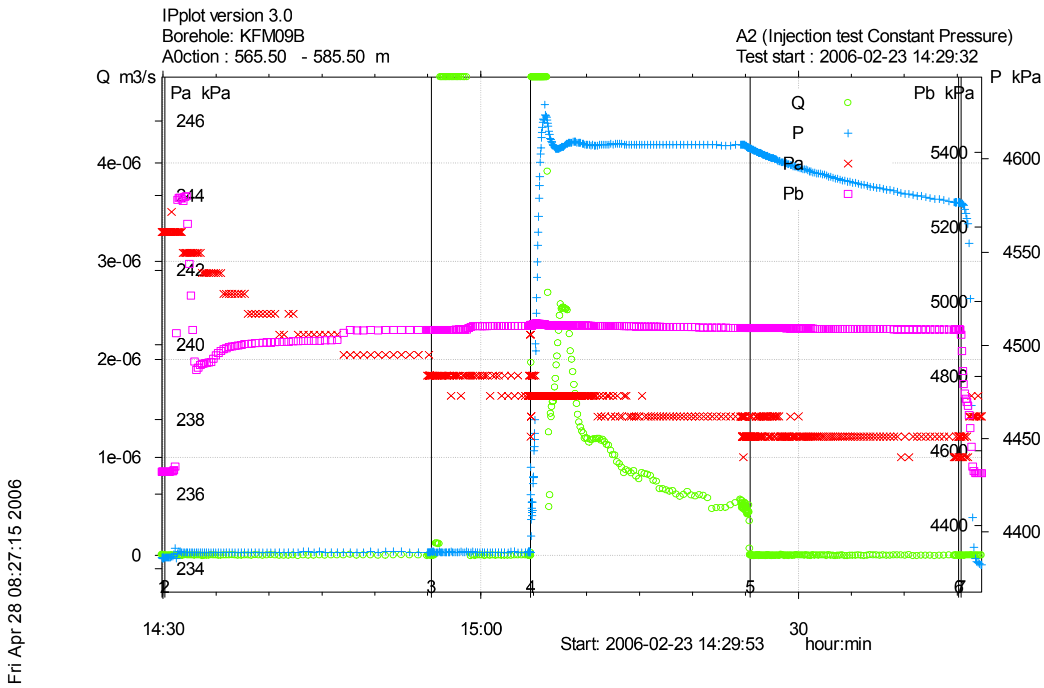


Figure A3-137. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 565.5-585.5 m in borehole KFM09B.

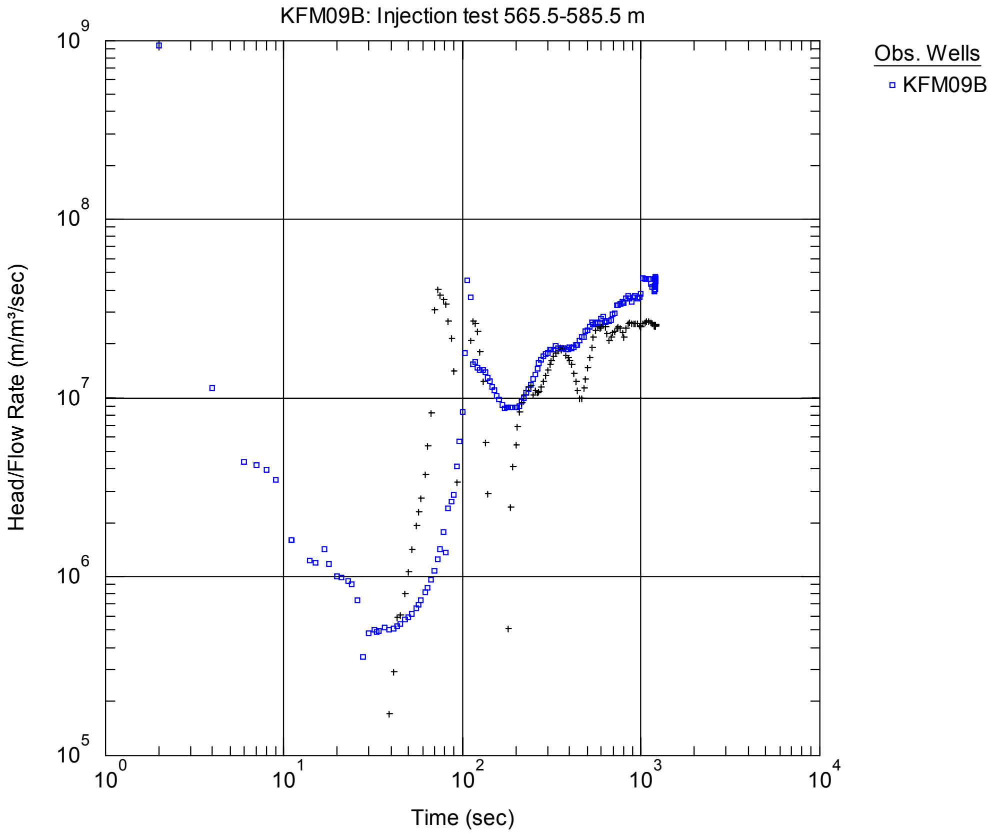


Figure A3-138. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 565.5-585.5 m in KFM09B.

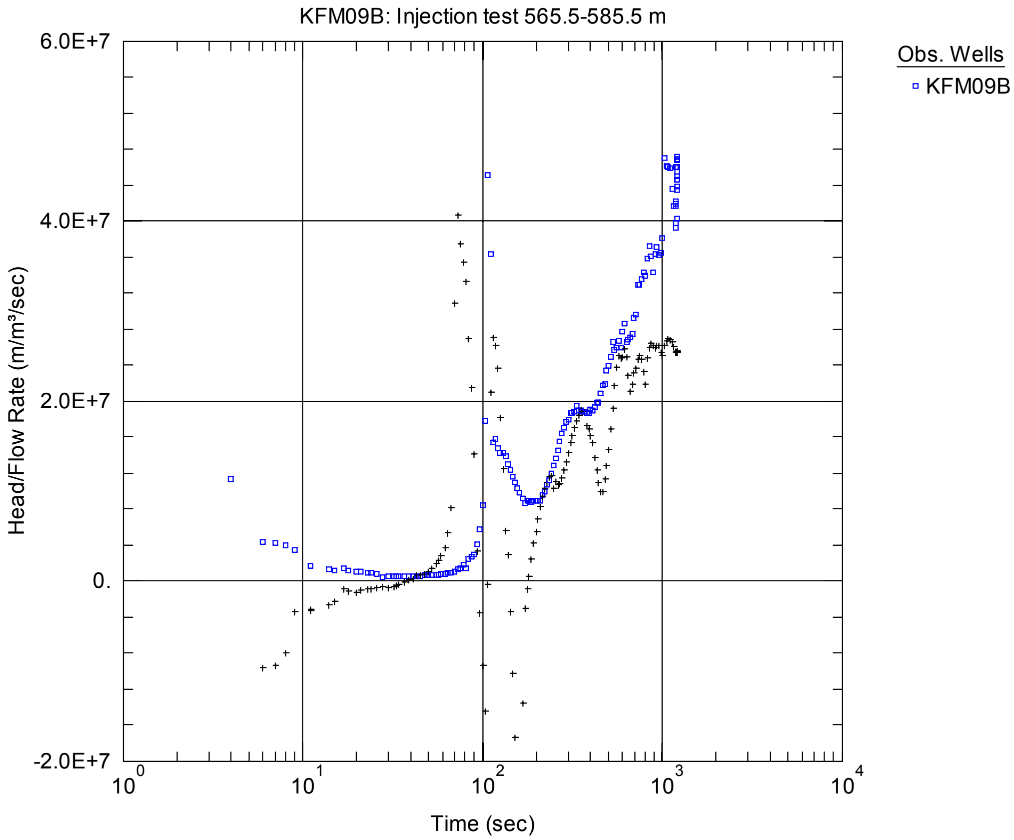


Figure A3-139. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 565.5-585.5 m in KFM09B.*

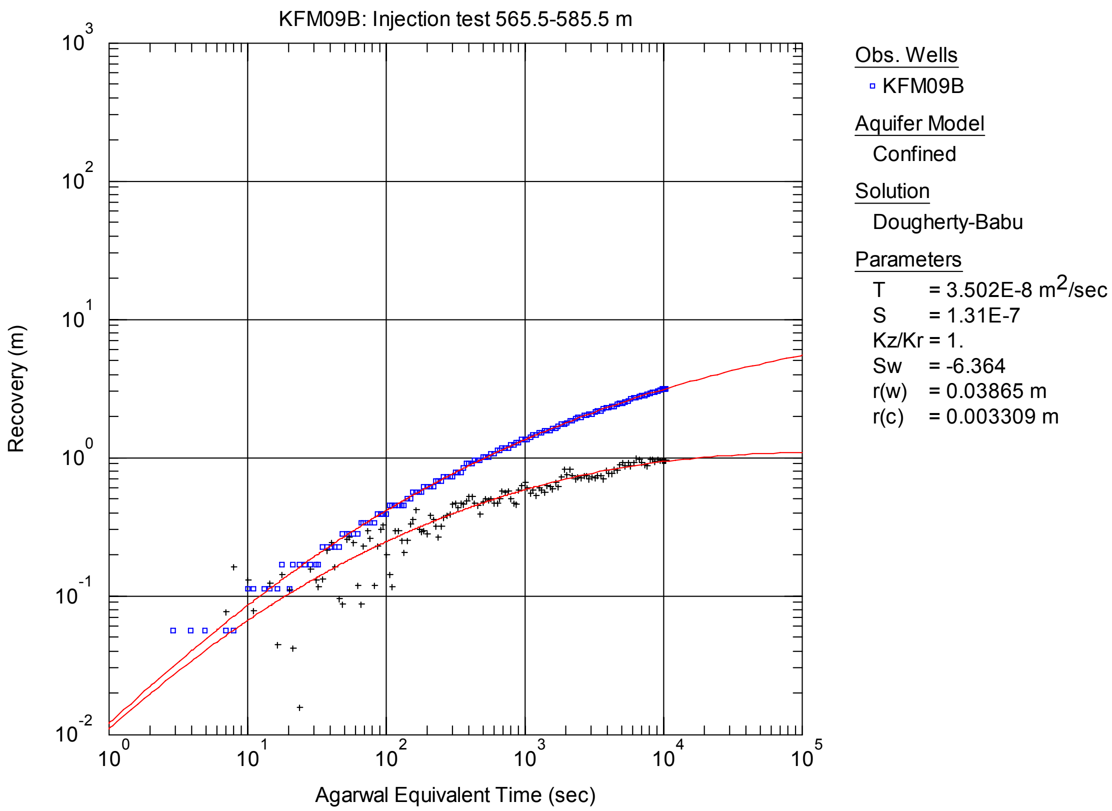


Figure A3-140. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 565.5-585.5 m in KFM09B.*

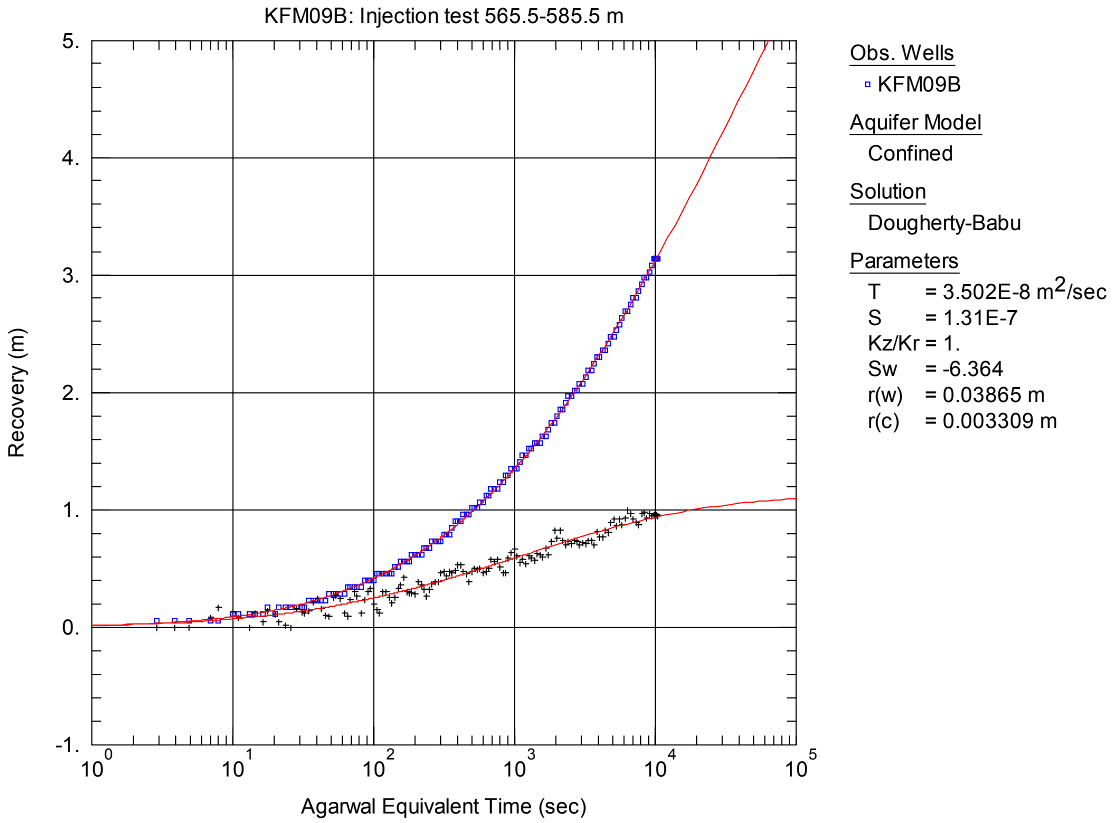


***Figure A3-141.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 565.5-585.5 m in KFM09B.*

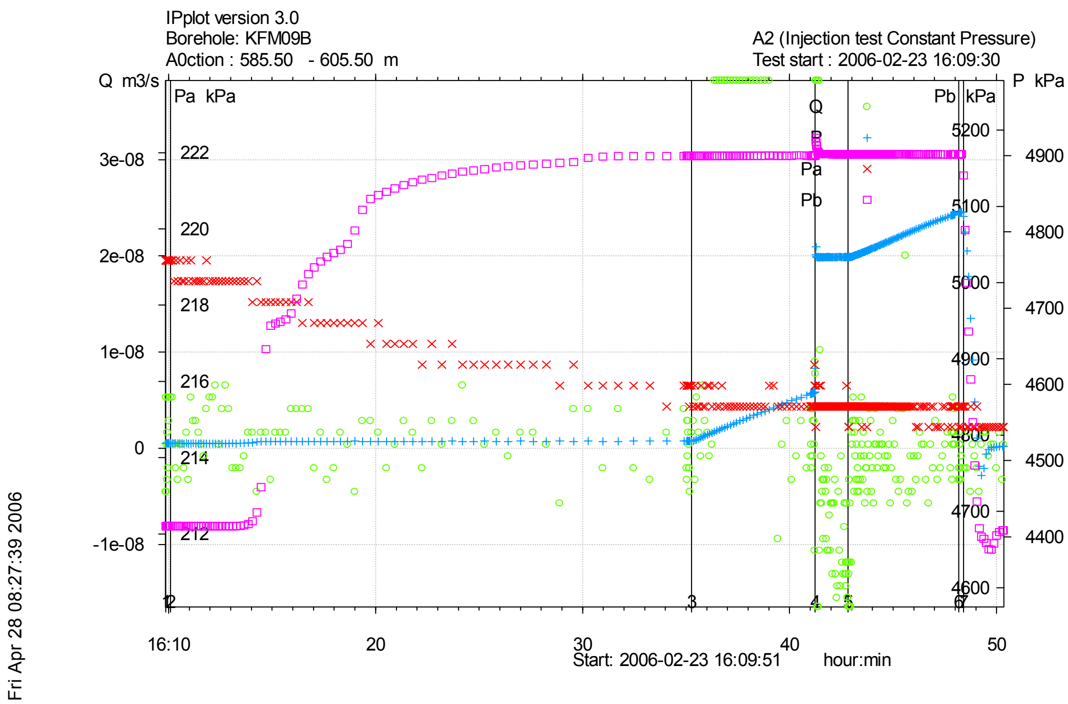


***Figure A3-142.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 585.5-605.5 m in borehole KFM09B.*

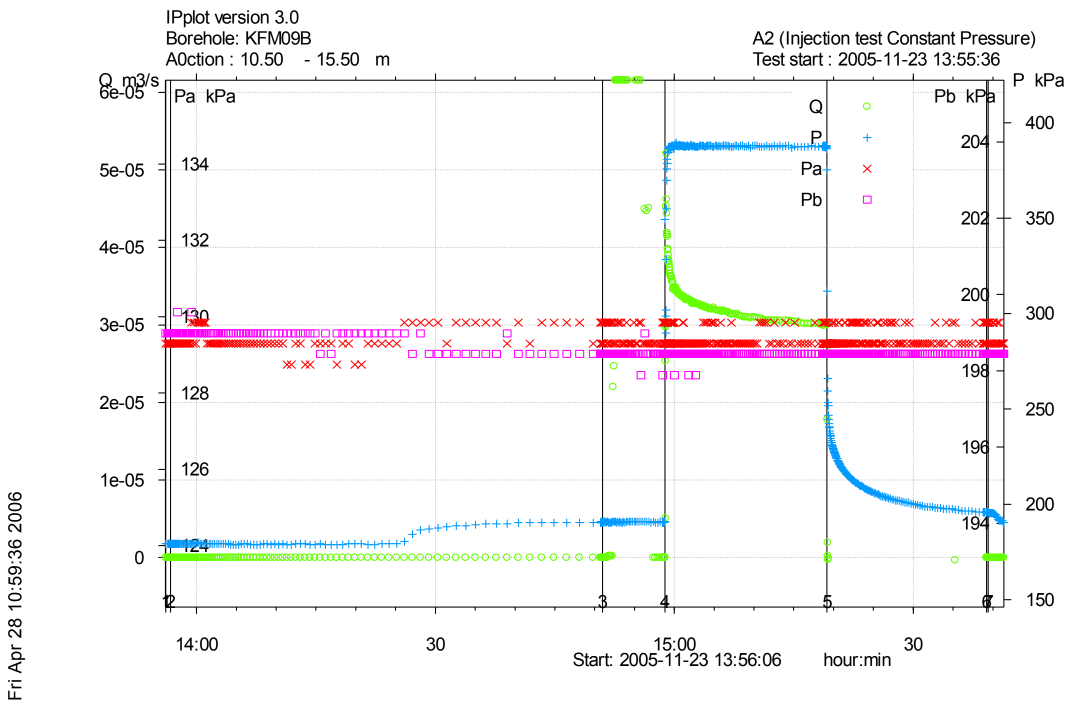


Figure A3-143. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 10.5-15.5 m in borehole KFM09B.

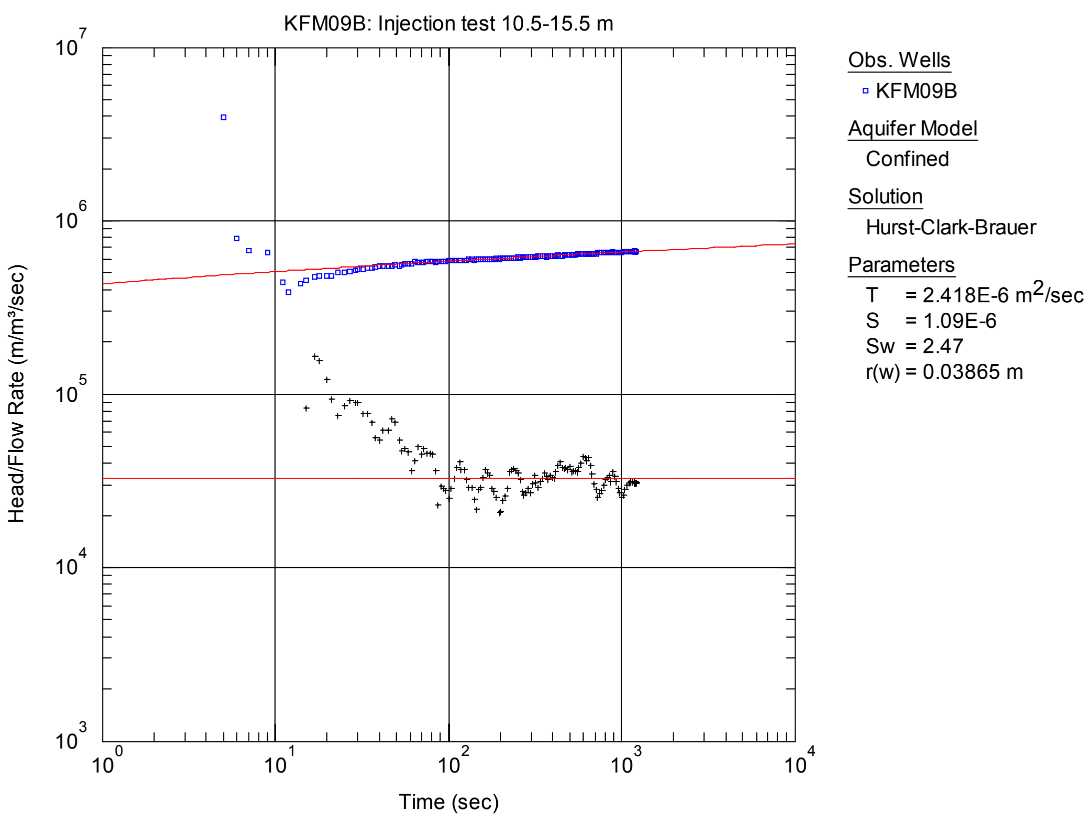


Figure A3-144. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 10.5-15.5 m in KFM09B.

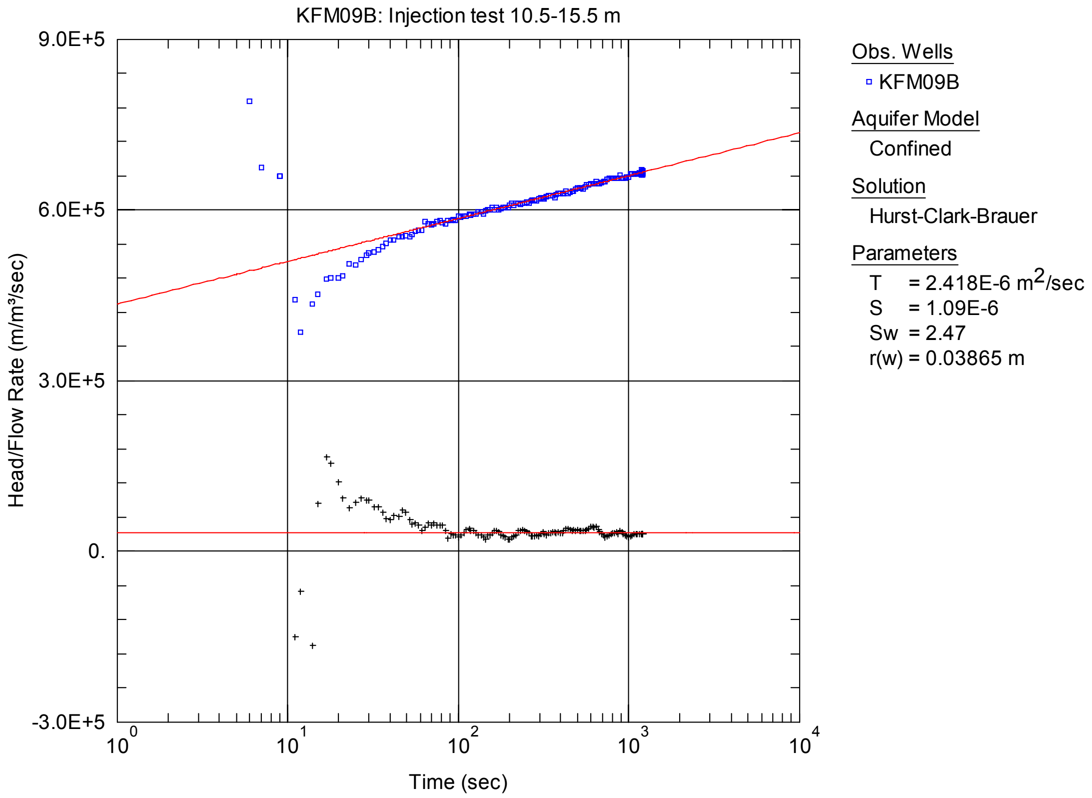


Figure A3-145. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 10.5-15.5 m in KFM09B.*

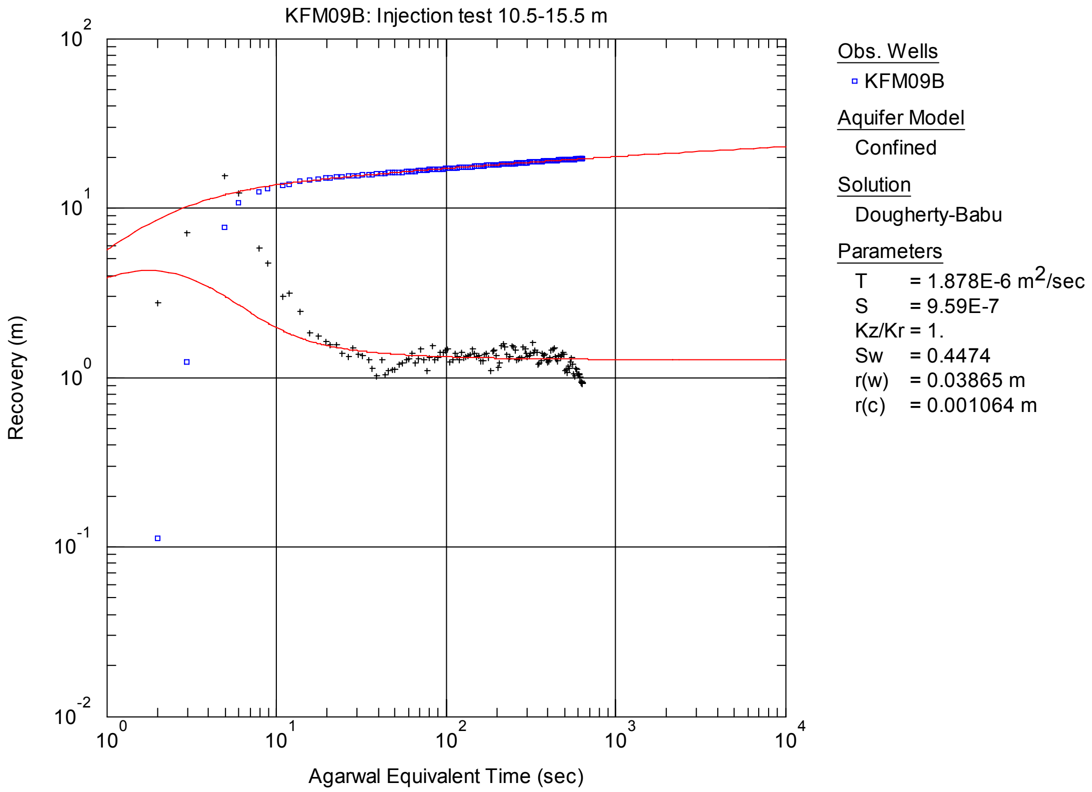


Figure A3-146. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 10.5-15.5 m in KFM09B.*

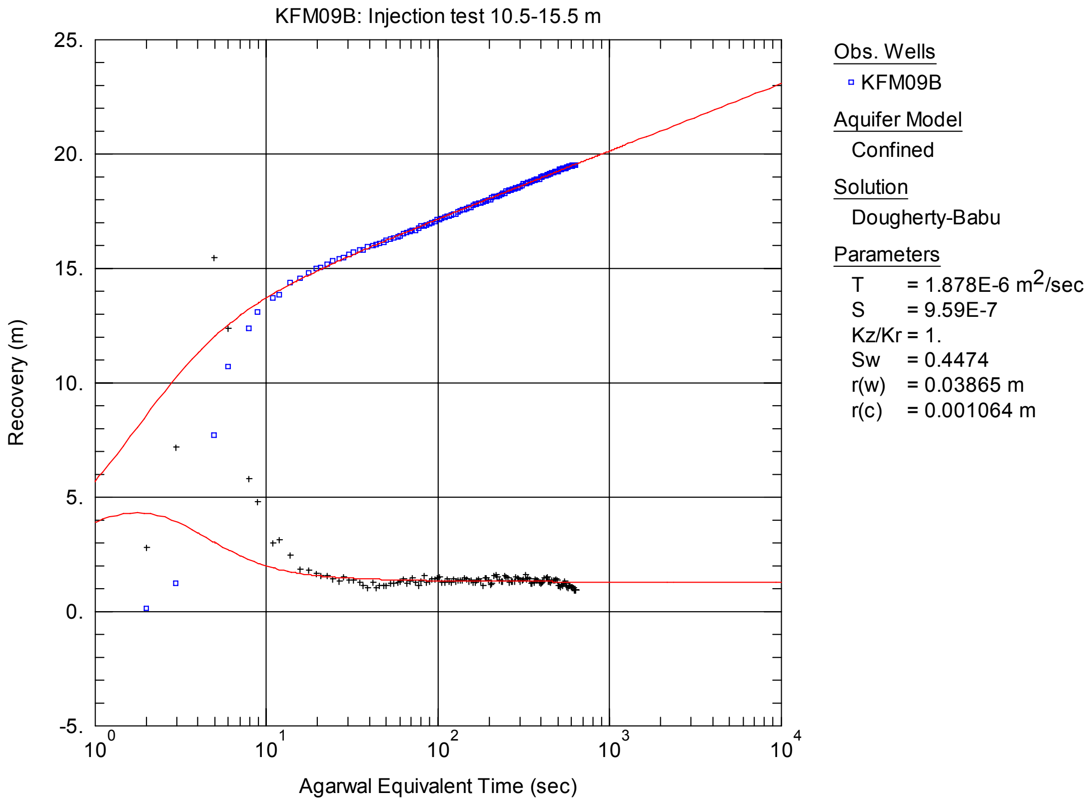


Figure A3-147. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 10.5-15.5 m in KFM09B.*

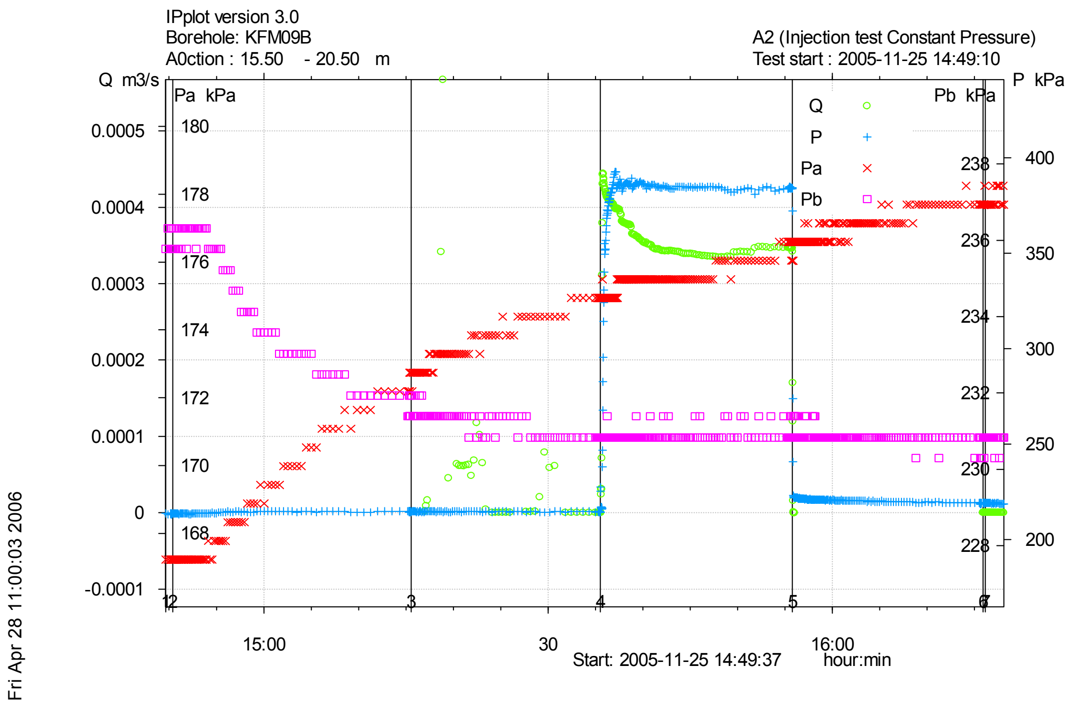


Figure A3-148. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 15.5-20.5 m in borehole KFM09B.*

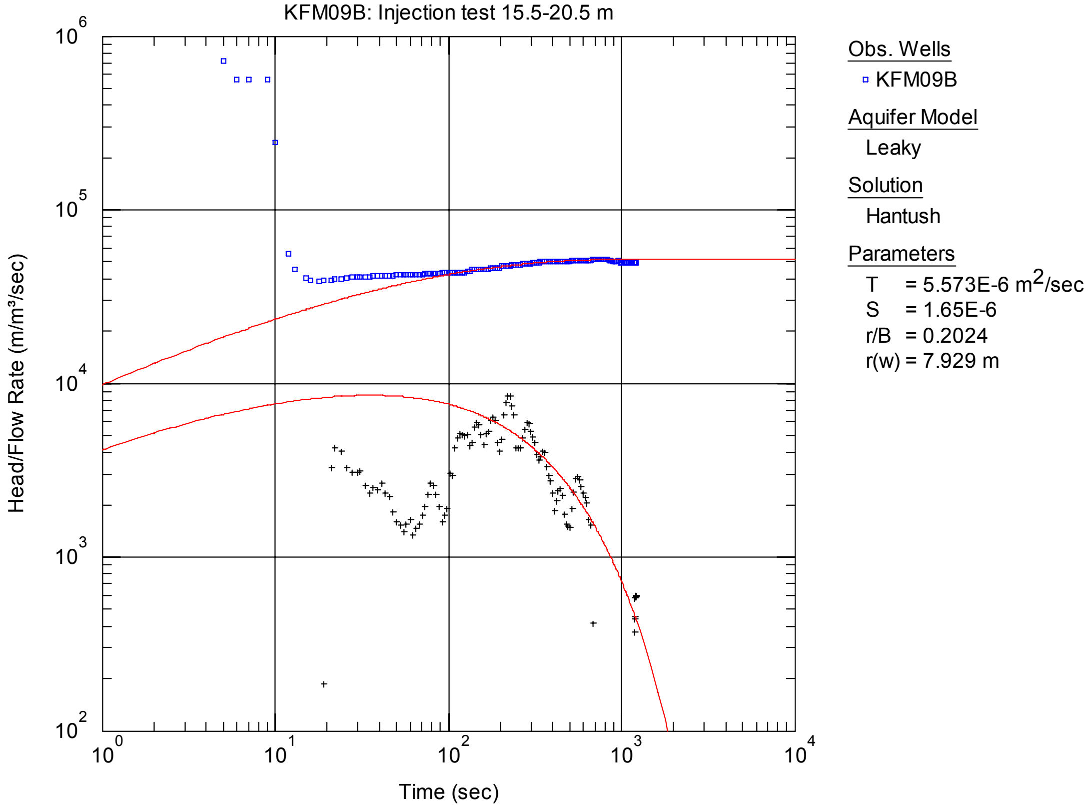


Figure A3-149. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 15.5-20.5 m in KFM09B.*

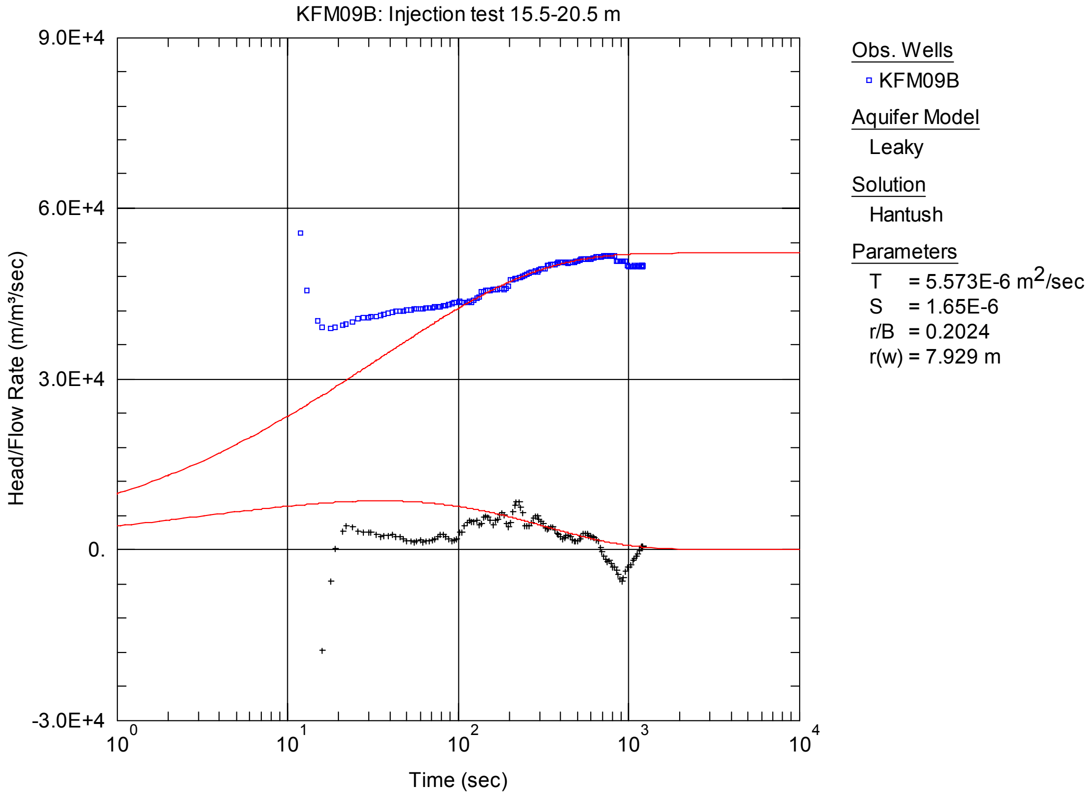


Figure A3-150. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 15.5-20.5 m in KFM09B.*

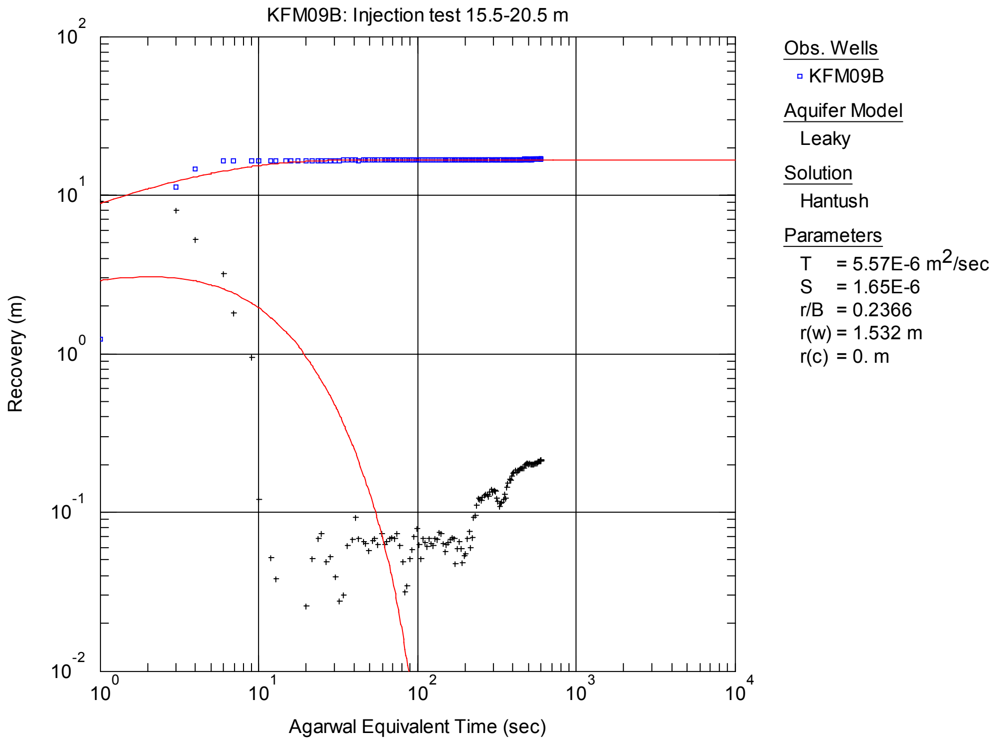


Figure A3-151. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 15.5-20.5 m in KFM09B. No unambiguous transient evaluation was possible for the recovery period. This diagram demonstrates a solution assuming the same values of transmissivity and storativity as were estimated from the injection period.*

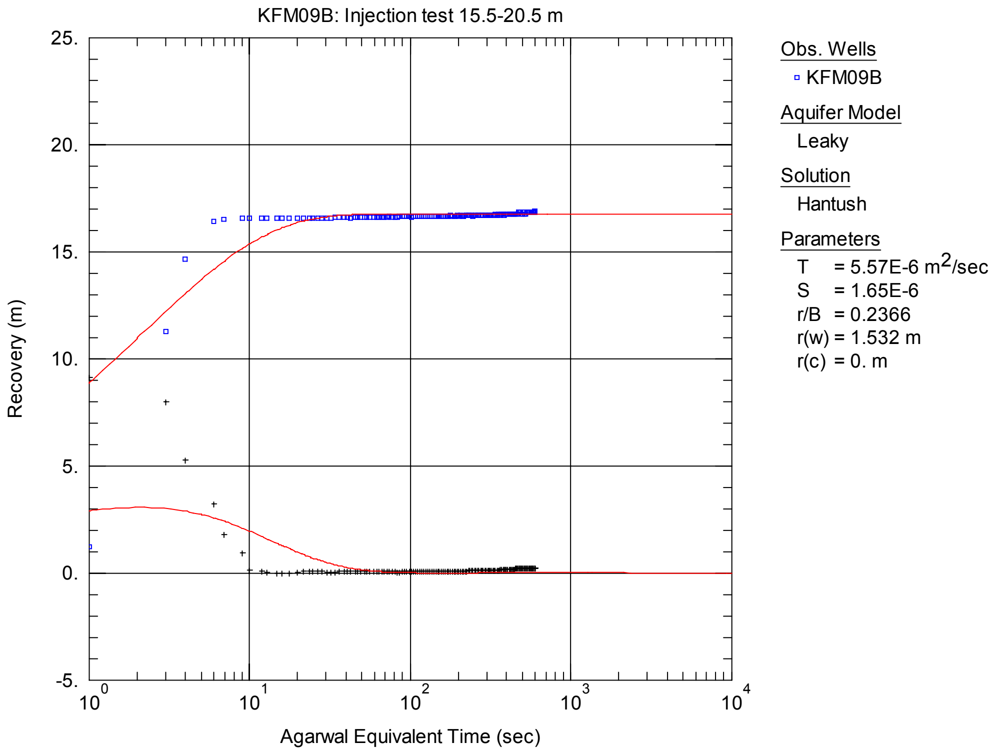


Figure A3-152. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 15.5-20.5 m in KFM09B. No unambiguous transient evaluation was possible for the recovery period. This diagram demonstrates a solution assuming the same values of transmissivity and storativity as were estimated from the injection period.*

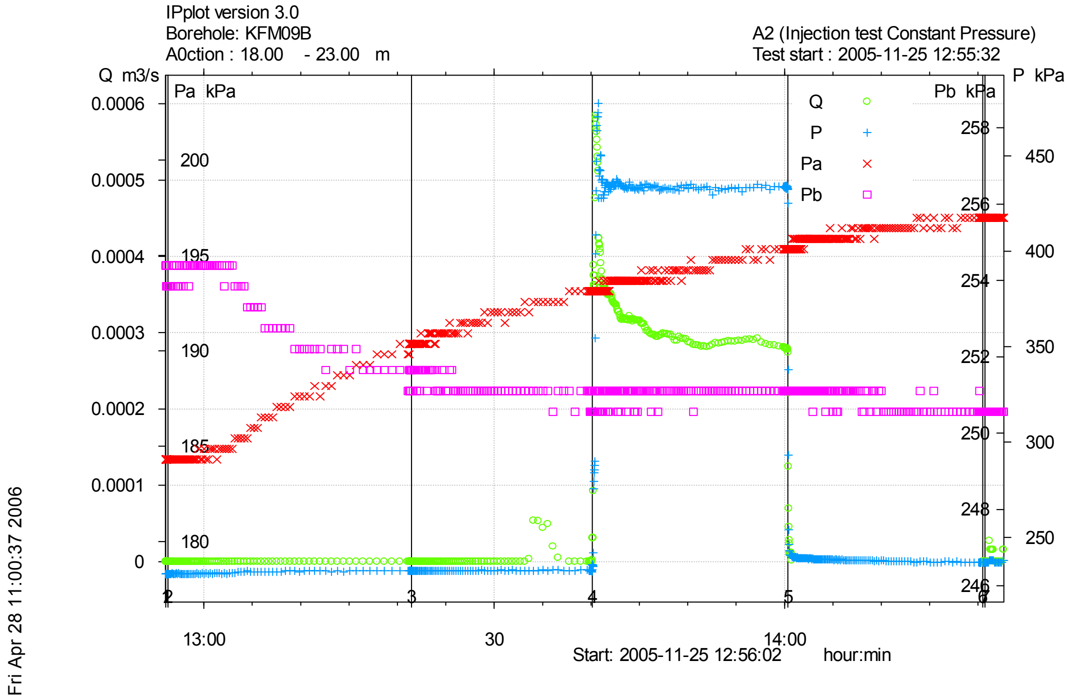


Figure A3-153. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 18.0-23.0 m in borehole KFM09B.

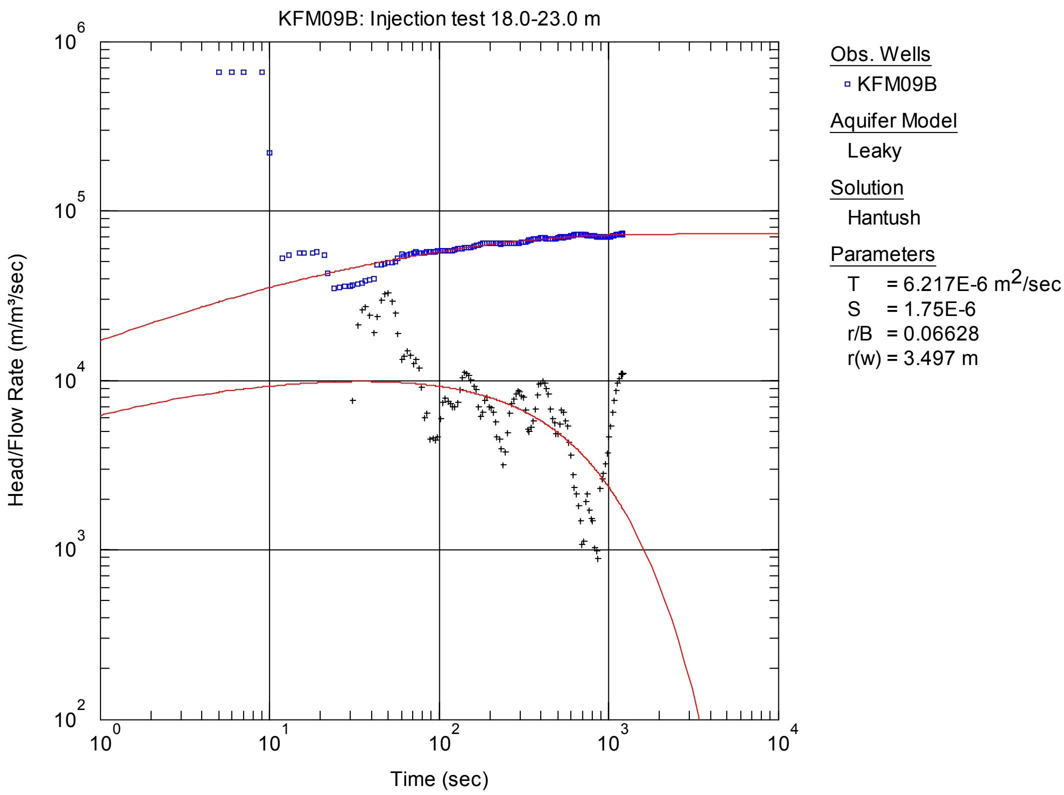


Figure A3-154. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 18.0-23.0 m in KFM09B.

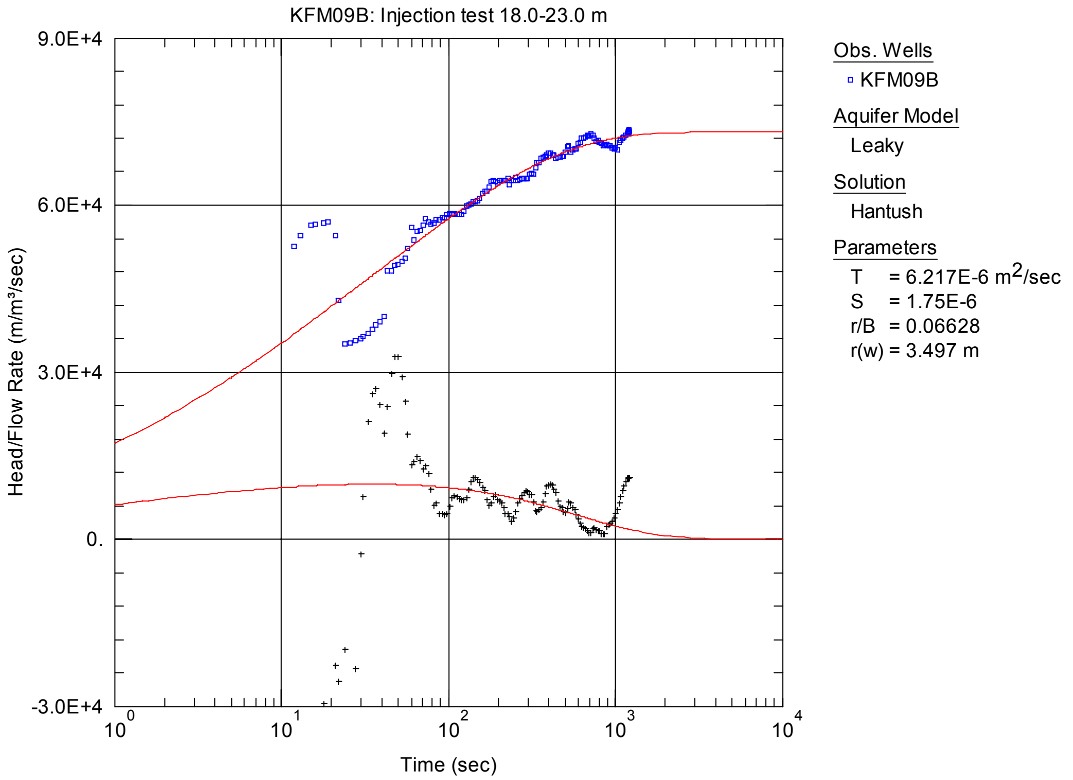


Figure A3-155. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 18.0-23.0 m in KFM09B.*

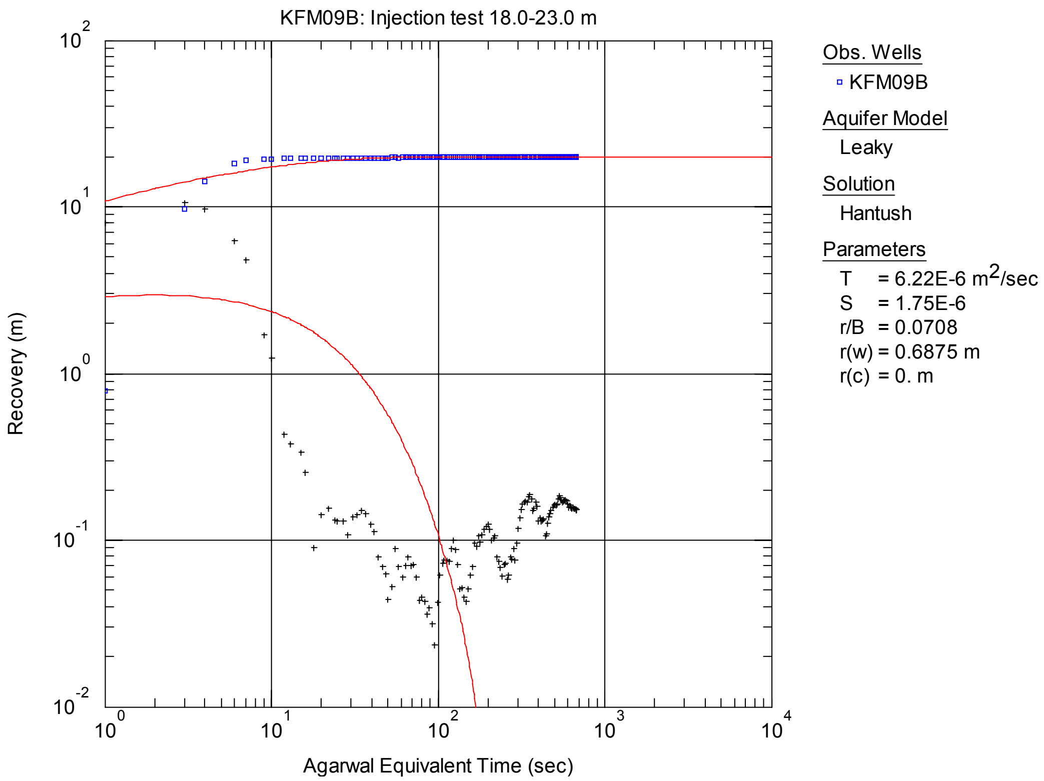


Figure A3-156. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 18.0-23.0 m in KFM09B. No unambiguous transient evaluation was possible for the recovery period. This diagram demonstrates a solution assuming the same values of transmissivity and storativity as were estimated from the injection period.*

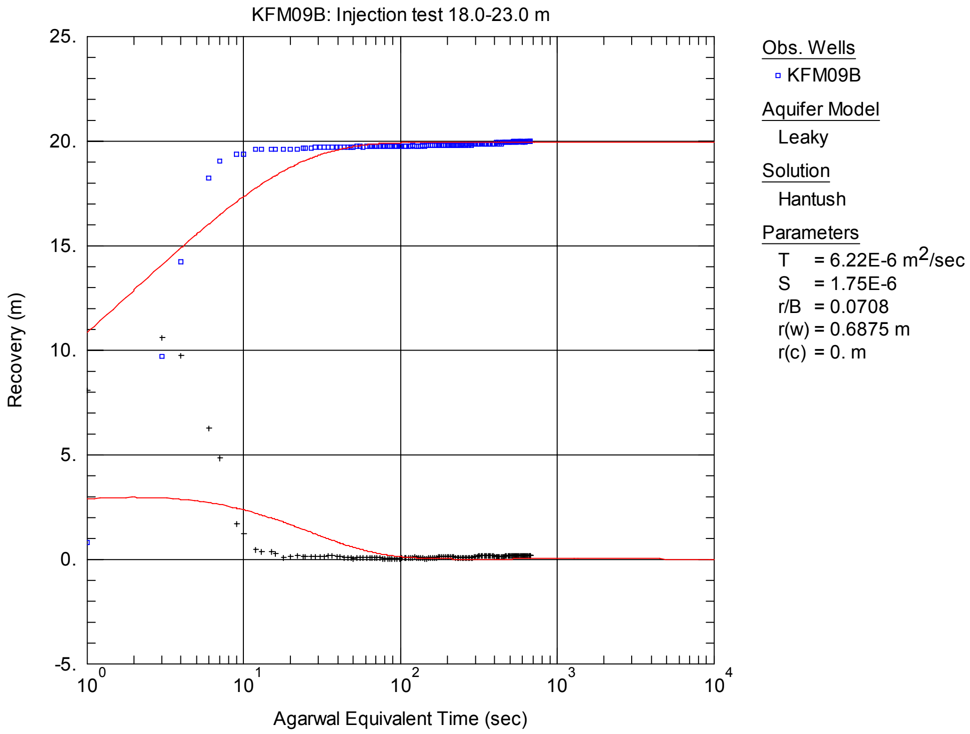


Figure A3-157. Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 18.0-23.0 m in KFM09B. No unambiguous transient evaluation was possible for the recovery period. This diagram demonstrates a solution assuming the same values of transmissivity and storativity as were estimated from the injection period.

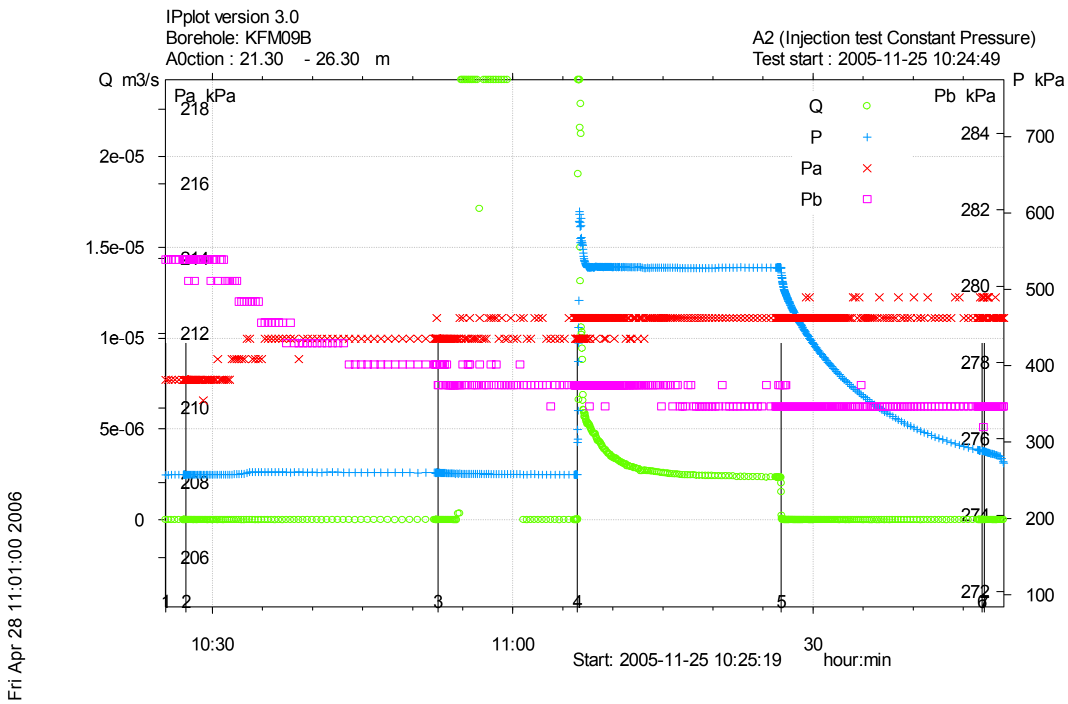


Figure A3-158. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 21.3-26.3 m in borehole KFM09B.

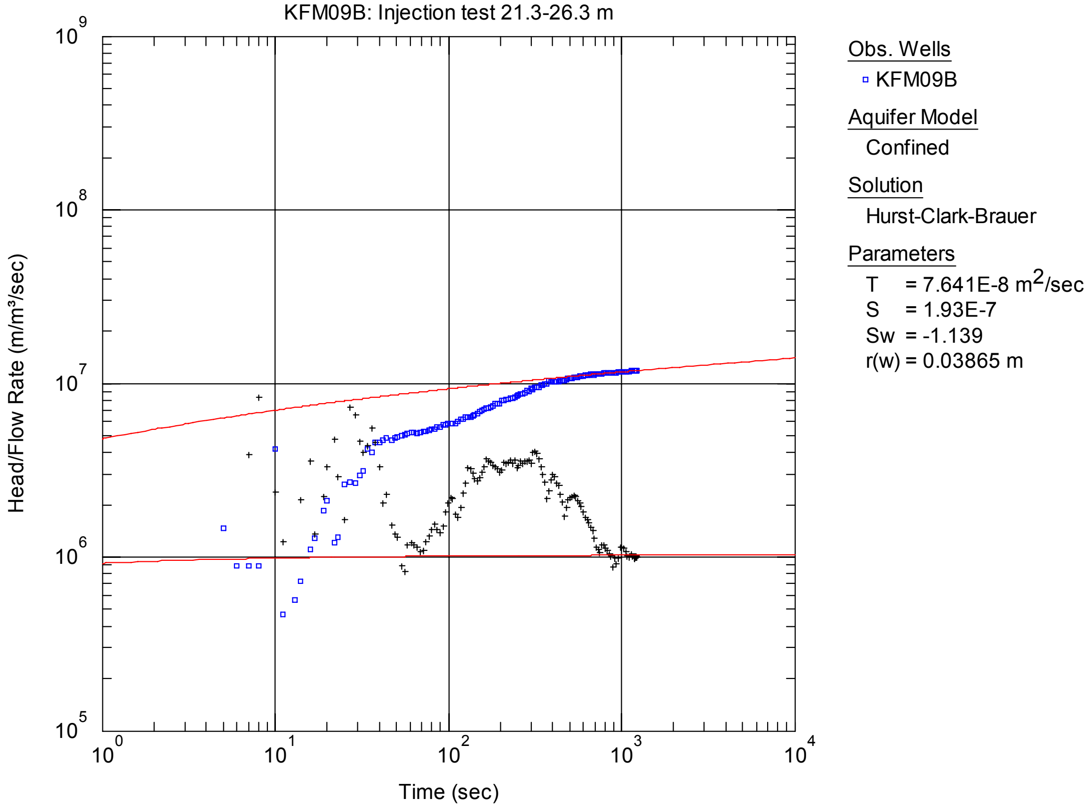


***Figure A3-159.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 21.3-26.3 m in KFM09B.*

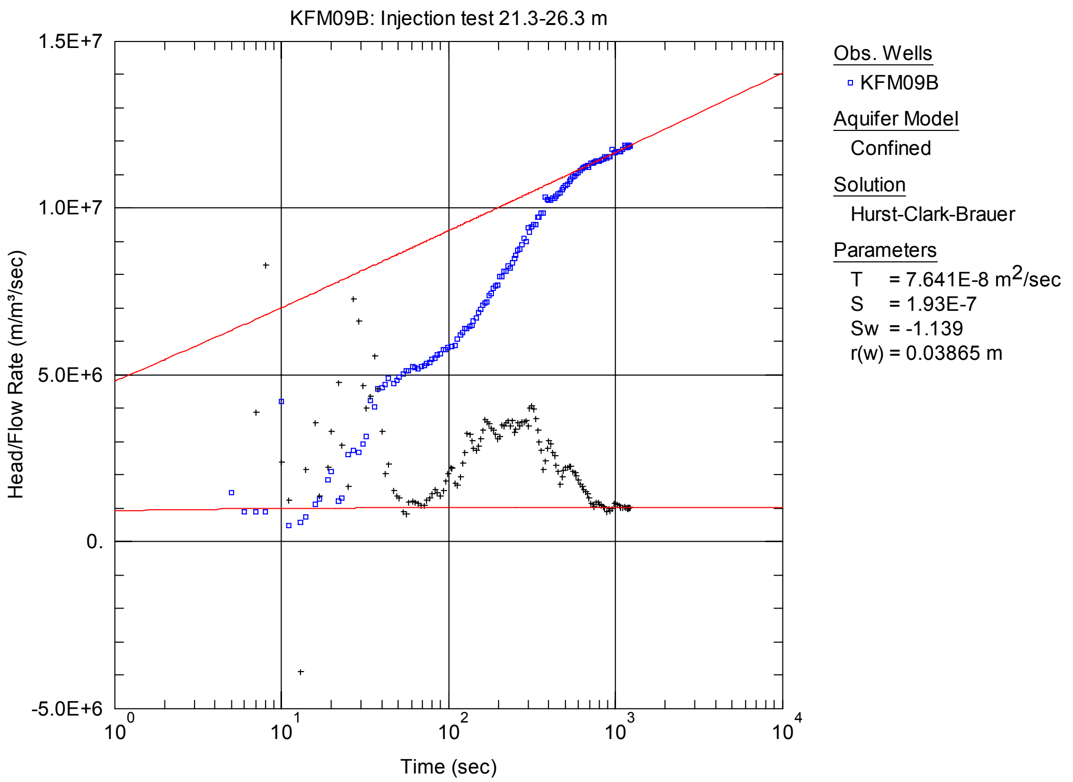


***Figure A3-160.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 21.3-26.3 m in KFM09B.*

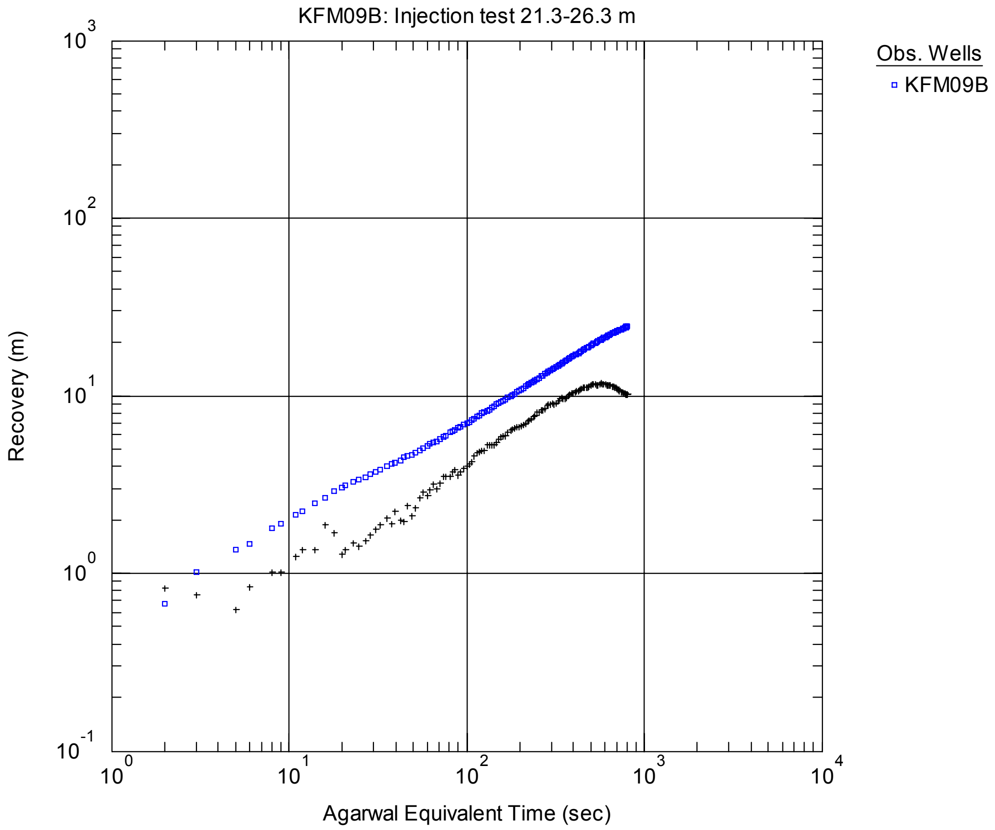


Figure A3-161. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 21.3-26.3 m in KFM09B.*

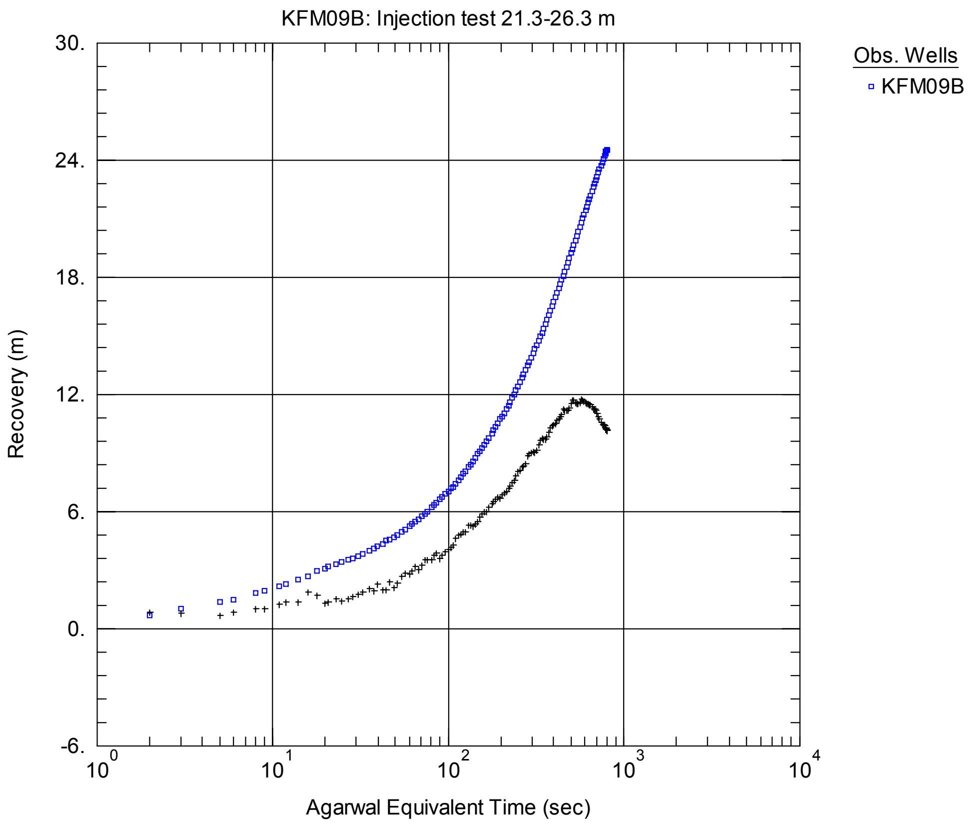


Figure A3-162. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 21.3-26.3 m in KFM09B.*

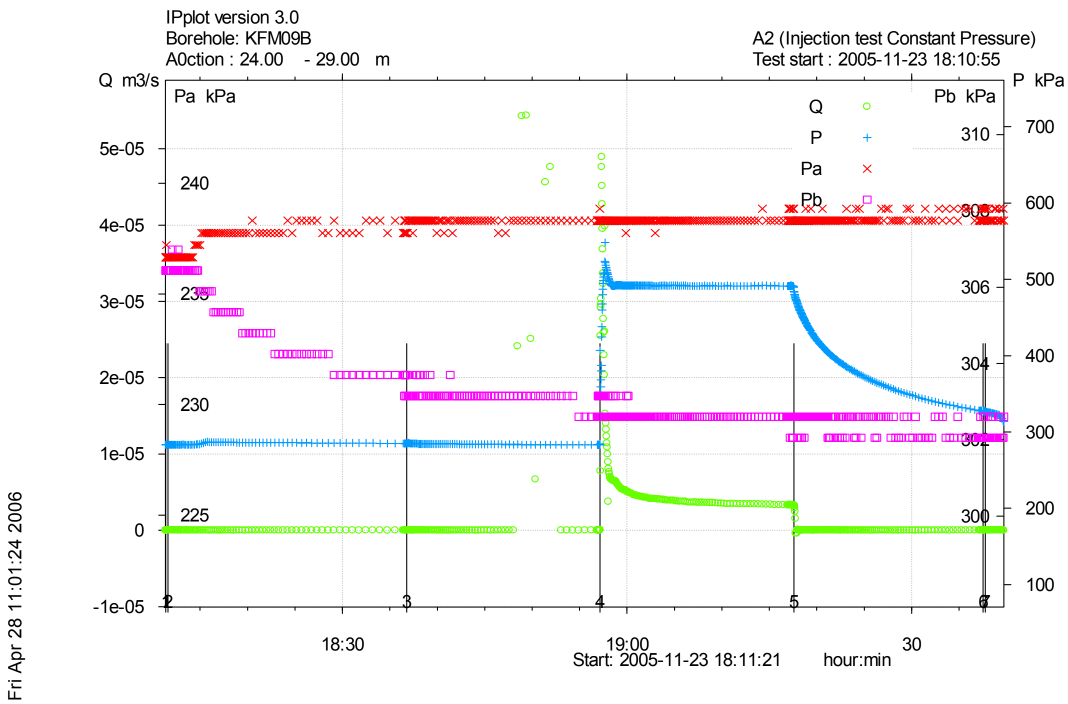


Figure A3-163. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 24.0-29.0 m in borehole KFM09B.

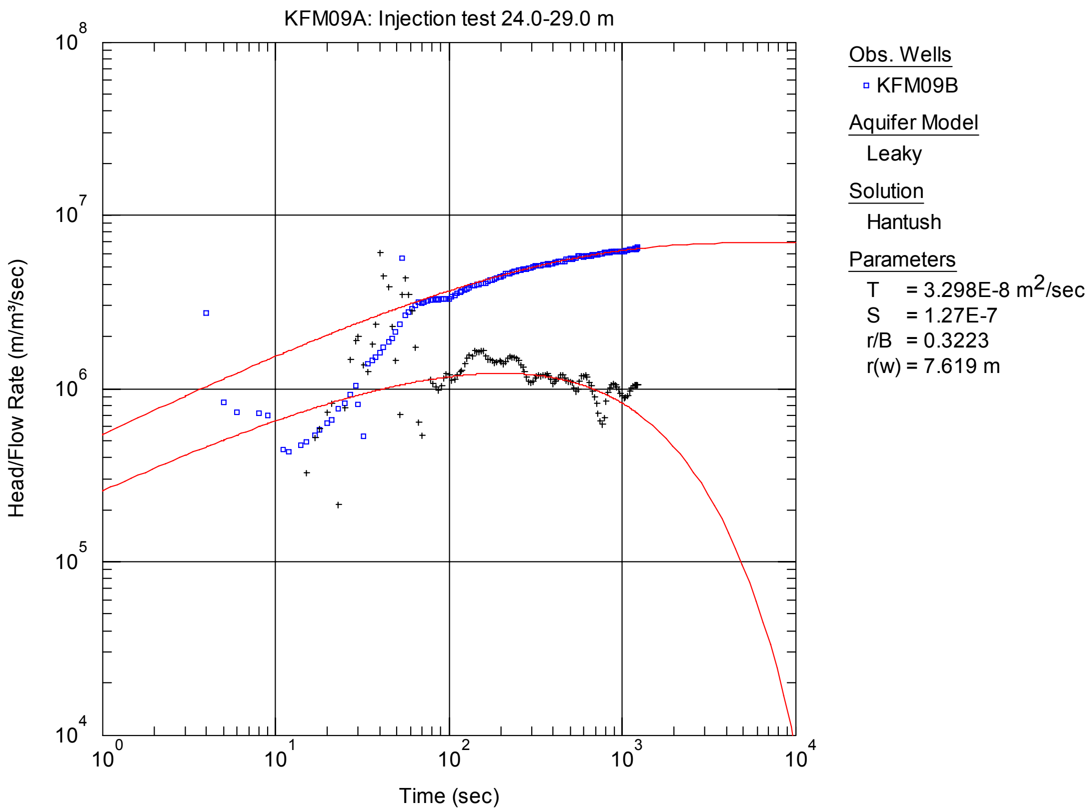


Figure A3-164. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 24.0-29.0 m in KFM09B.

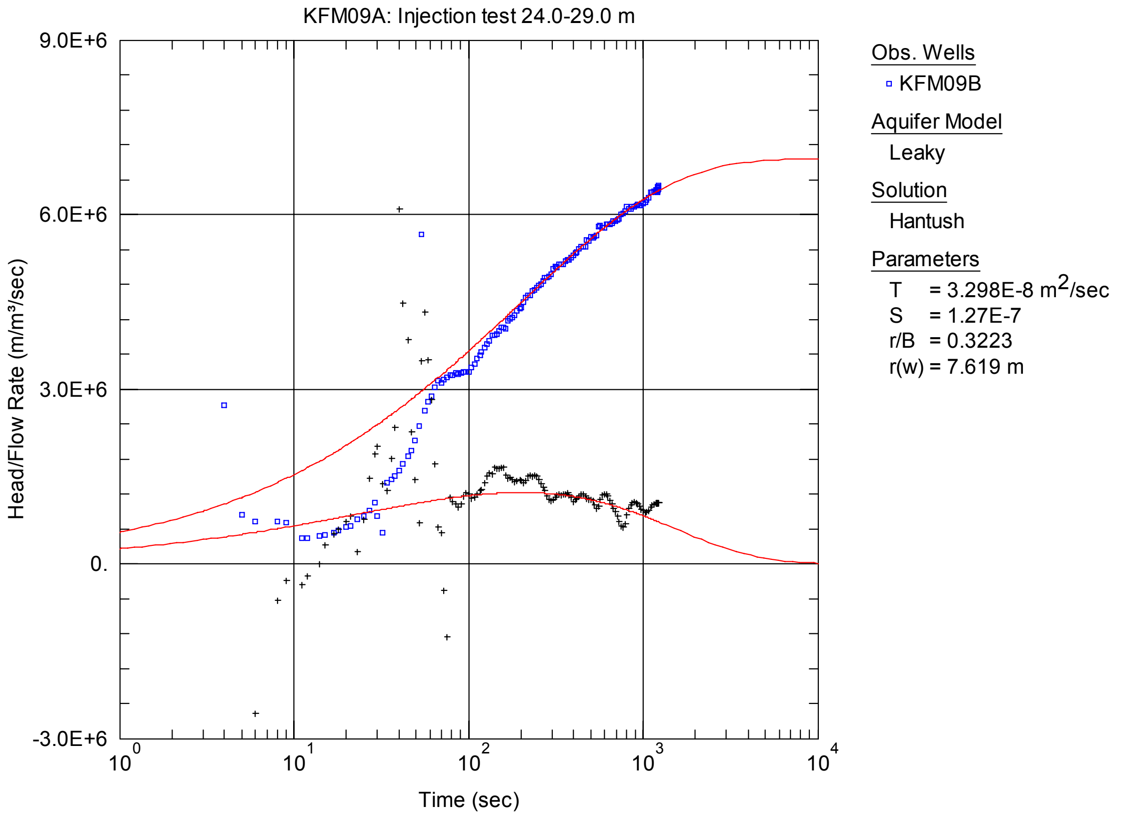


***Figure A3-165.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 24.0-29.0 m in KFM09B.*

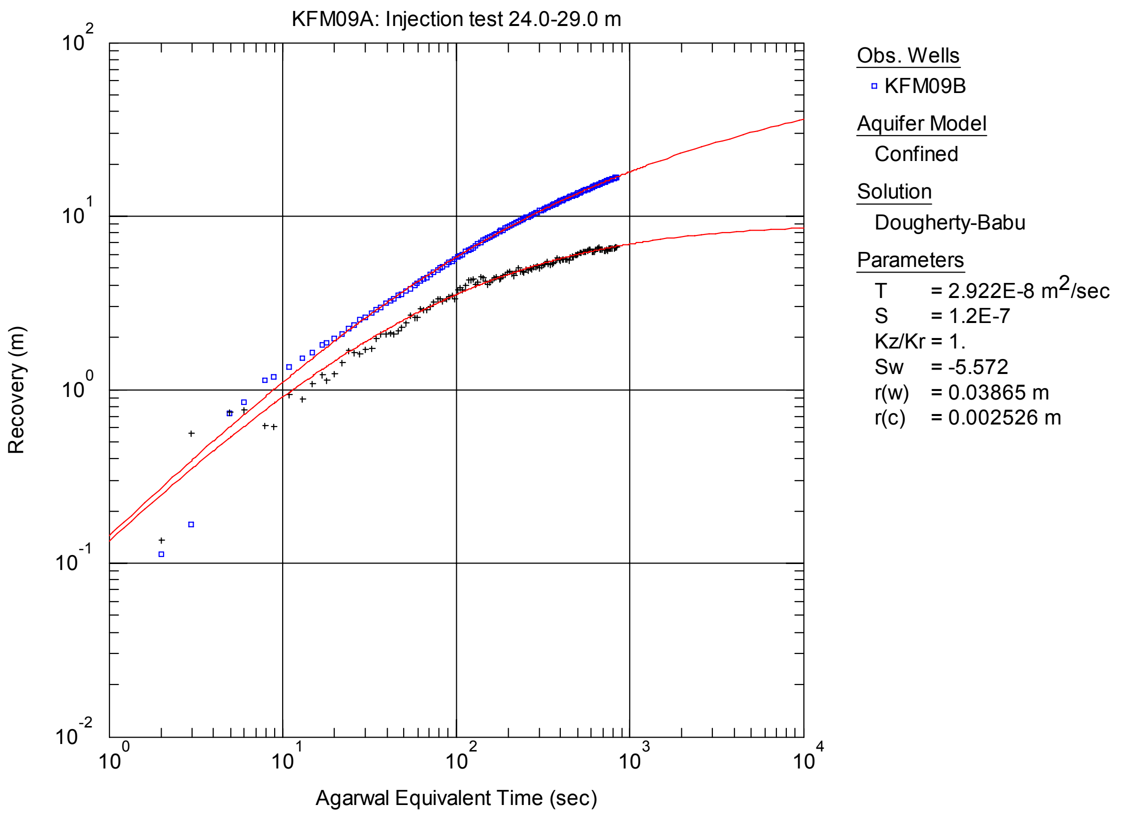


***Figure A3-166.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 24.0-29.0 m in KFM09B.*

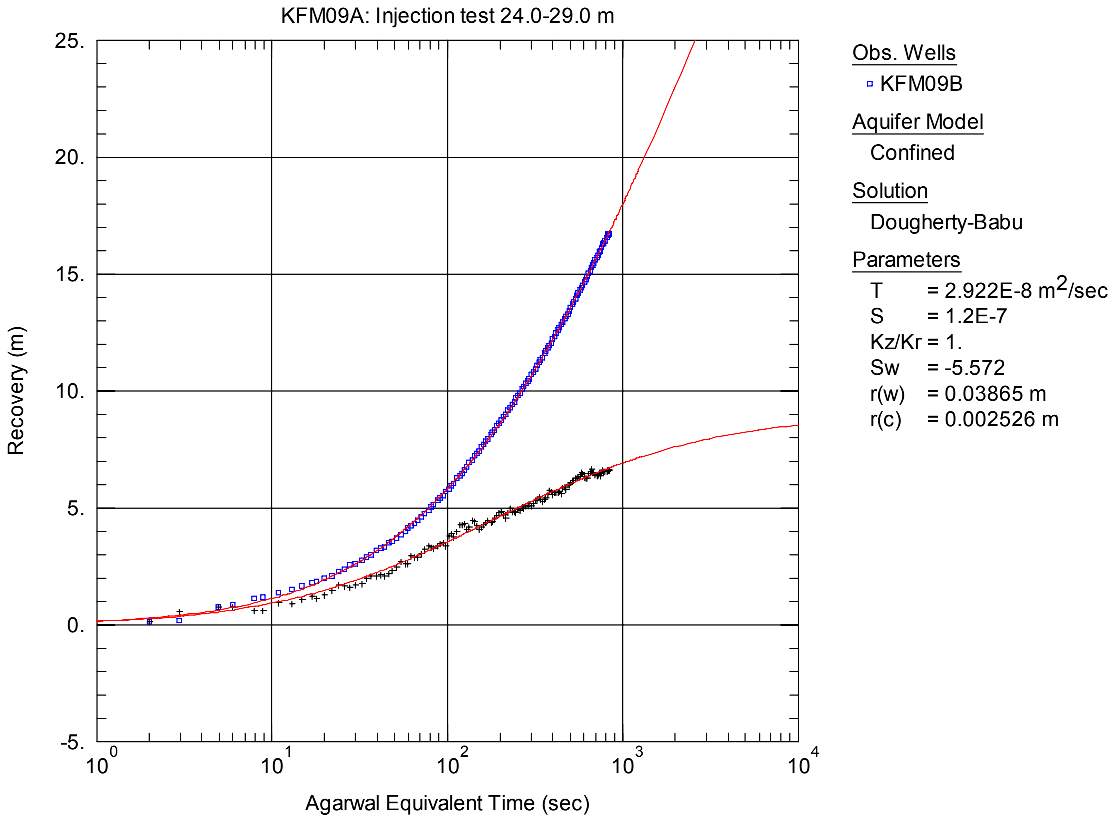


Figure A3-167. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 24.0-29.0 m in KFM09B.*

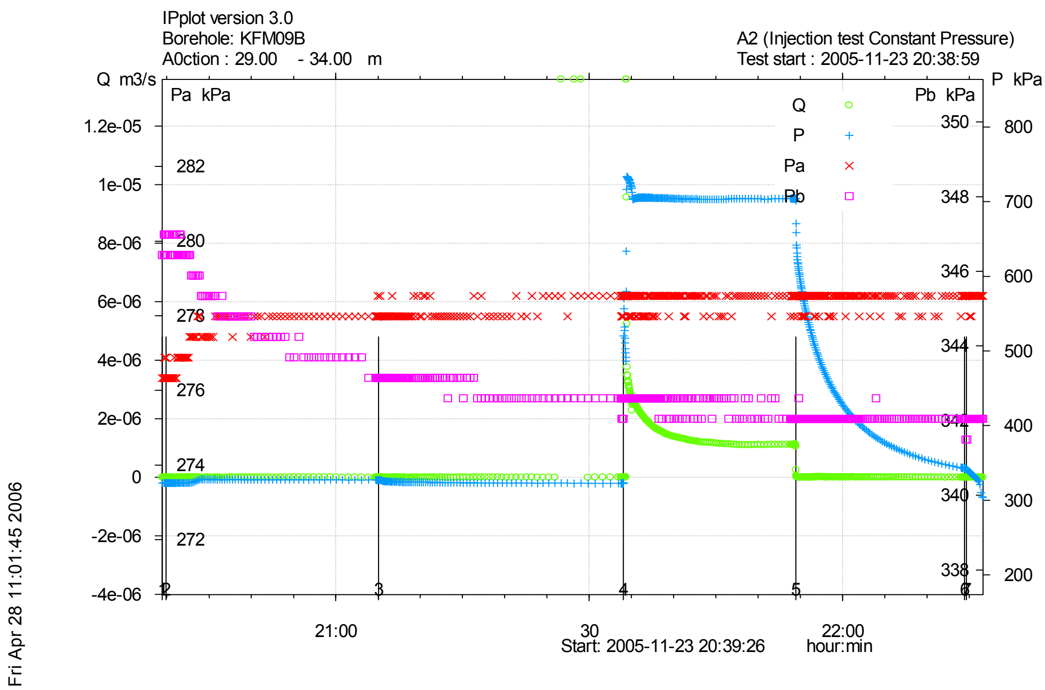


Figure A3-168. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 29.0-34.0 m in borehole KFM09B.*

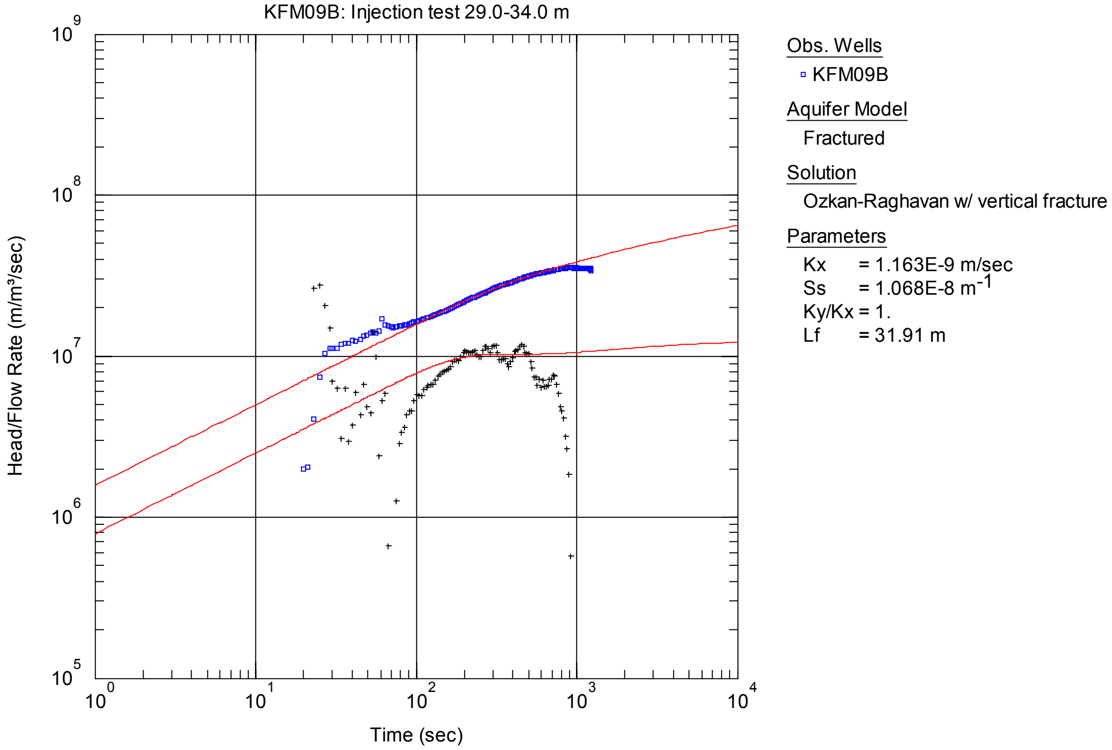


***Figure A3-169.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 29.0-34.0 m in KFM09B.*

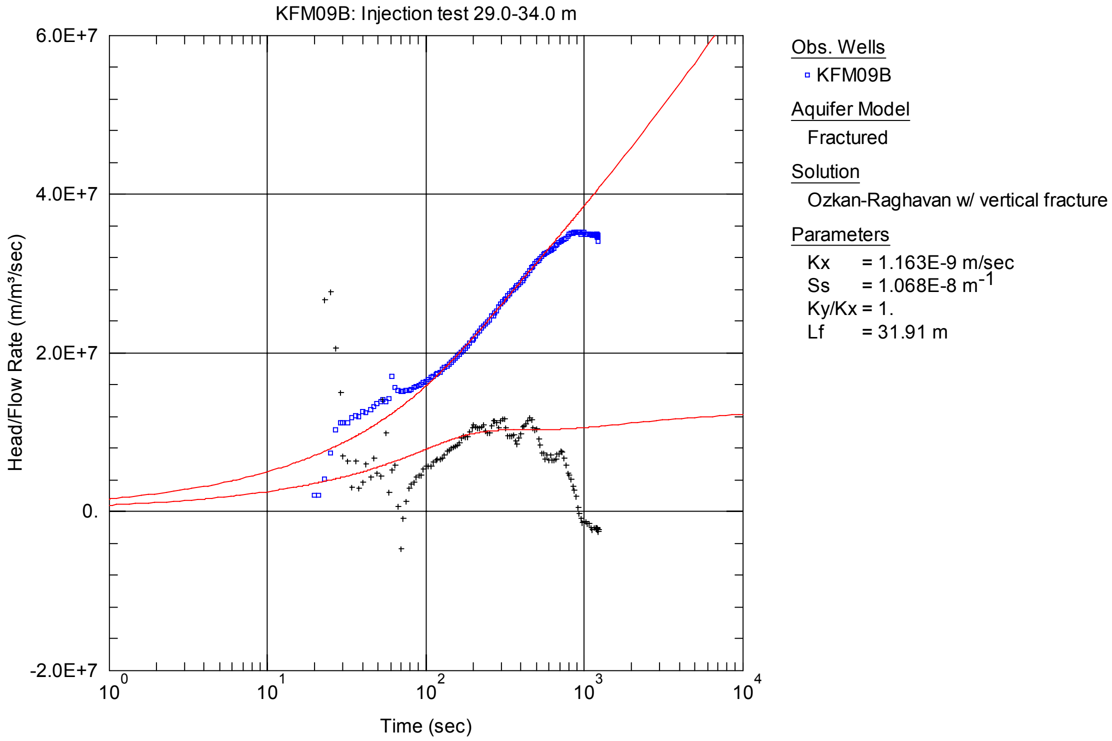


***Figure A3-170.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 29.0-34.0 m in KFM09B.*

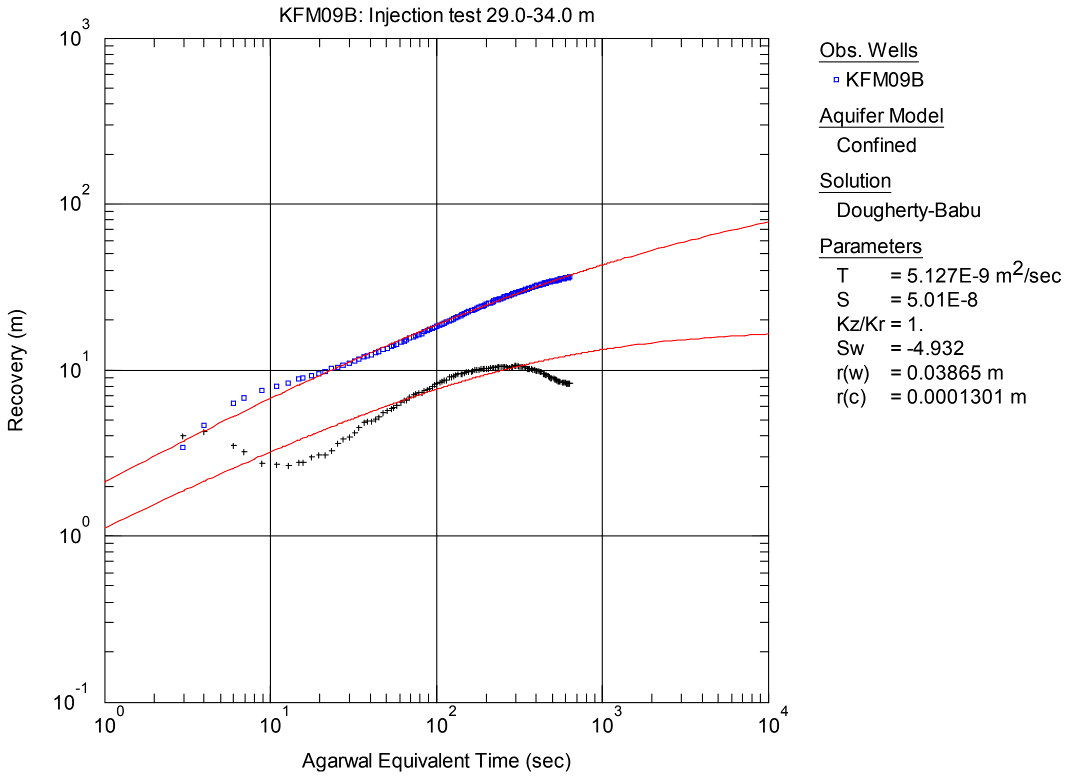


***Figure A3-171.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Dougherty-Babu solution, from the injection test in section 29.0-34.0 m in KFM09B.*

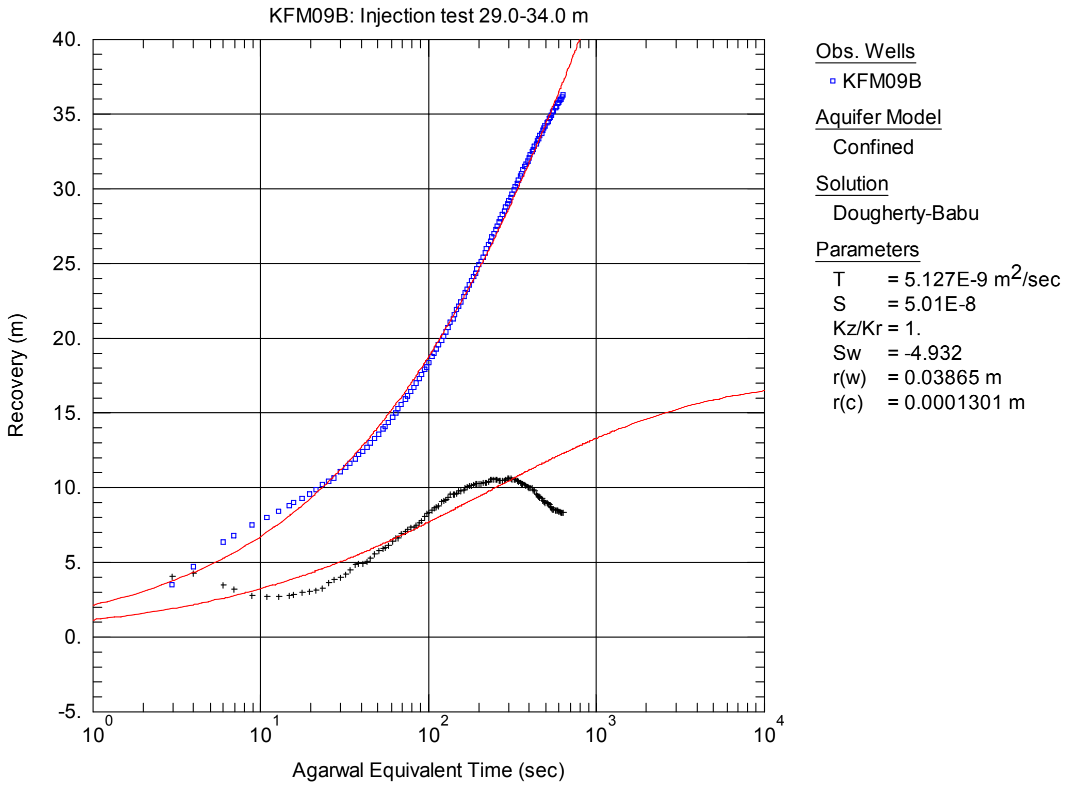


***Figure A3-172.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Dougherty-Babu solution, from the injection test in section 29.0-34.0 m in KFM09B.*

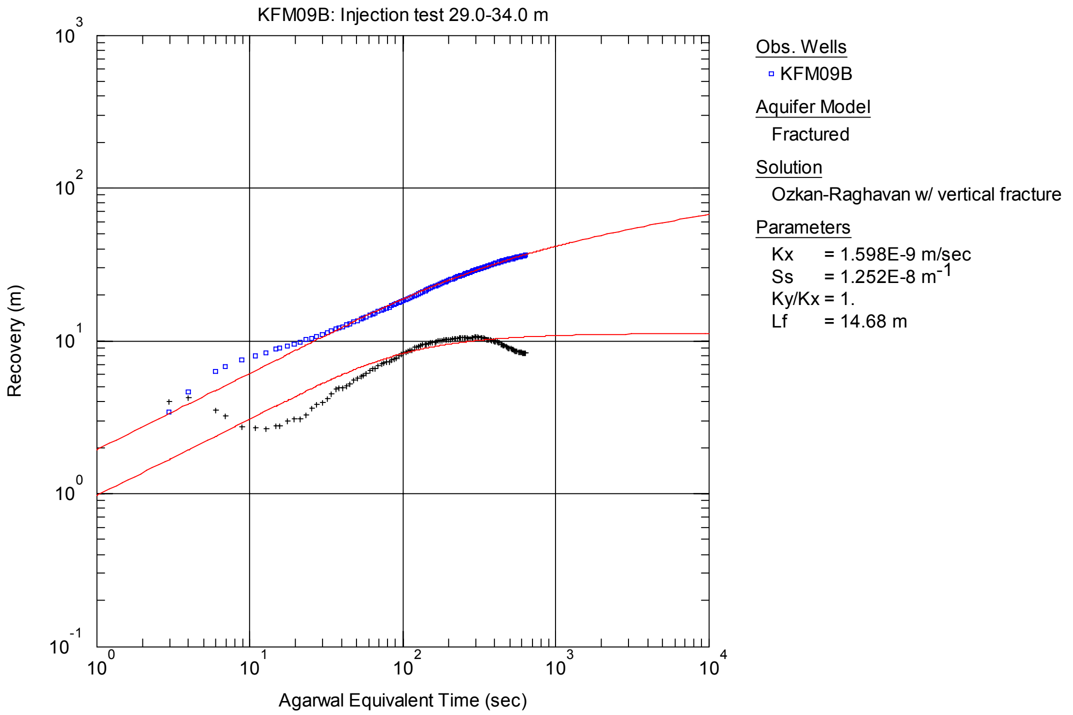


Figure A3-173. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 29.0-34.0 m in KFM09B.*

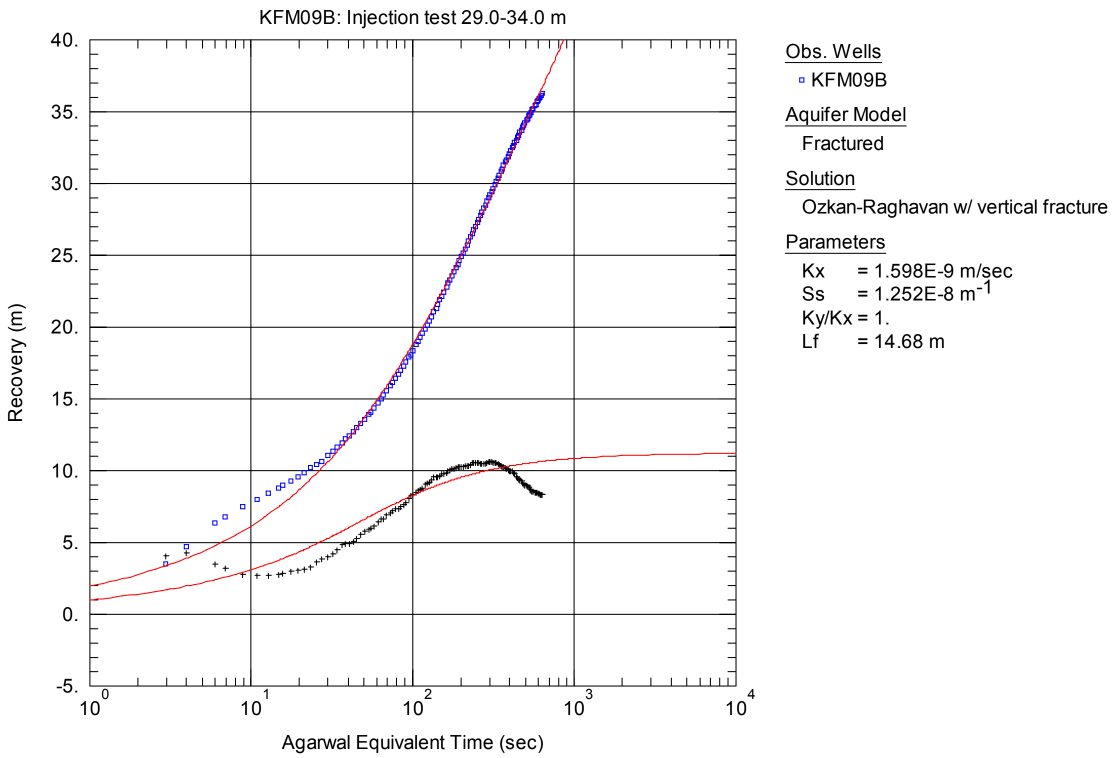


Figure A3-174. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 29.0-34.0 m in KFM09B.*

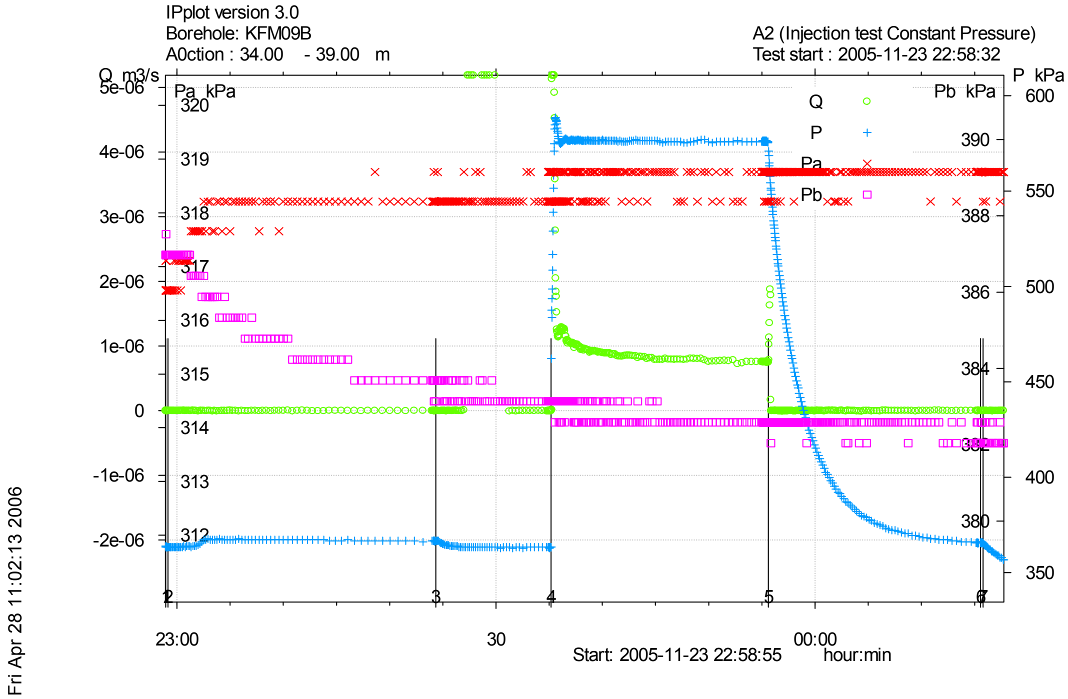


Figure A3-175. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 34.0-39.0 m in borehole KFM09B.

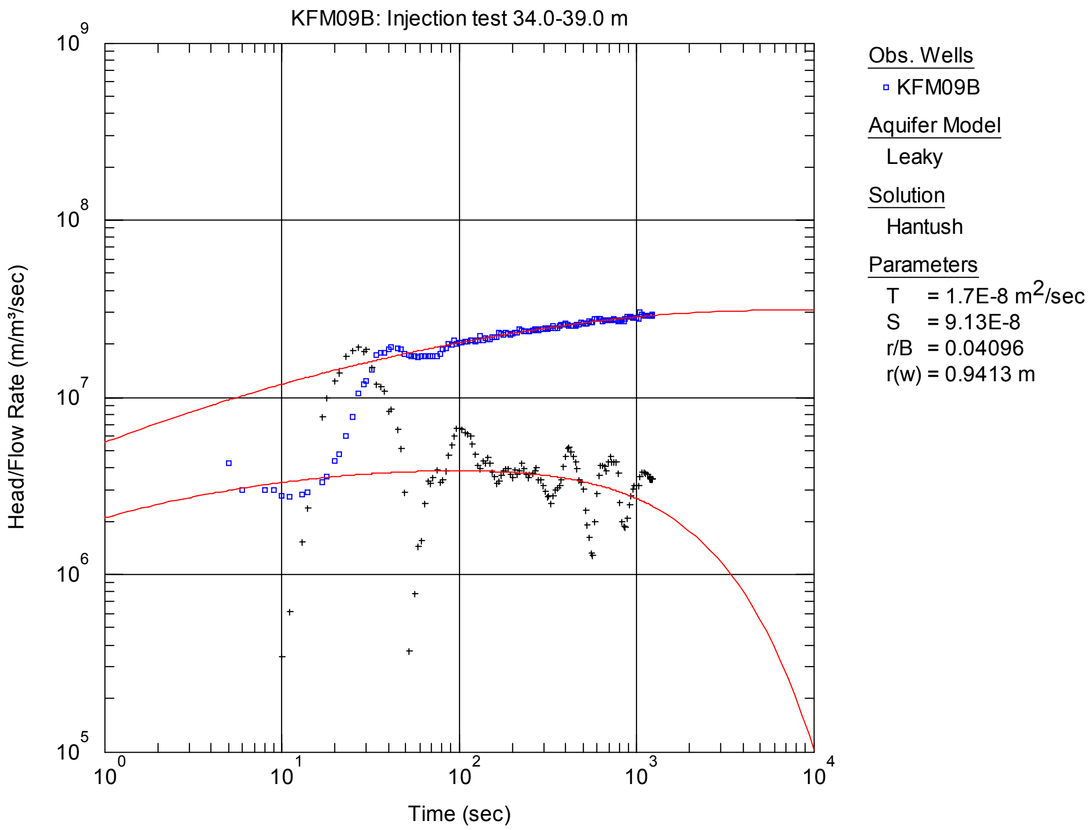


Figure A3-176. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 34.0-39.0 m in KFM09B.

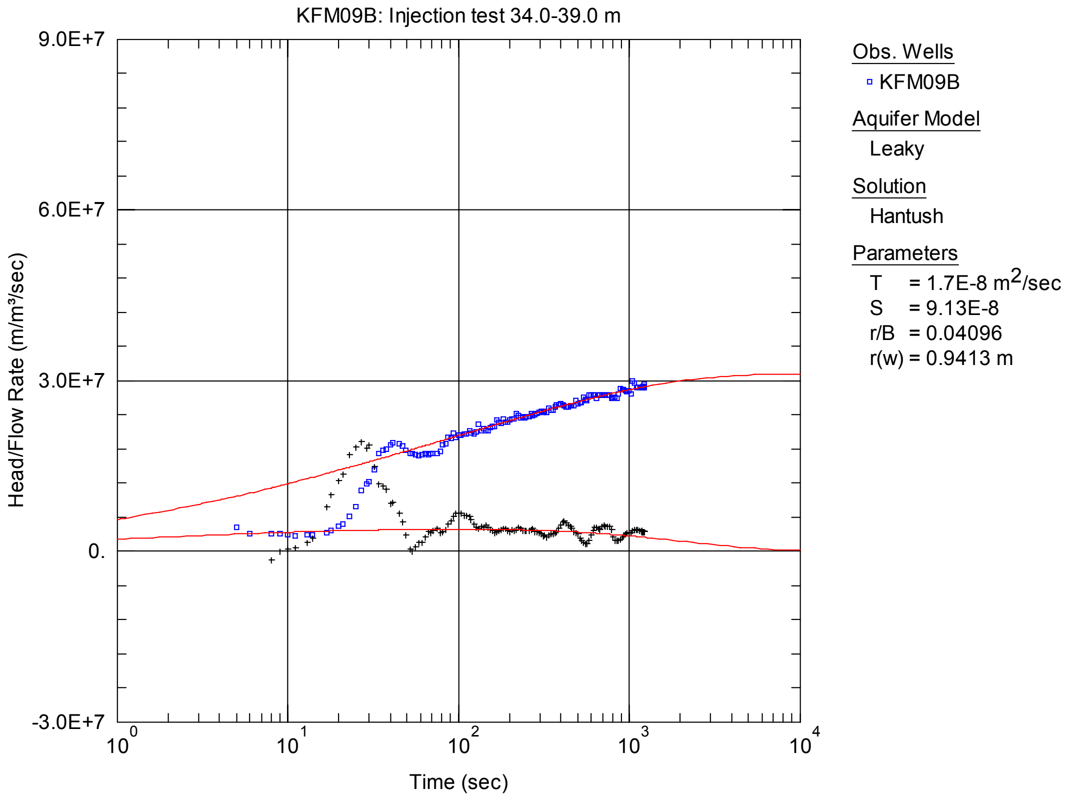


Figure A3-177. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 34.0-39.0 m in KFM09B.*

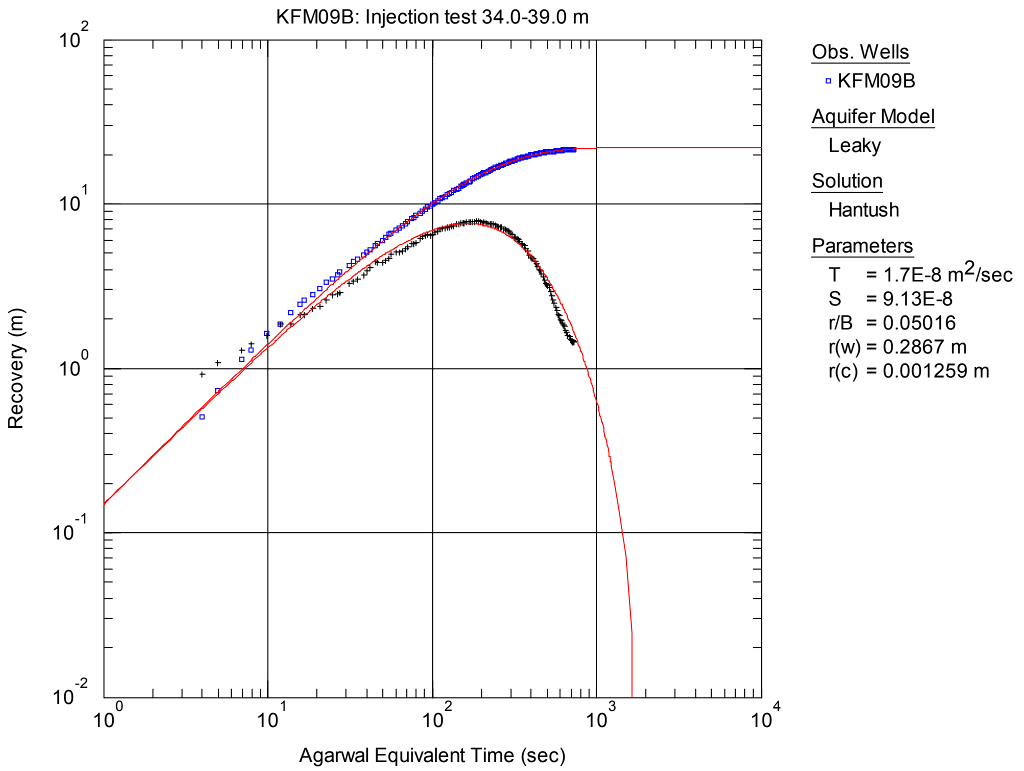


Figure A3-178. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 34.0-39.0 m in KFM09B. No unambiguous transient evaluation was possible for the recovery period. This diagram demonstrates a solution assuming the same values of transmissivity and storativity as were estimated from the injection period.*

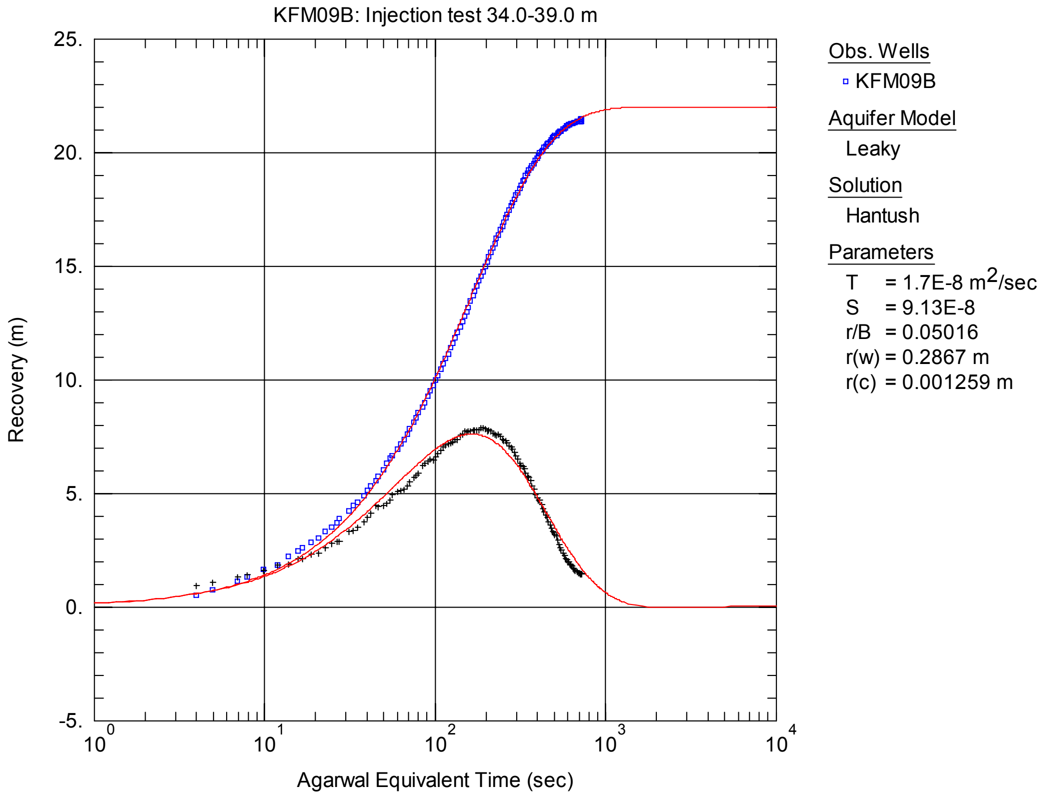


Figure A3-179. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 34.0-39.0 m in KFM09B. No unambiguous transient evaluation was possible for the recovery period. This diagram demonstrates a solution assuming the same values of transmissivity and storativity as were estimated from the injection period.*

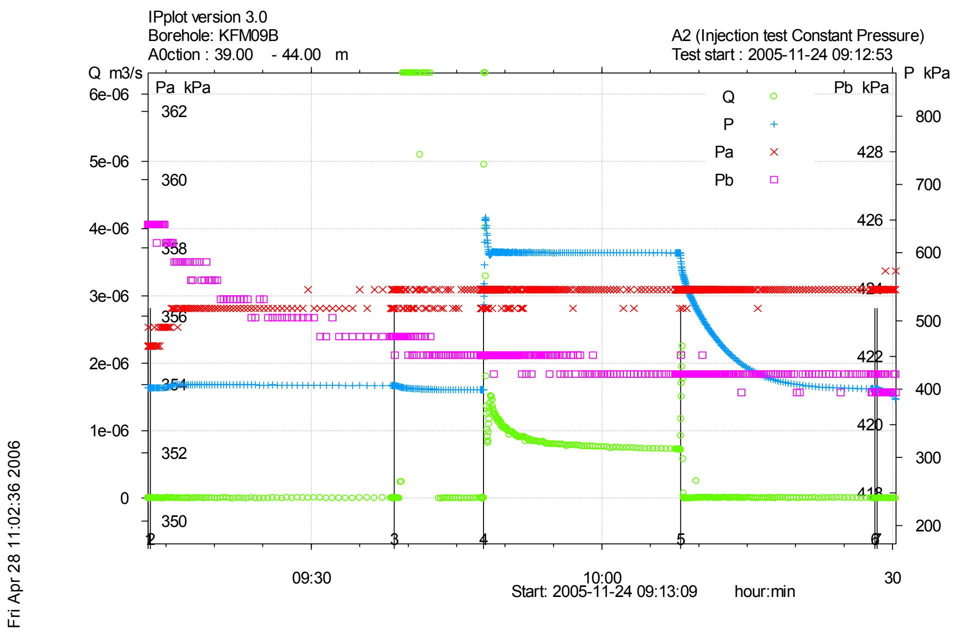


Figure A3-180. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 39.0-44.0 m in borehole KFM09B.*

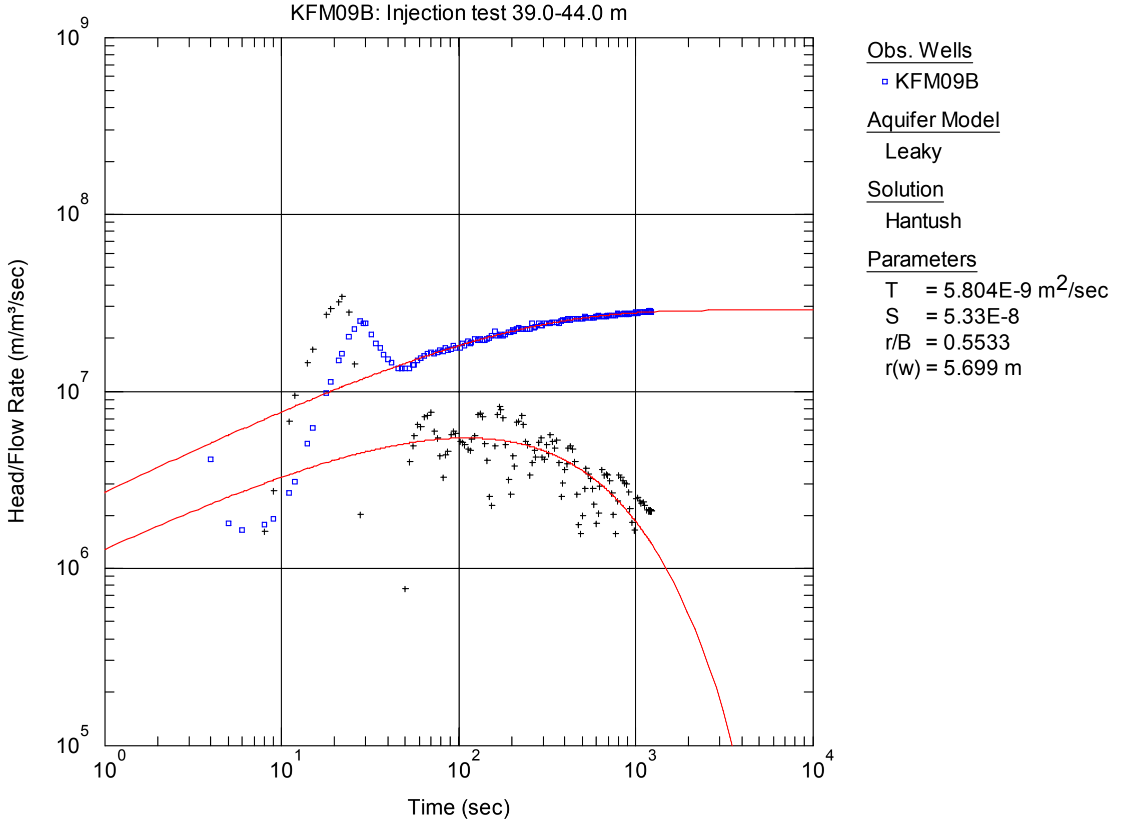


***Figure A3-181.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 39.0-44.0 m in KFM09B.*

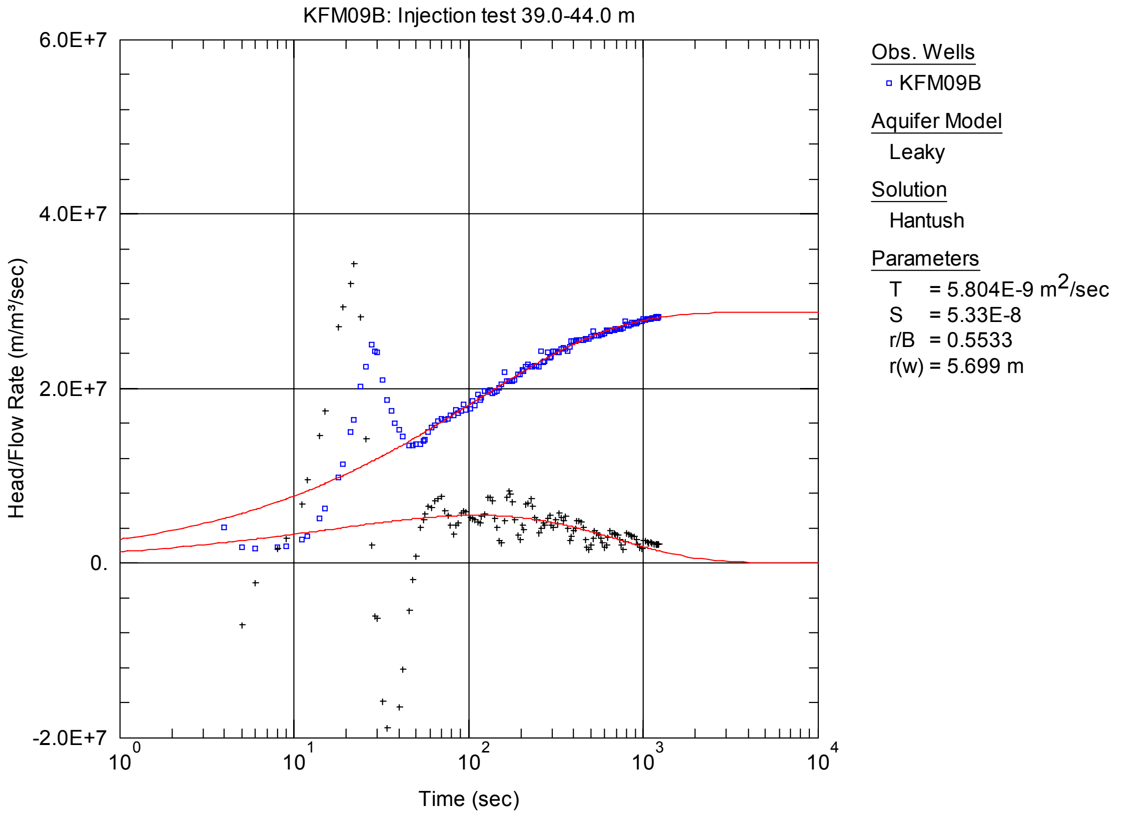


***Figure A3-182.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 39.0-44.0 m in KFM09B.*

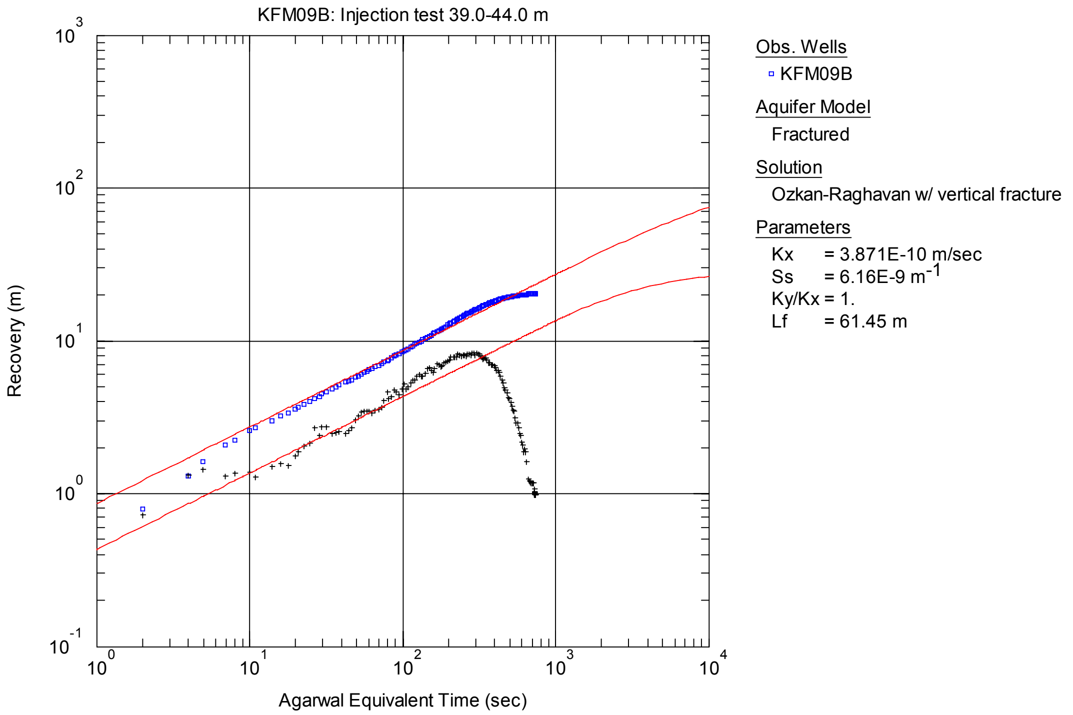


Figure A3-183. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 39.0-44.0 m in KFM09B. No unambiguous transient evaluation was possible from the recovery period. This solution is only shown for demonstrative purposes.*

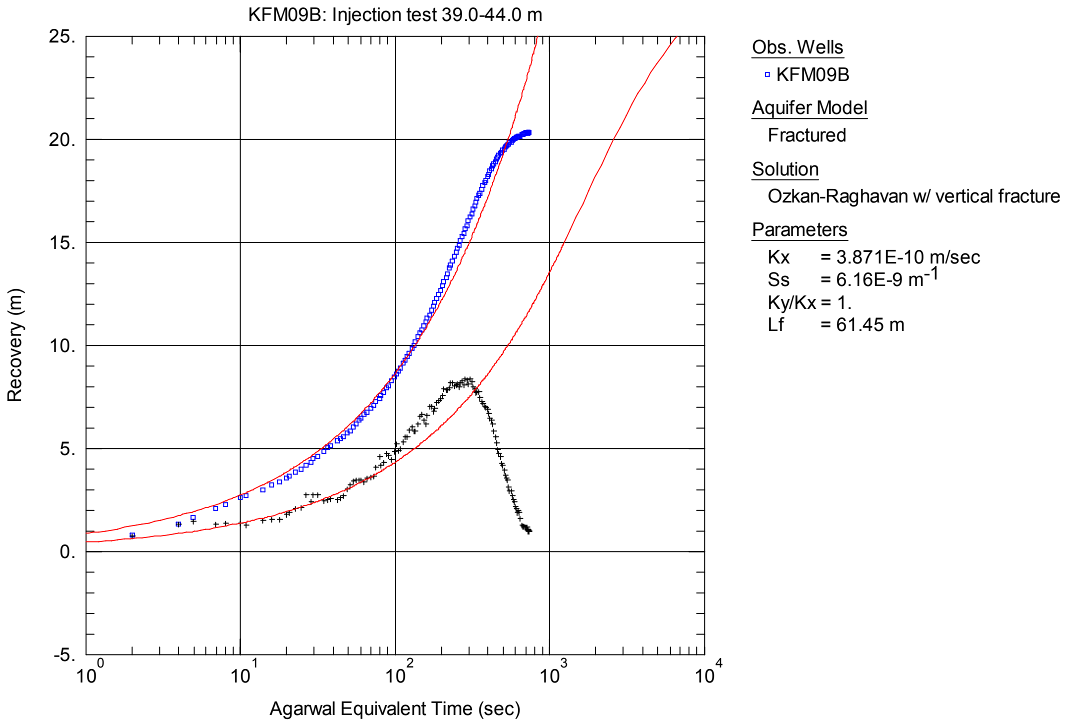


Figure A3-184. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 39.0-44.0 m in KFM09B. No unambiguous transient evaluation was possible from the recovery period. This solution is only shown for demonstrative purposes.*

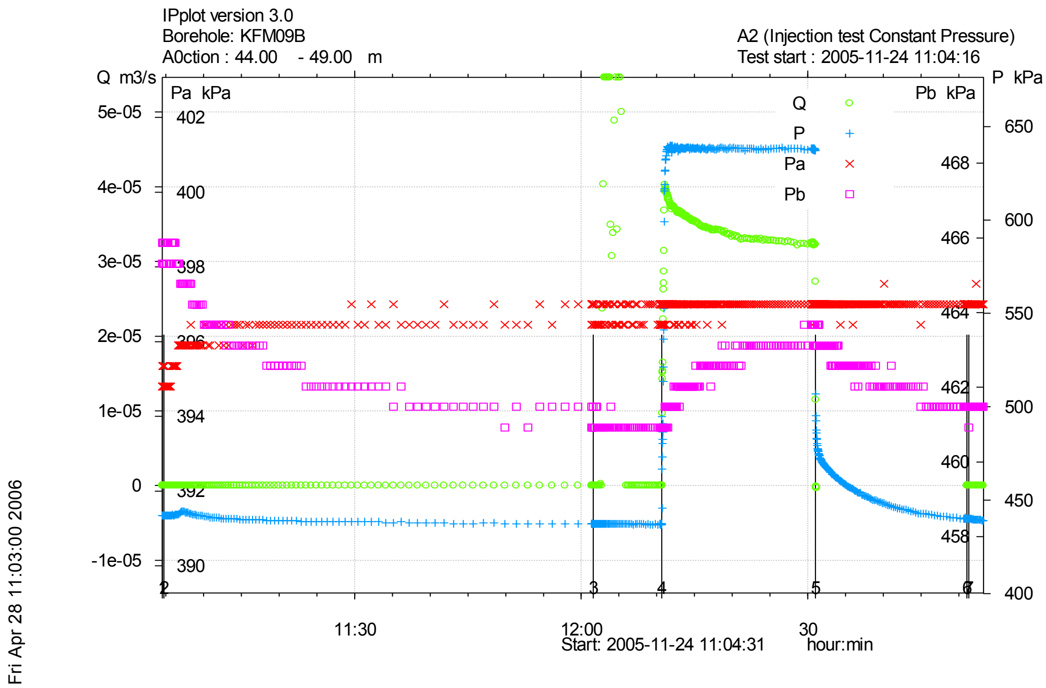


Figure A3-185. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 44.0-49.0 m in borehole KFM09B.

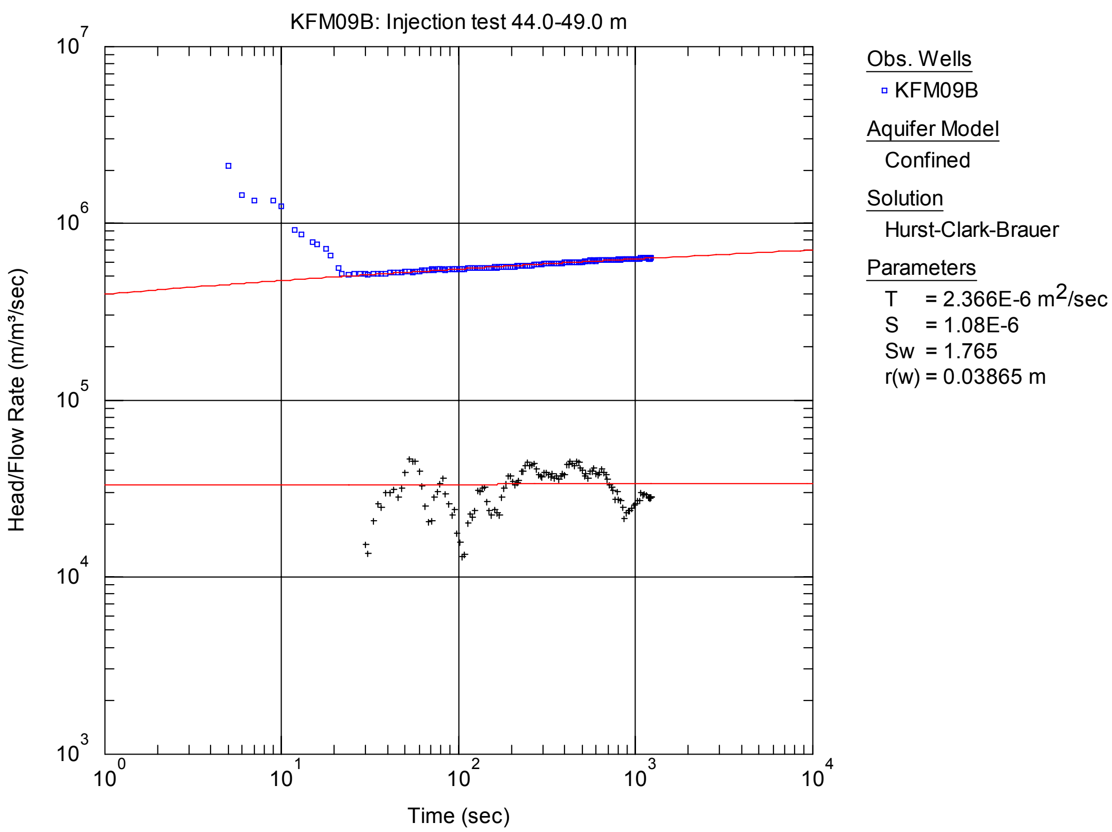


Figure A3-186. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 44.0-49.0 m in KFM09B.

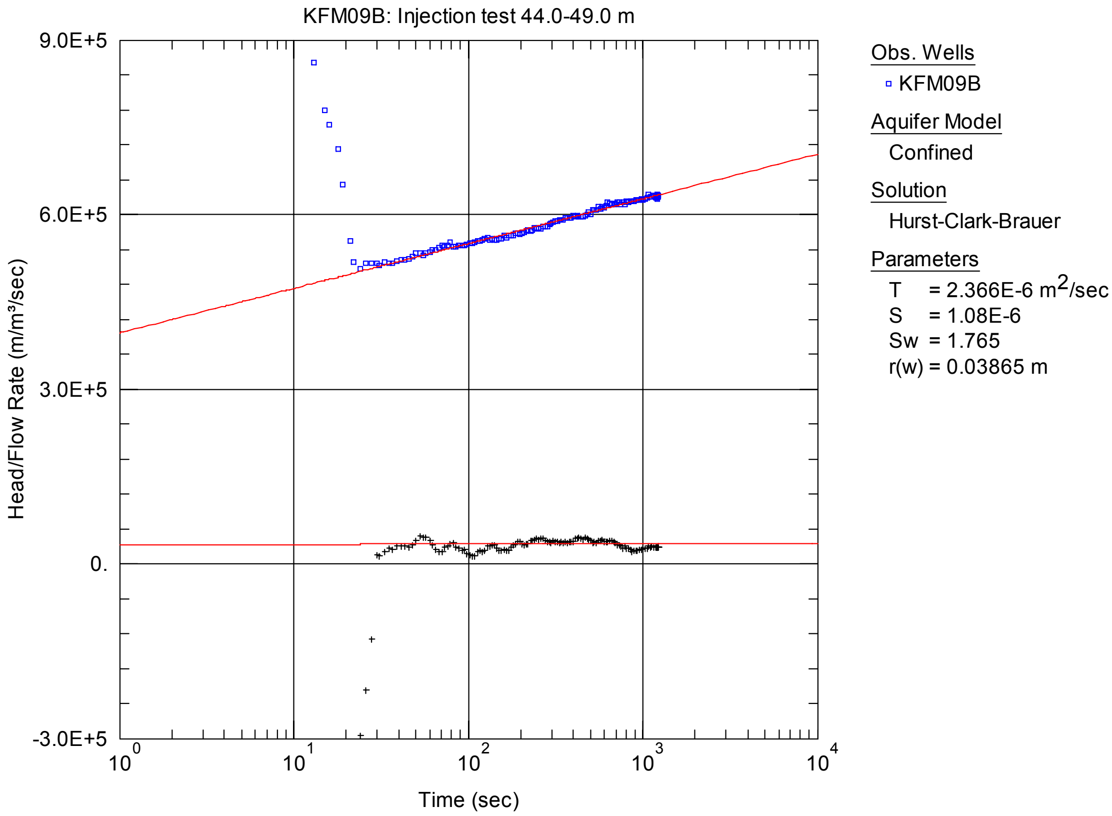


Figure A3-187. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 44.0-49.0 m in KFM09B.*

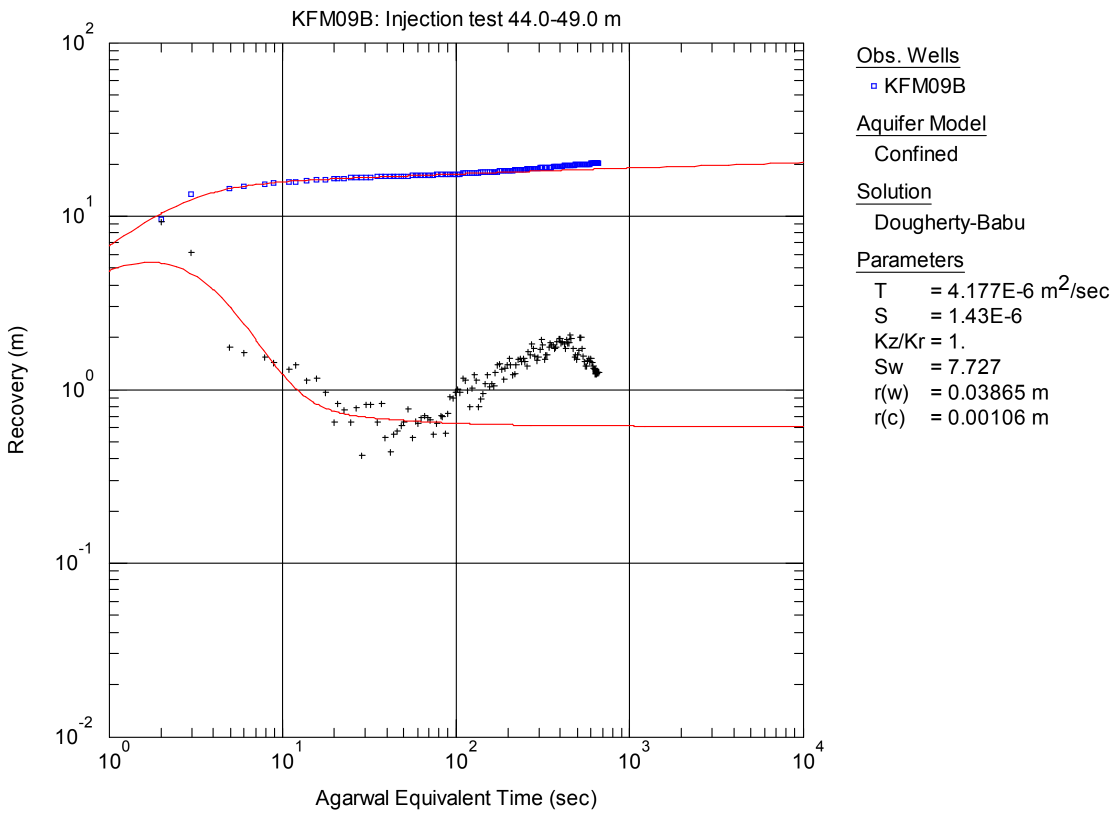


Figure A3-188. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 44.0-49.0 m in KFM09B.*

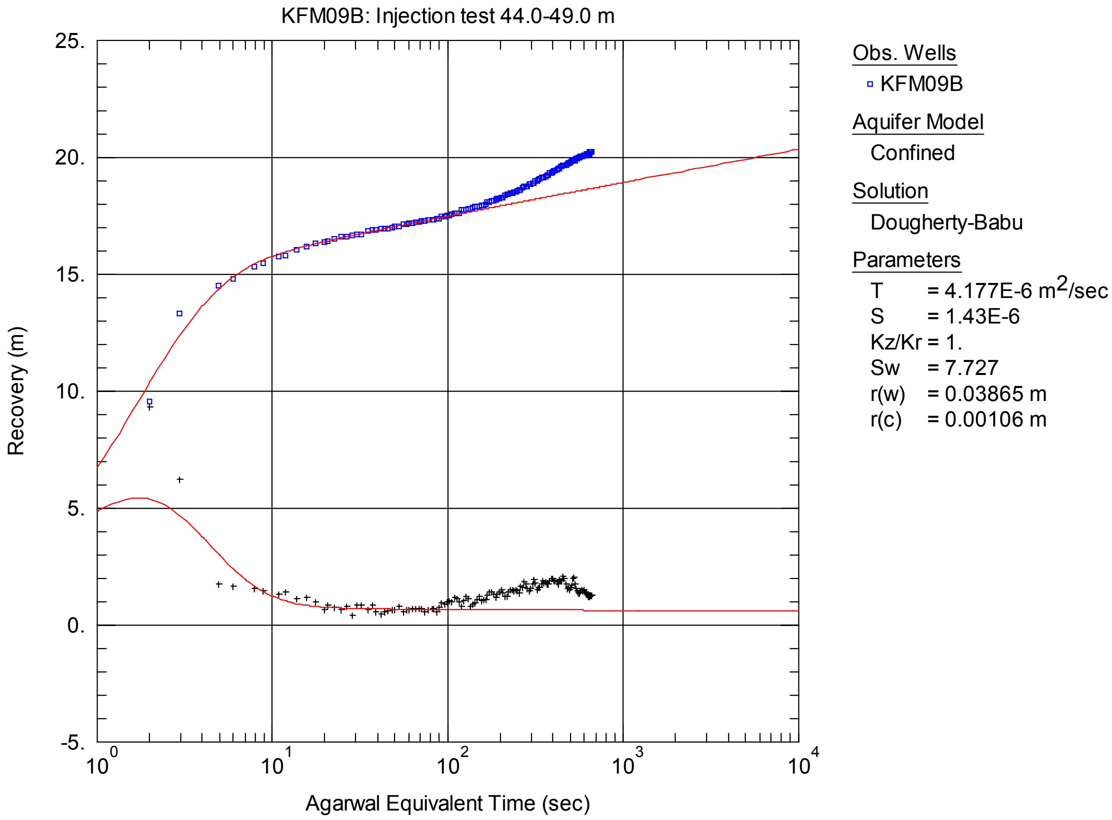


***Figure A3-189.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 44.0-49.0 m in KFM09B.*

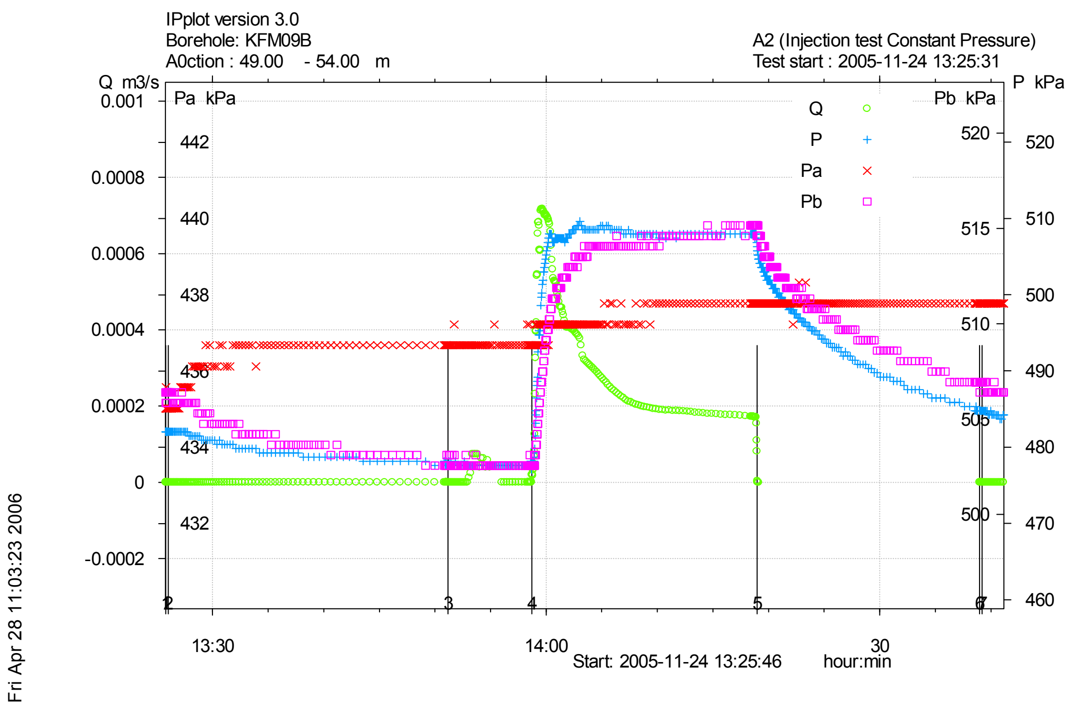


***Figure A3-190.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 49.0-54.0 m in borehole KFM09B.*

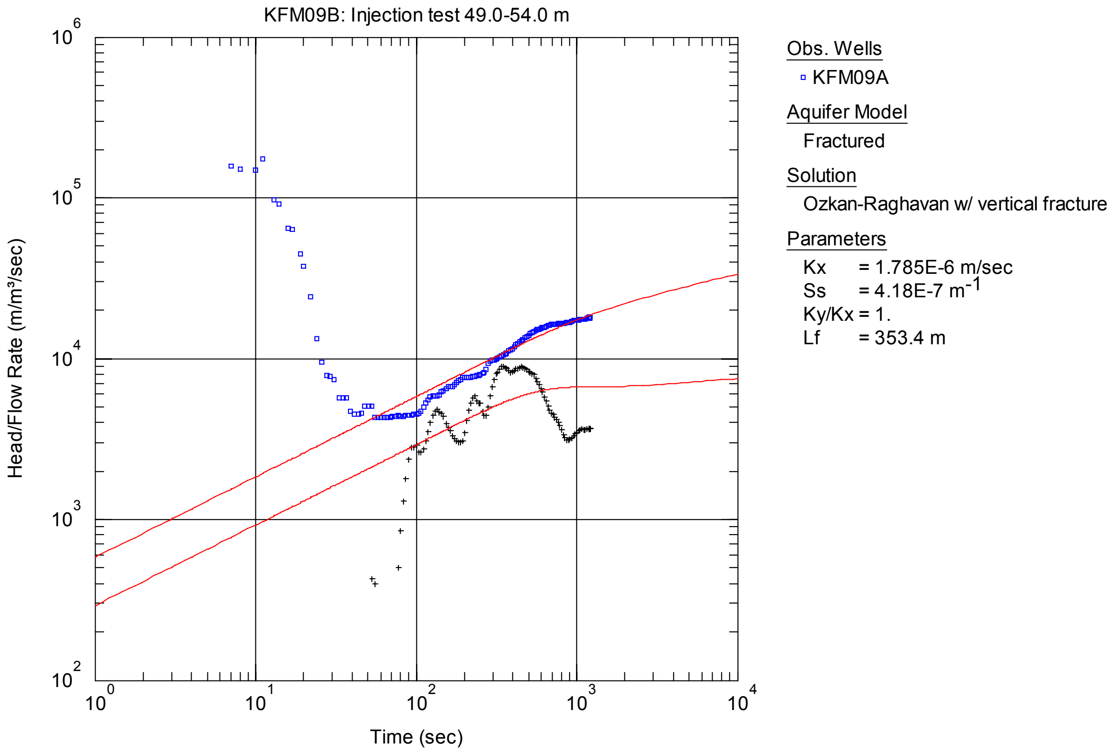


Figure A3-191. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 49.0-54.0 m in KFM09B.*

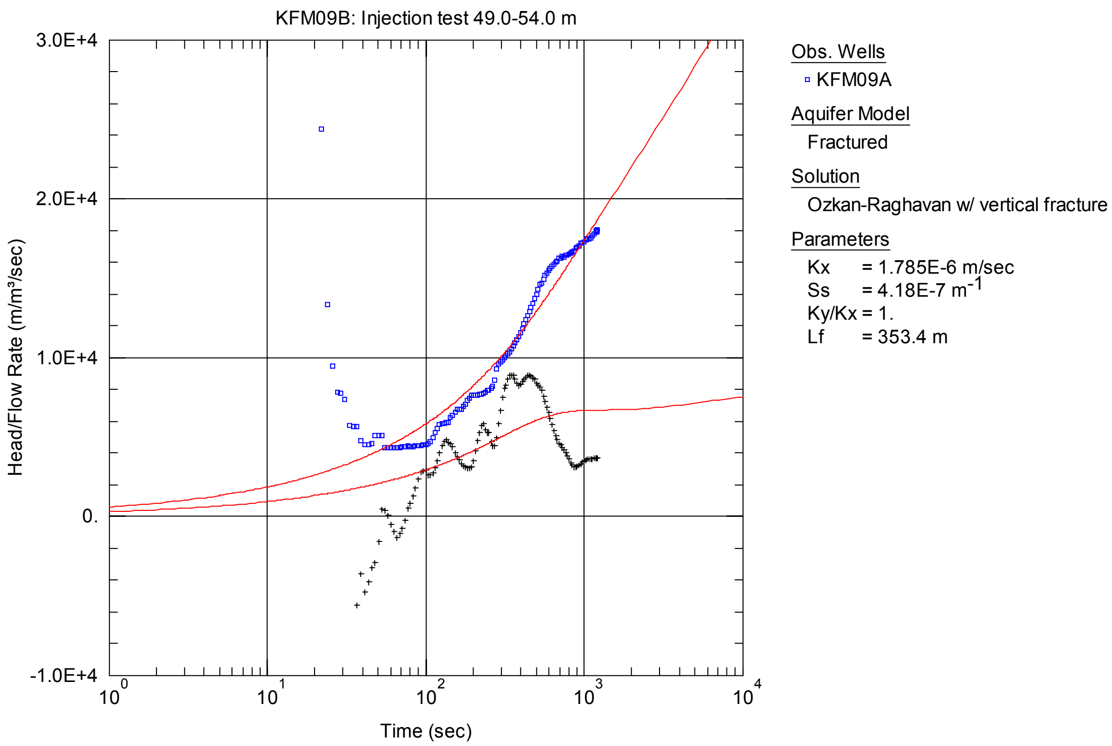


Figure A3-192. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 49.0-54.0 m in KFM09B.*

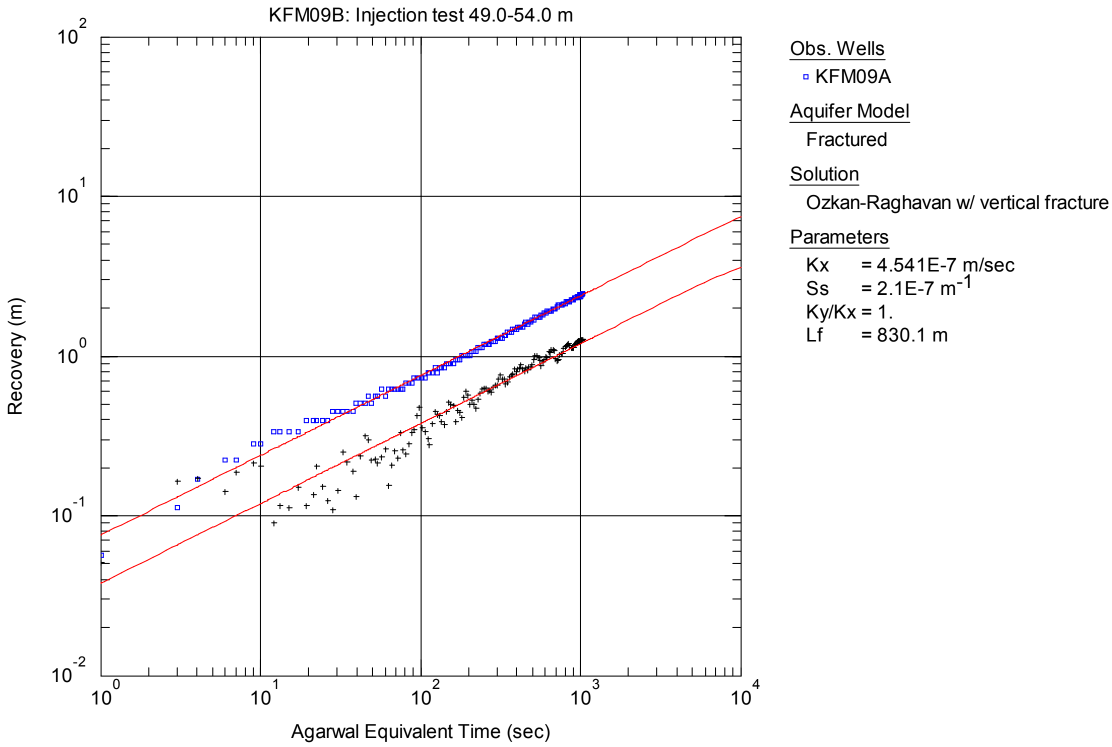


Figure A3-193. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 49.0-54.0 m in KFM09B. The type curve fit is showing a possible, however not unambiguous, evaluation.*

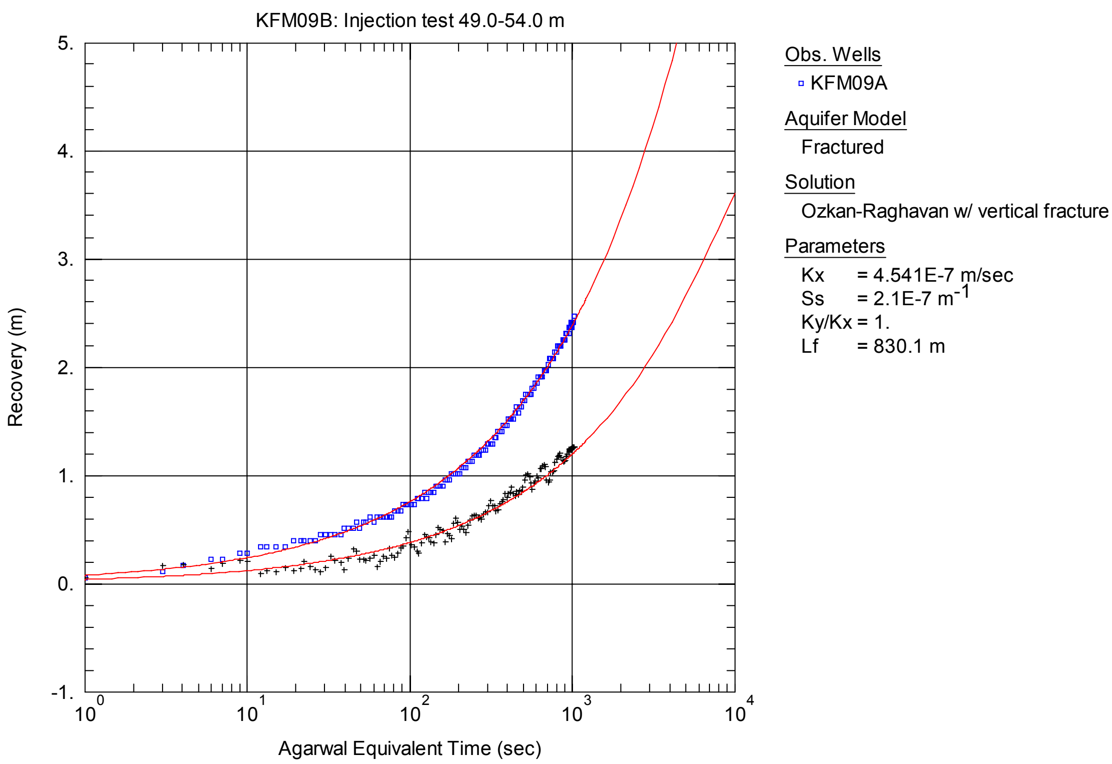


Figure A3-194. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 49.0-54.0 m in KFM09B. The type curve fit is showing a possible, however not unambiguous, evaluation.*

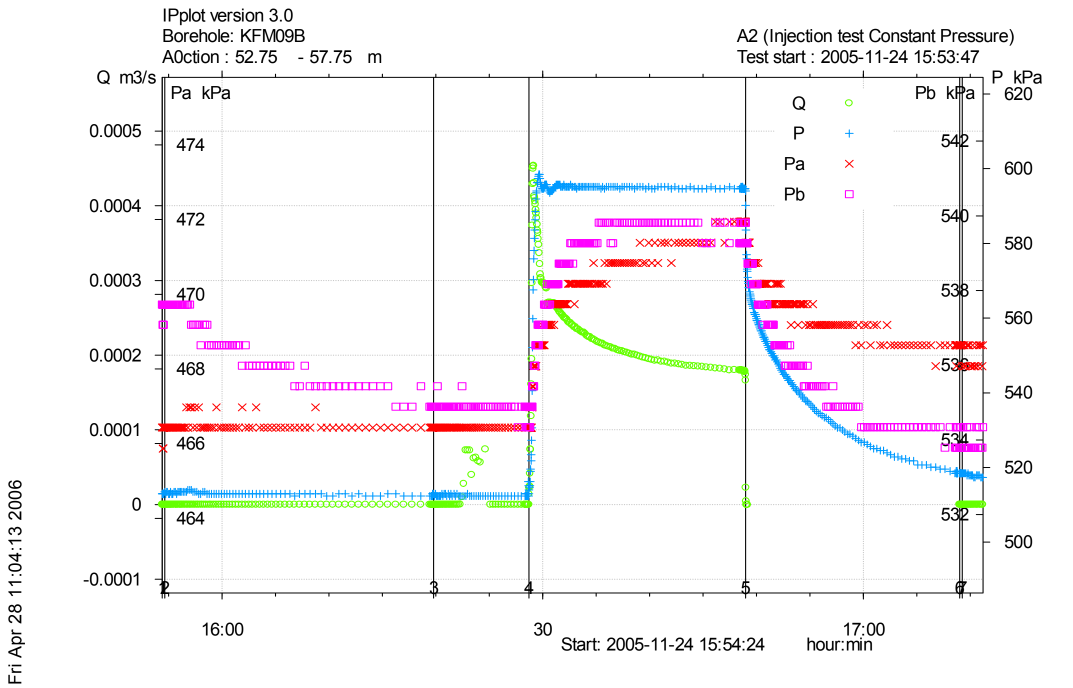


Figure A3-195. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 52.75-57.75 m in borehole KFM09B.*

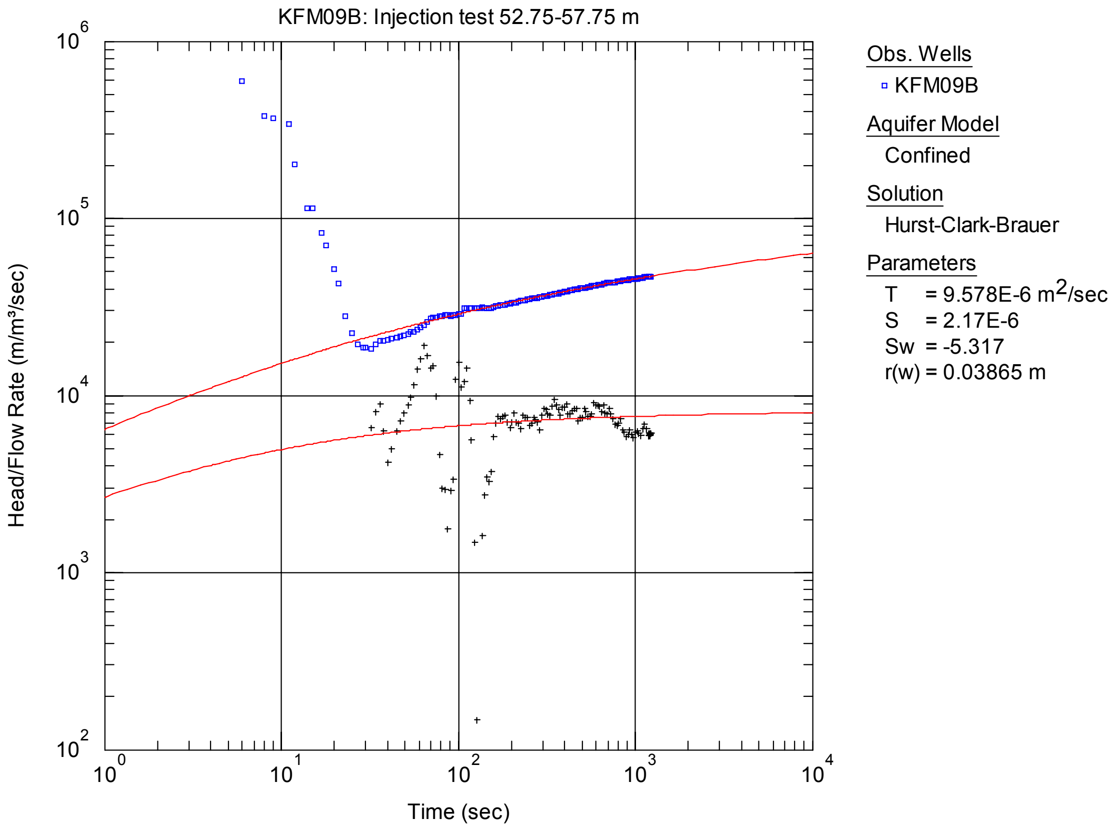


Figure A3-196. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 52.75-57.75 m in KFM09B.*

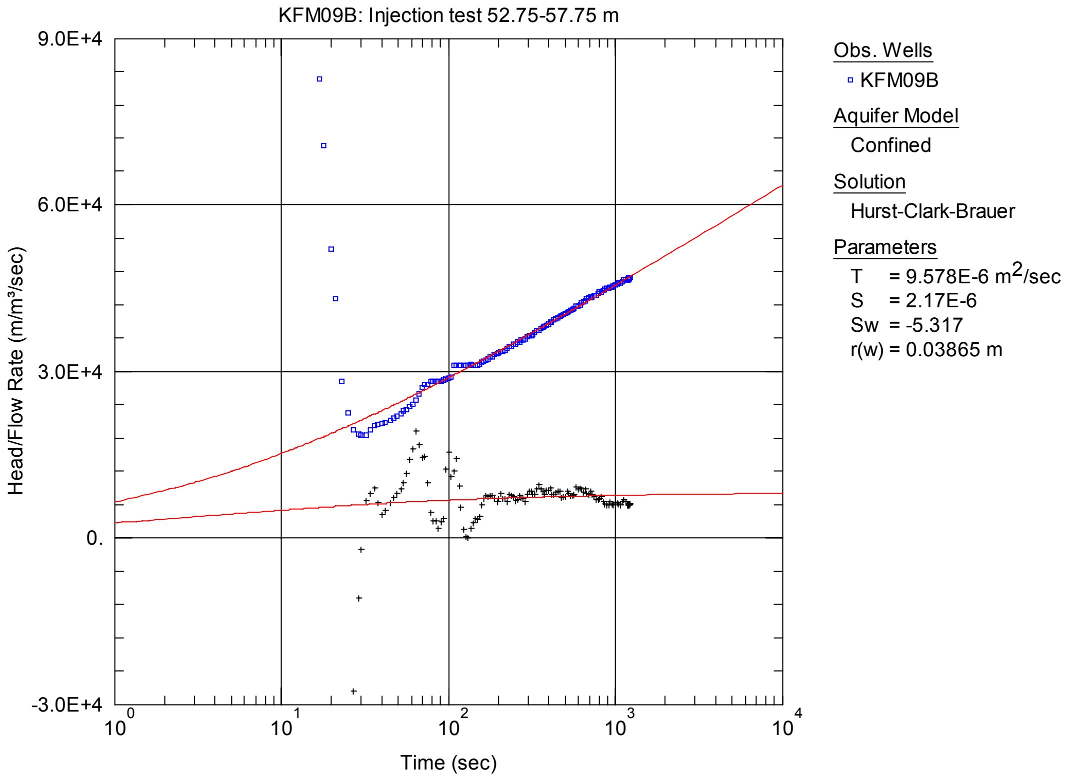


***Figure A3-197.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 52.75-57.75 m in KFM09B.*

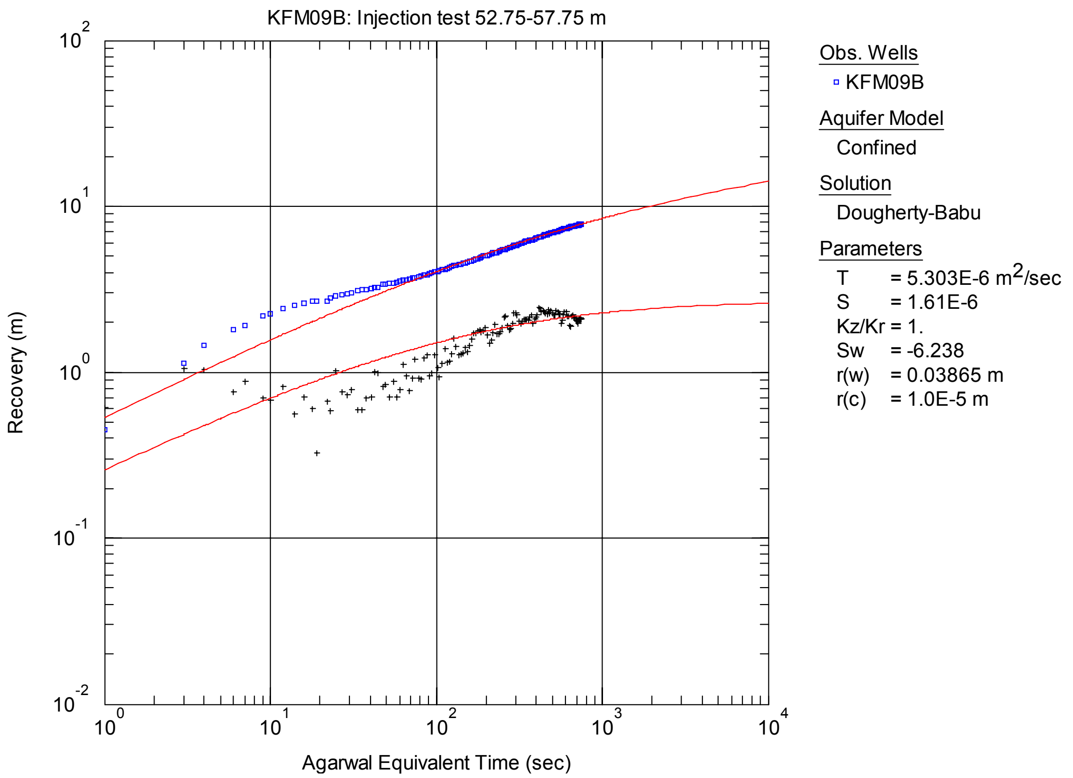


***Figure A3-198.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Dougherty-Babu solution, from the injection test in section 52.75-57.75 m in KFM09B.*

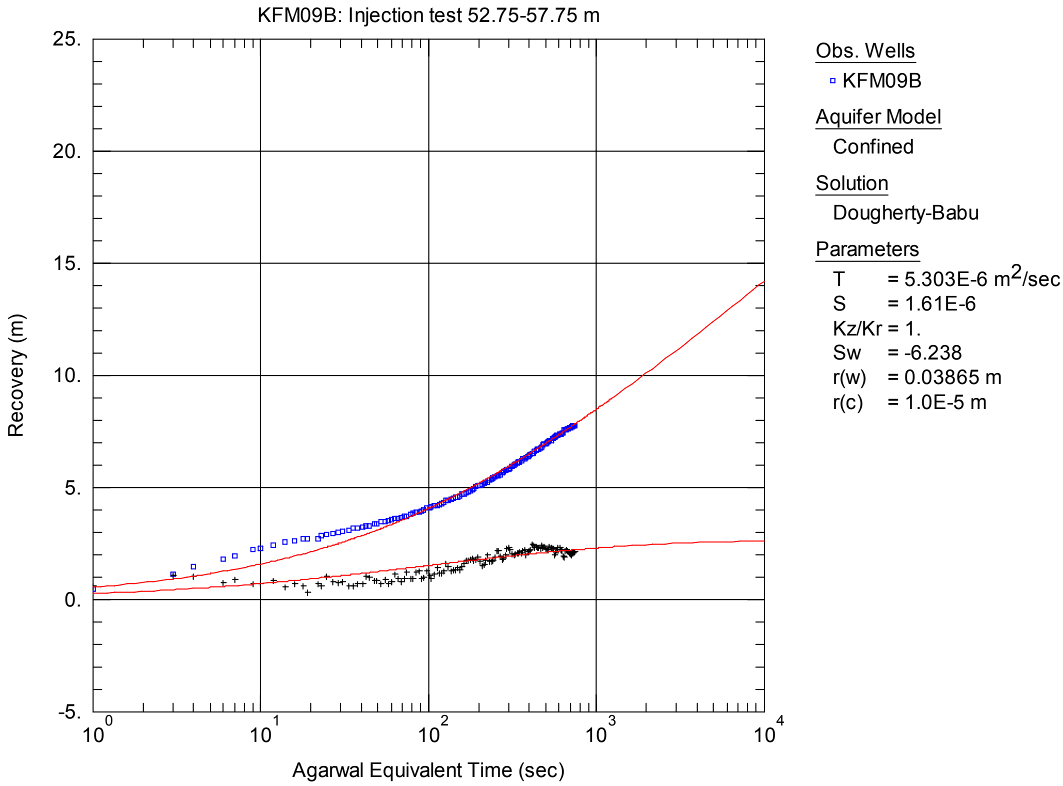


Figure A3-199. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Dougherty-Babu solution, from the injection test in section 52.75-57.75 m in KFM09B.*

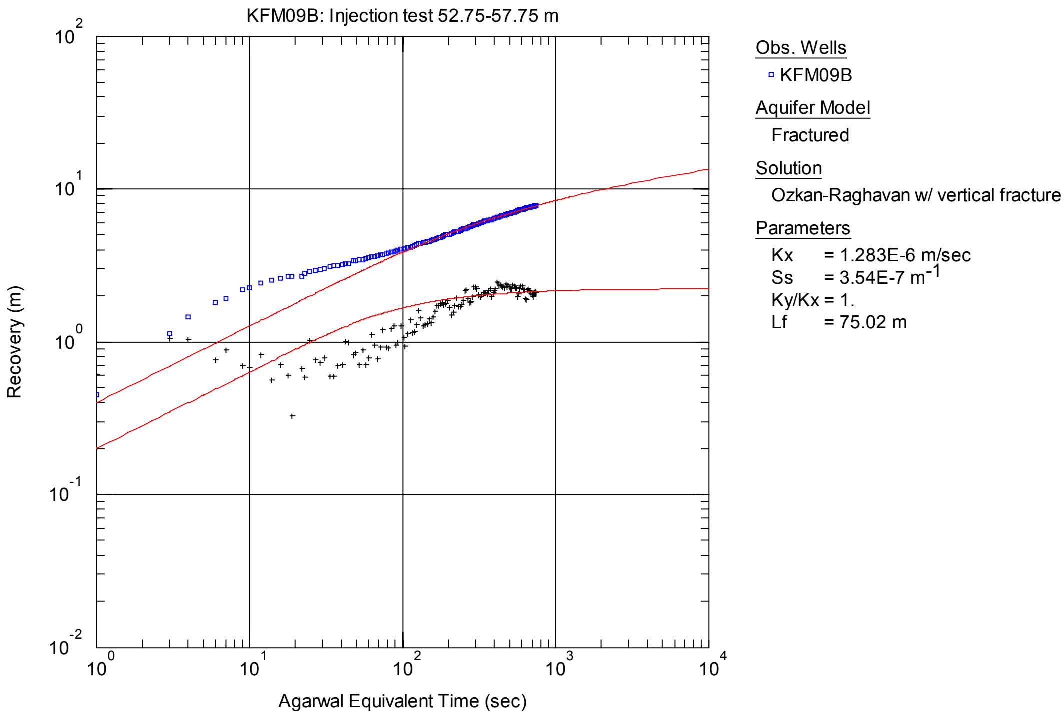


Figure A3-200. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 52.75-57.75 m in KFM09B.*

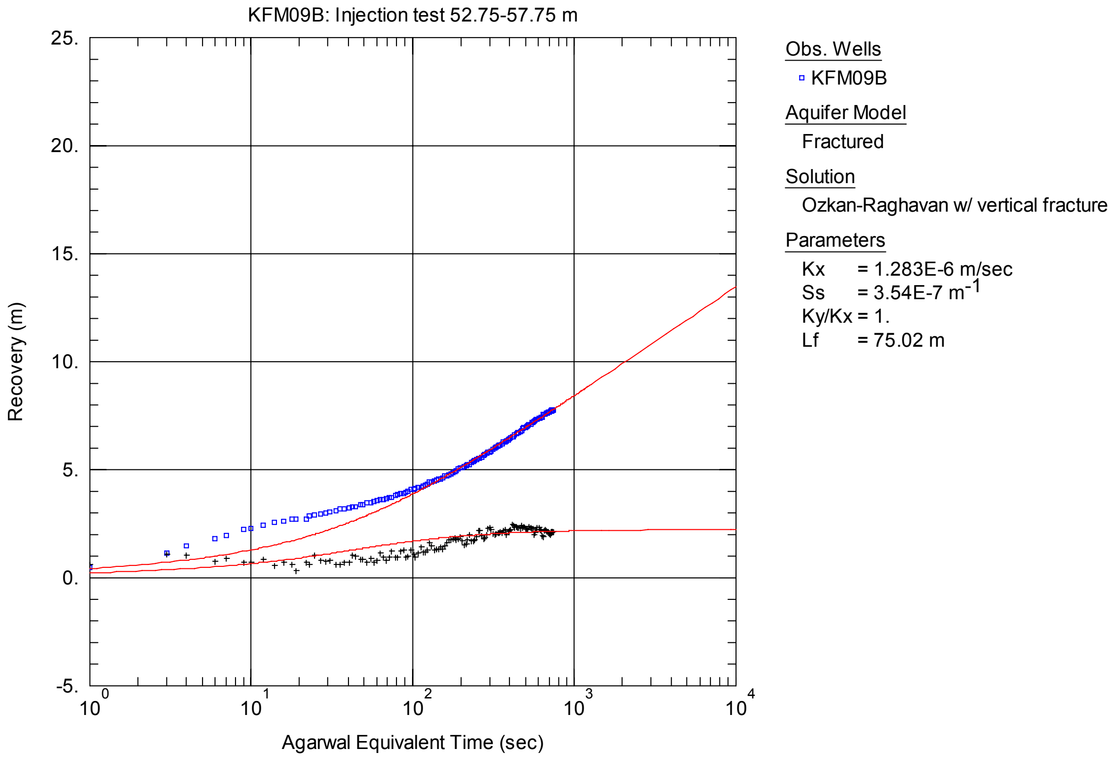


***Figure A3-201.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 52.75-57.75 m in KFM09B.*

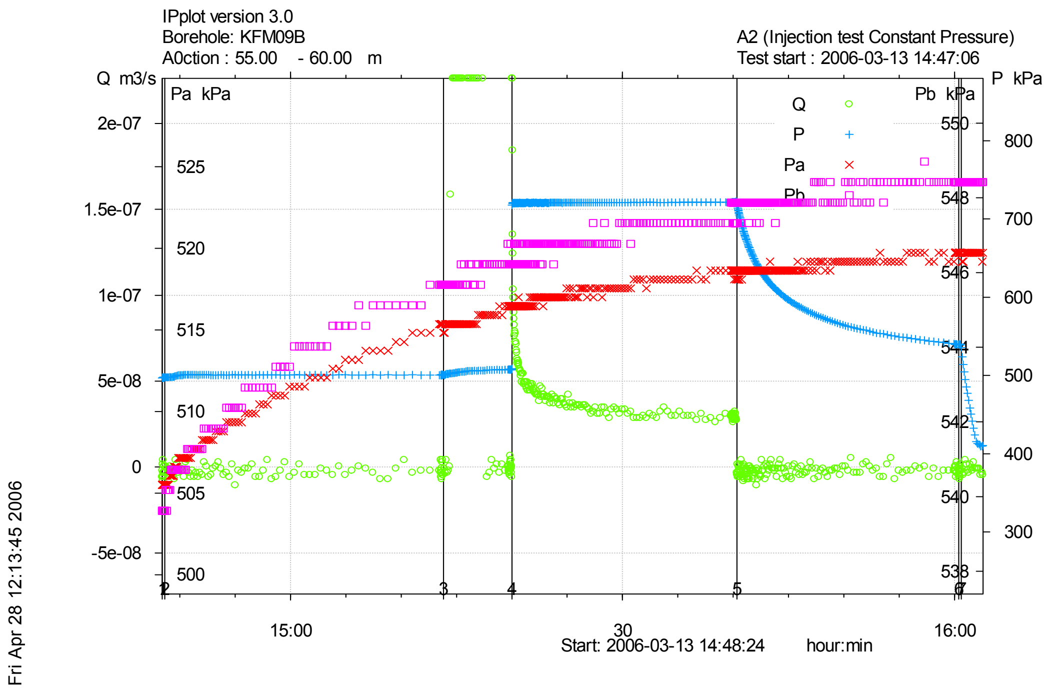


***Figure A3-202.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 55.0-60.0 m in borehole KFM09B.*

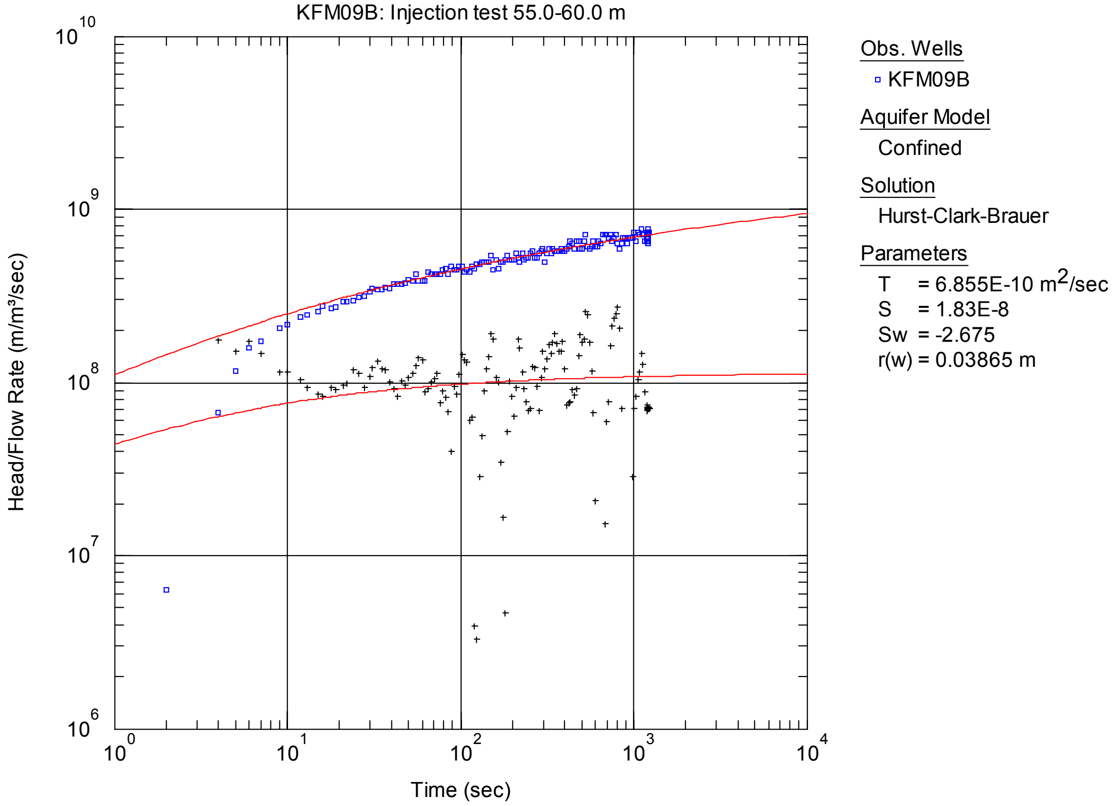


Figure A3-203. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 55.0-60.0 m in KFM09B.*

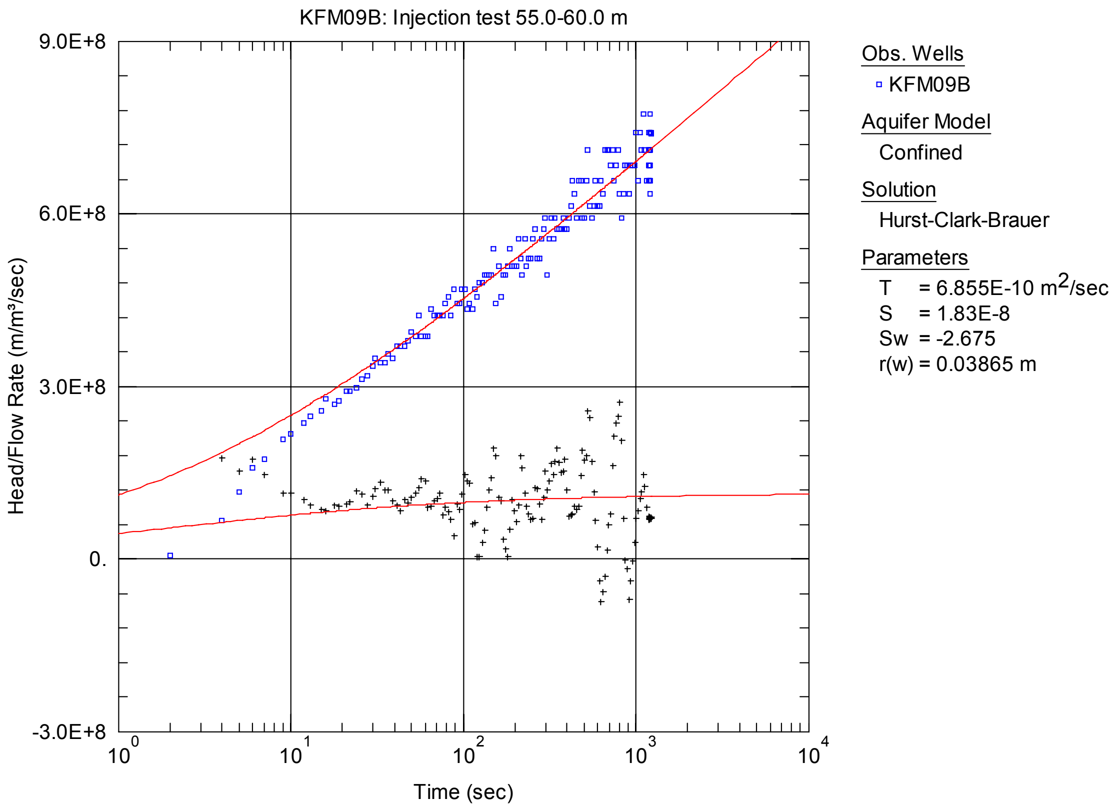


Figure A3-204. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 55.0-60.0 m in KFM09B.*

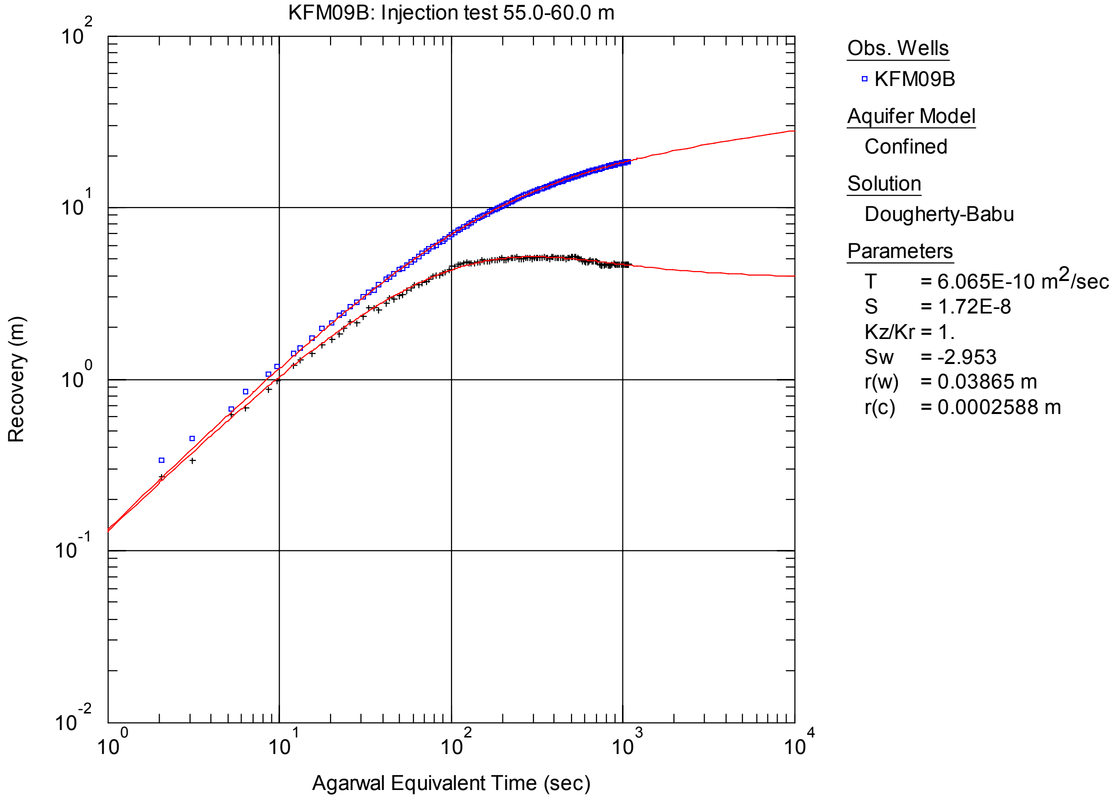


Figure A3-205. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 55.0-60.0 m in KFM09B.*

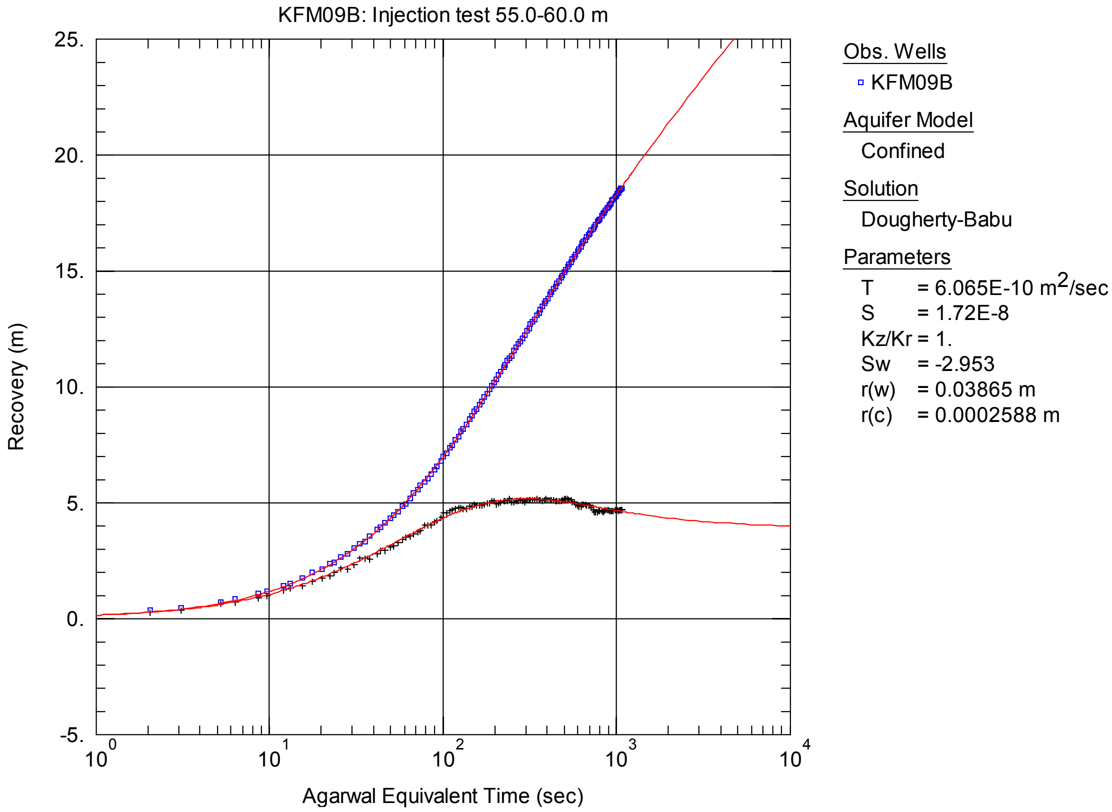


Figure A3-206. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 55.0-60.0 m in KFM09B.*

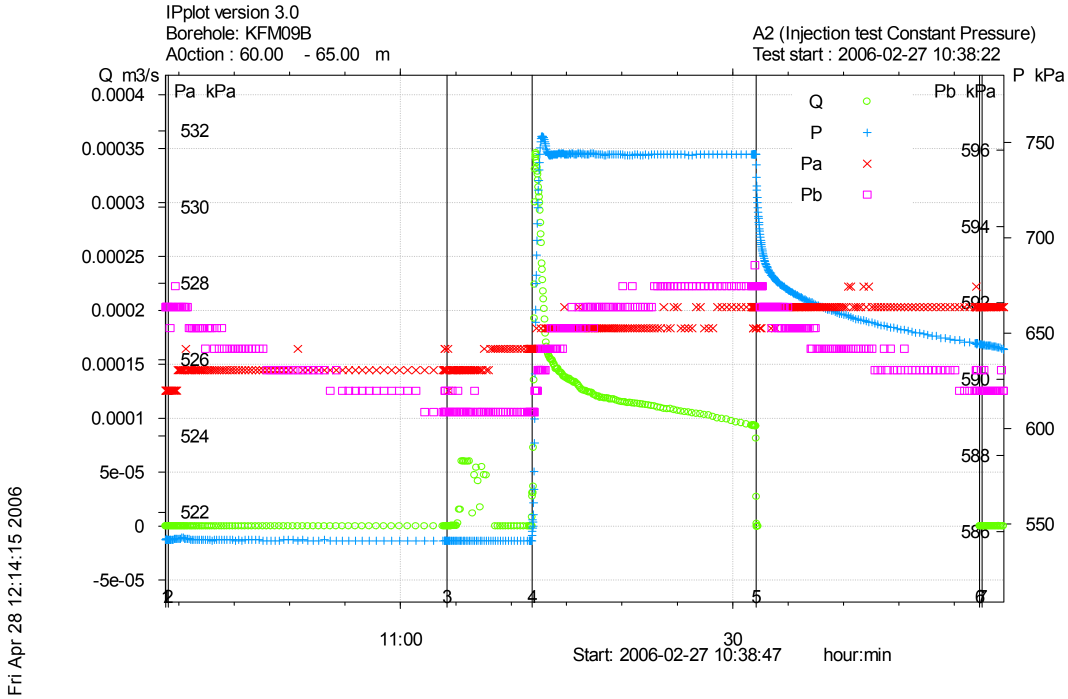


Figure A3-207. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 60.0-65.0 m in borehole KFM09B.

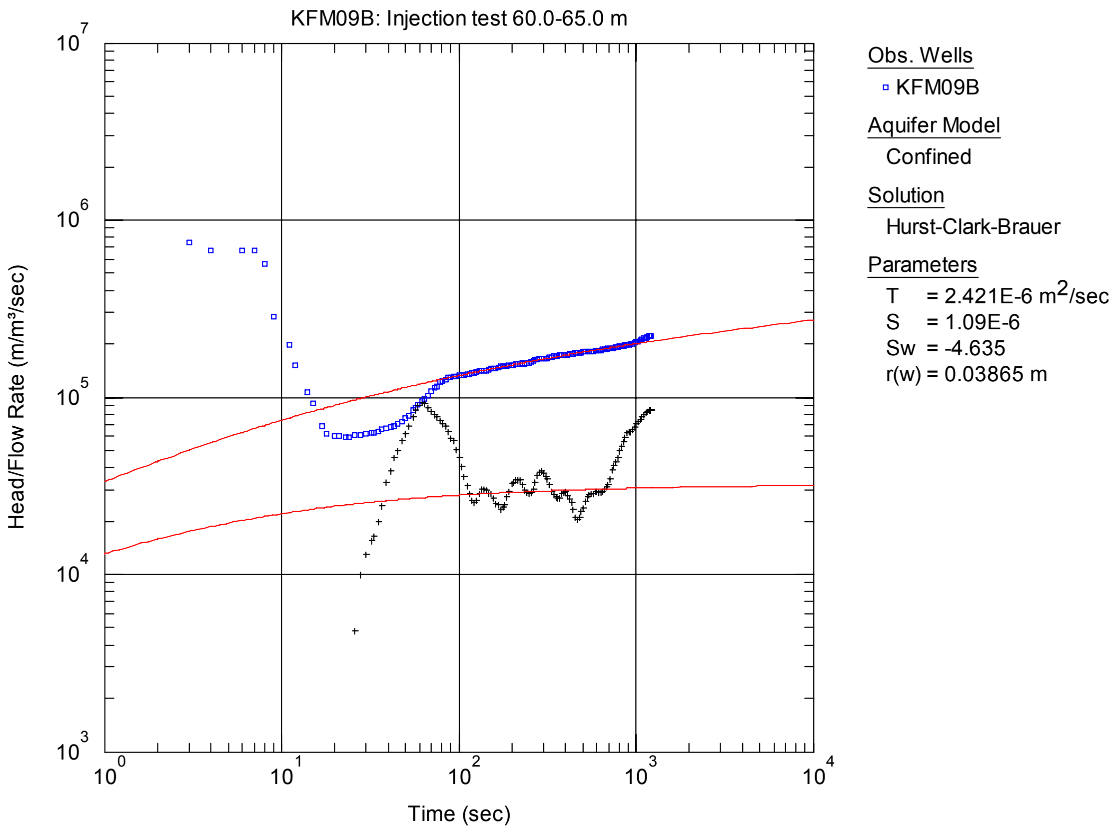


Figure A3-208. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 60.0-65.0 m in KFM09B.

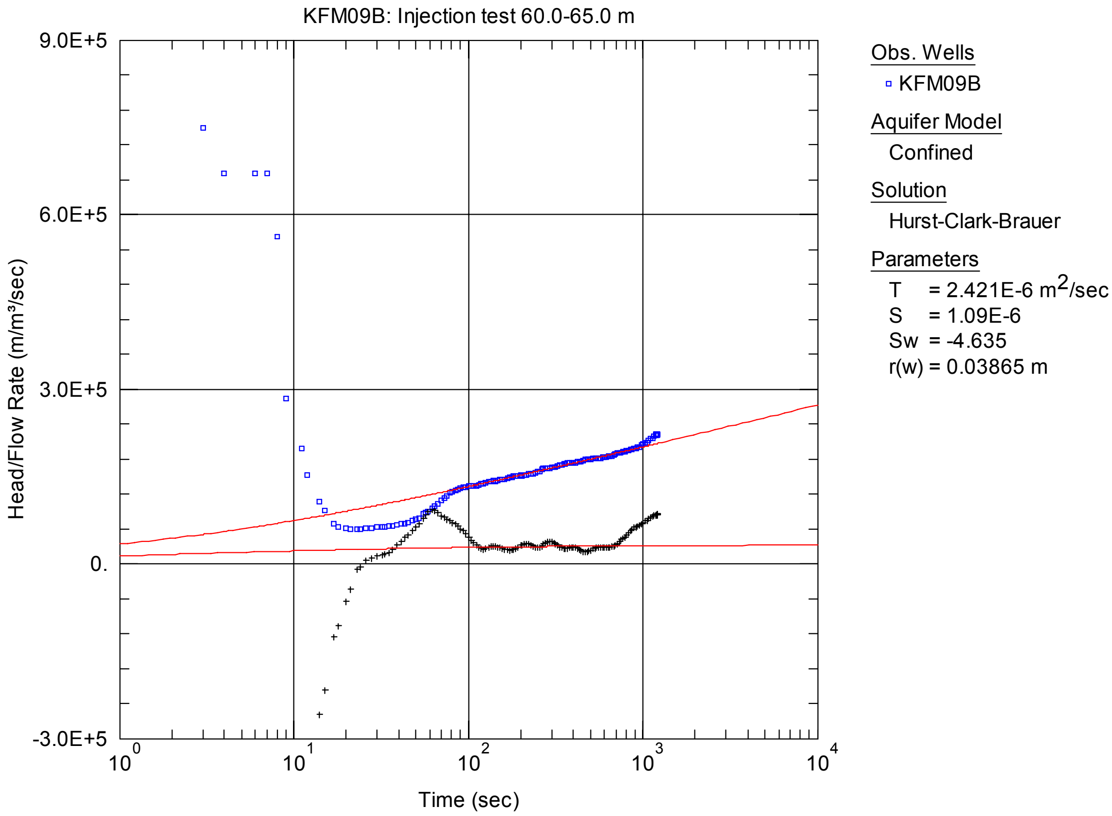


***Figure A3-209.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 60.0-65.0 m in KFM09B.*

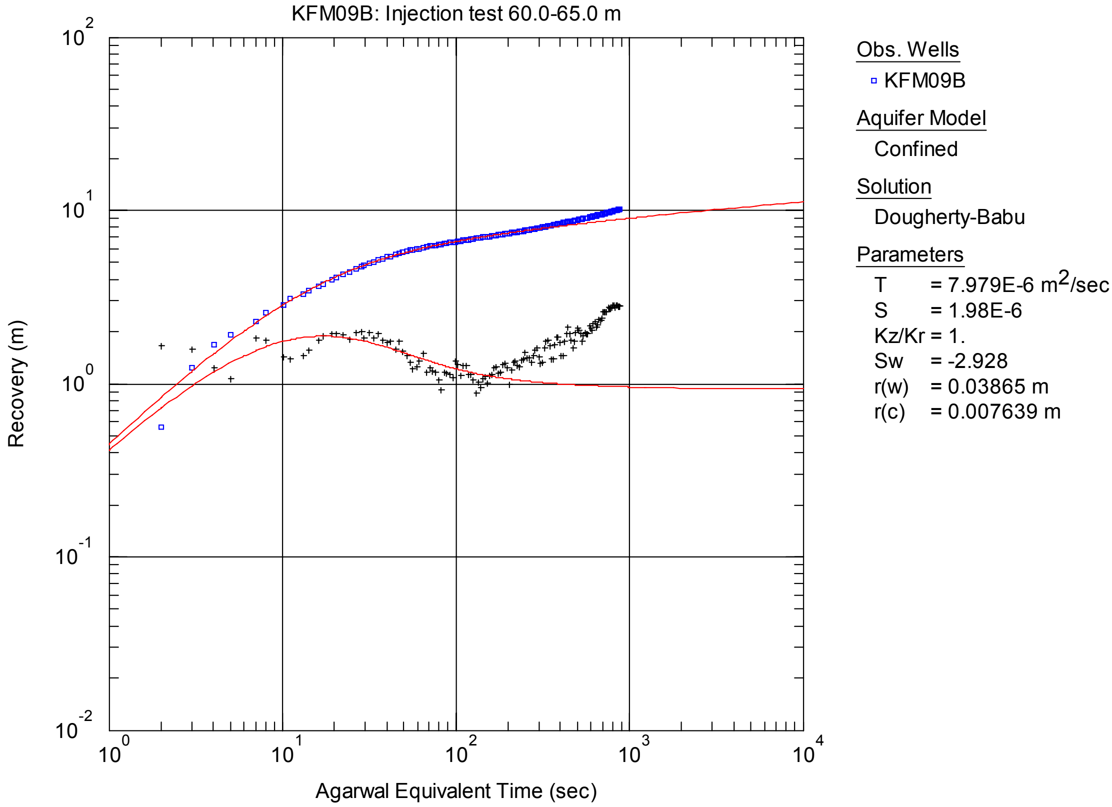


***Figure A3-210.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 60.0-65.0 m in KFM09B.*

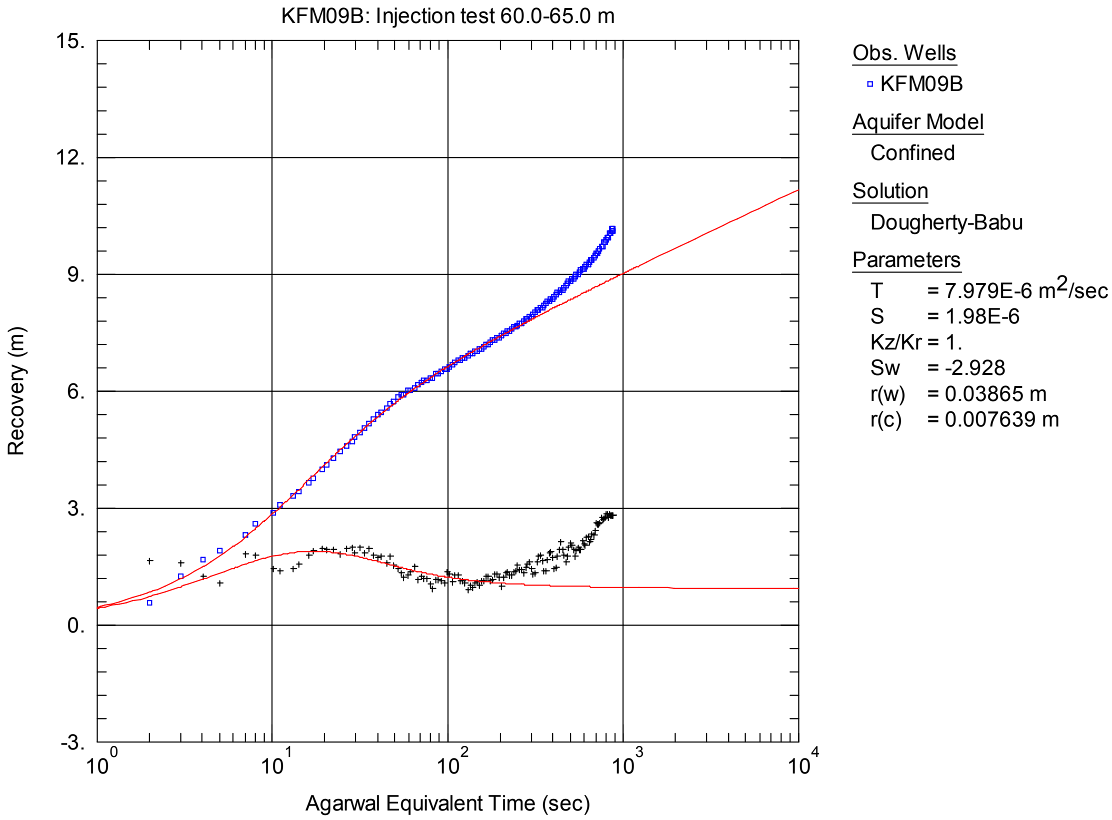


Figure A3-211. Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 60.0-65.0 m in KFM09B.

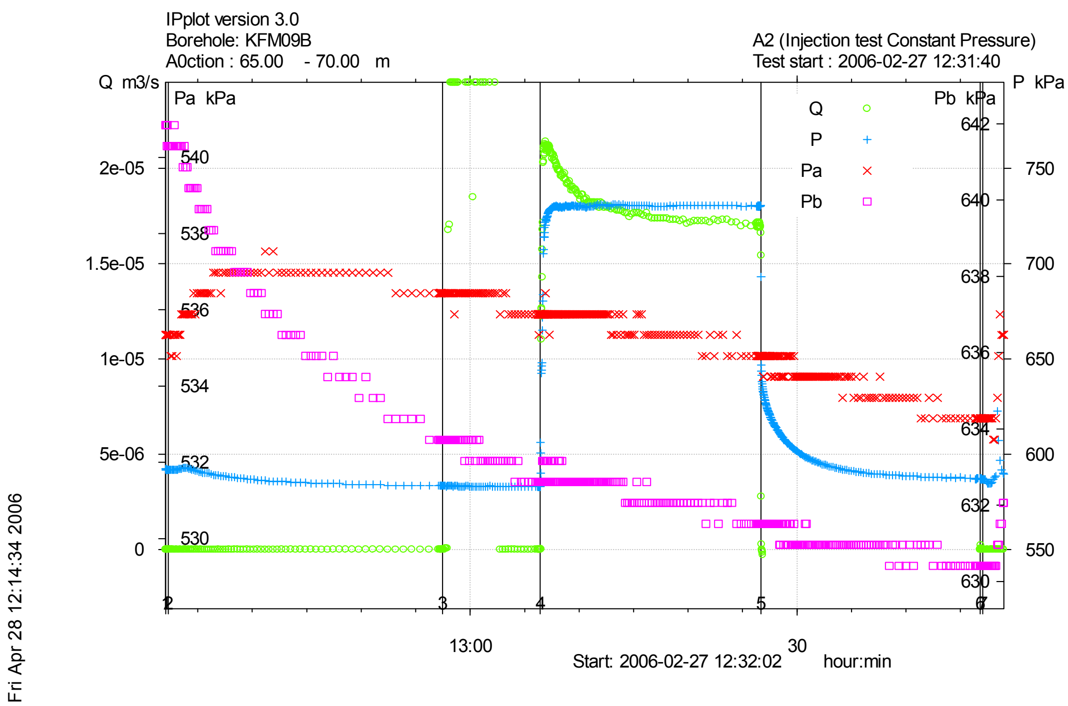


Figure A3-212. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 65.0-70.0 m in borehole KFM09B.

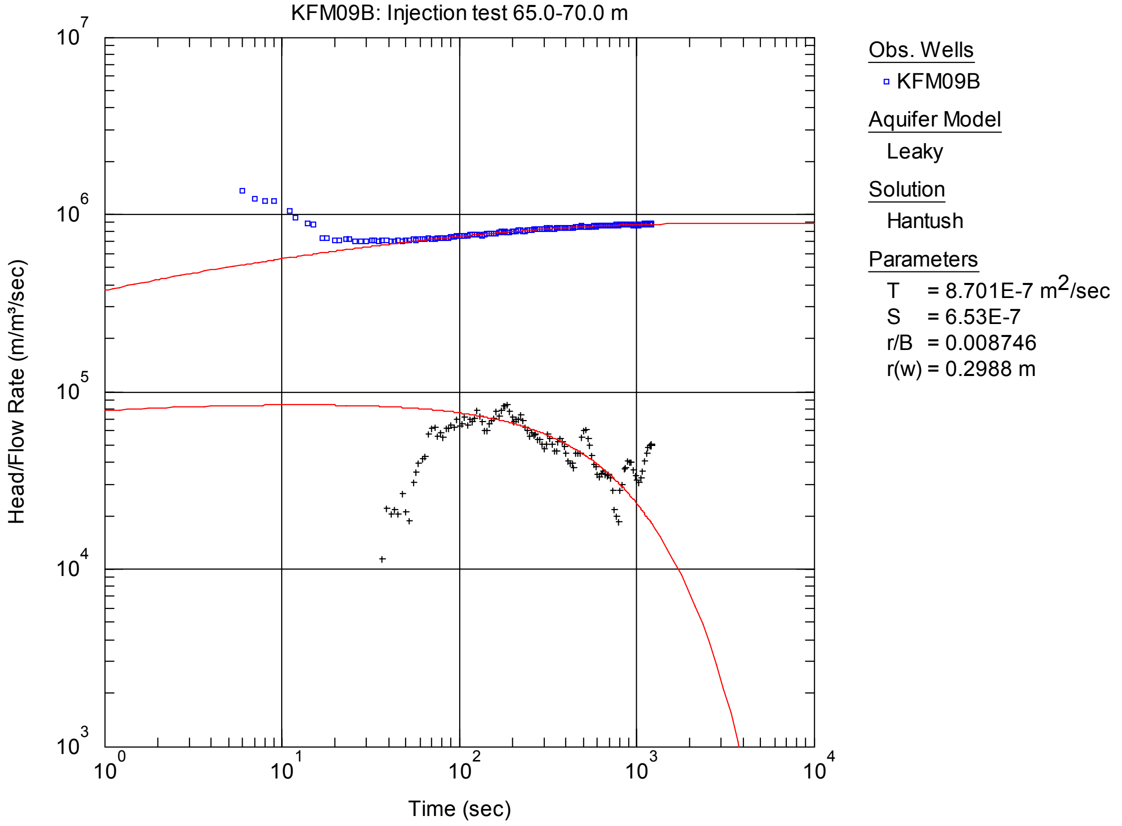


Figure A3-213. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 65.0-70.0 m in KFM09B.*

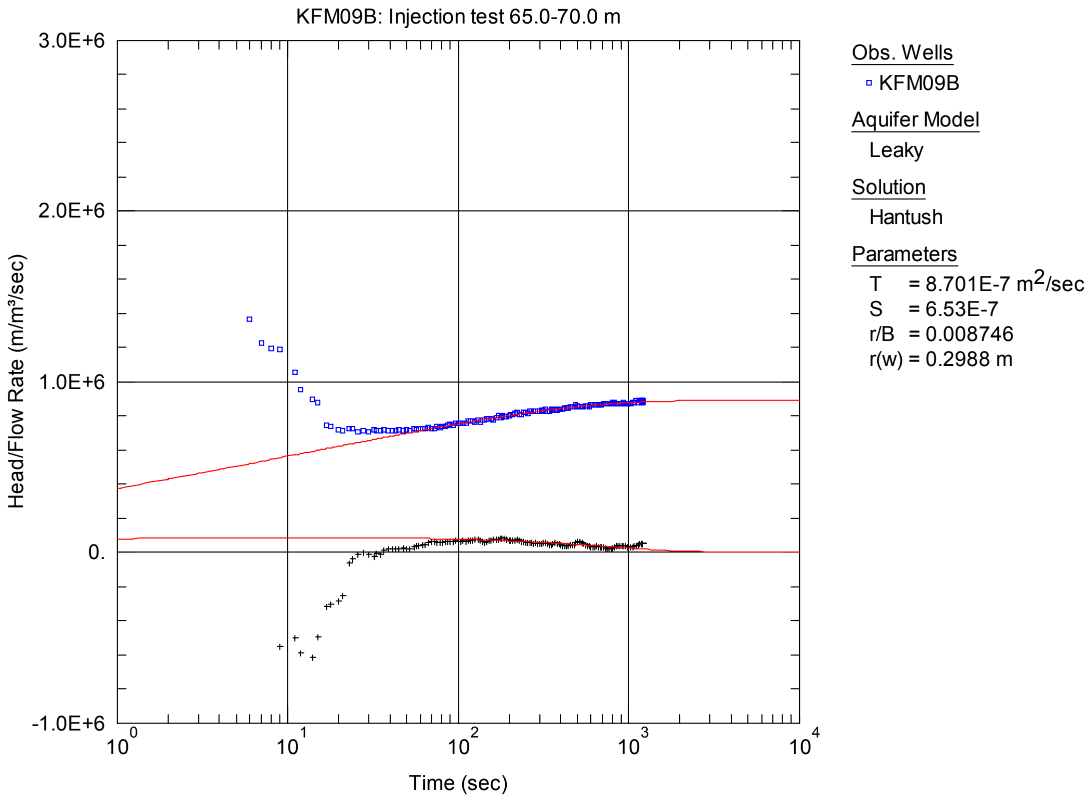


Figure A3-214. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 65.0-70.0 m in KFM09B.*

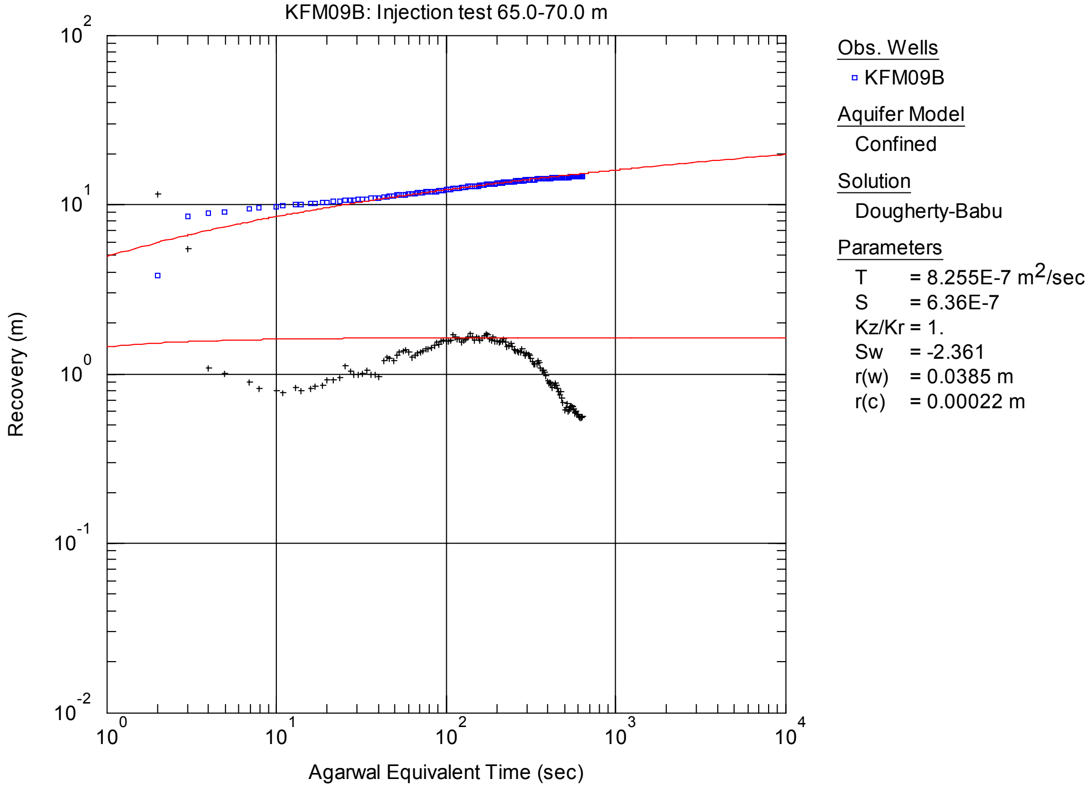


Figure A3-215. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 65.0-70.0 m in KFM09B.*

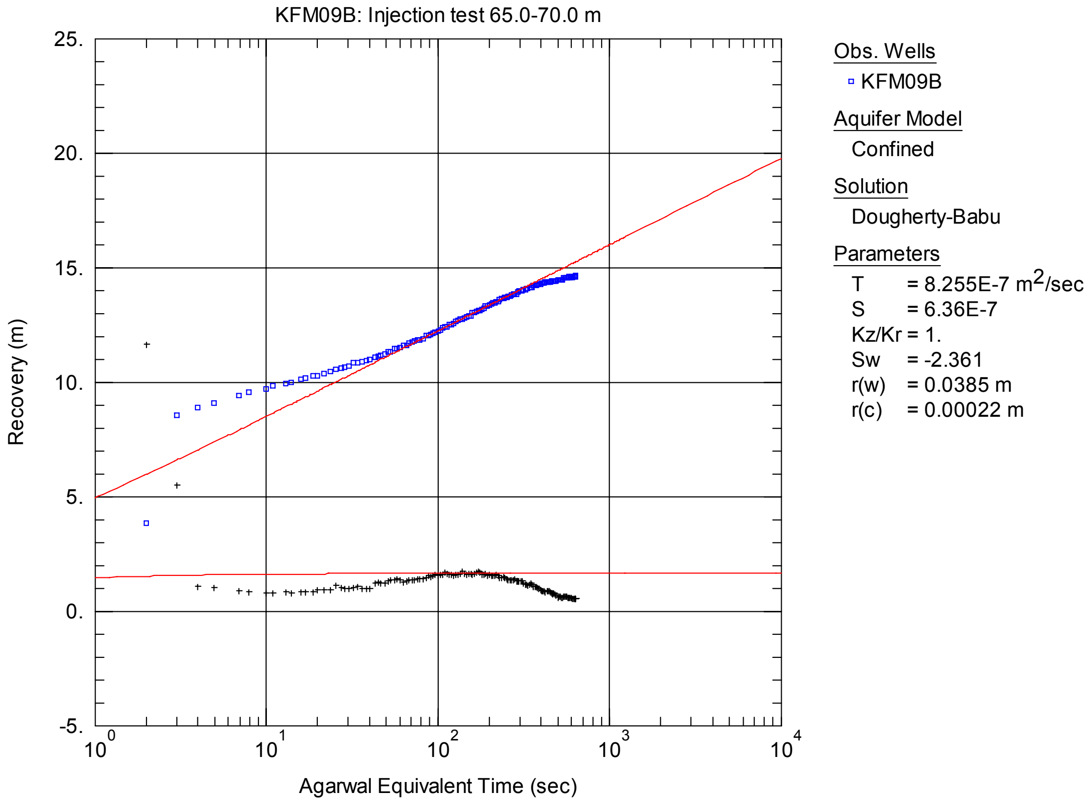


Figure A3-216. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 65.0-70.0 m in KFM09B.*

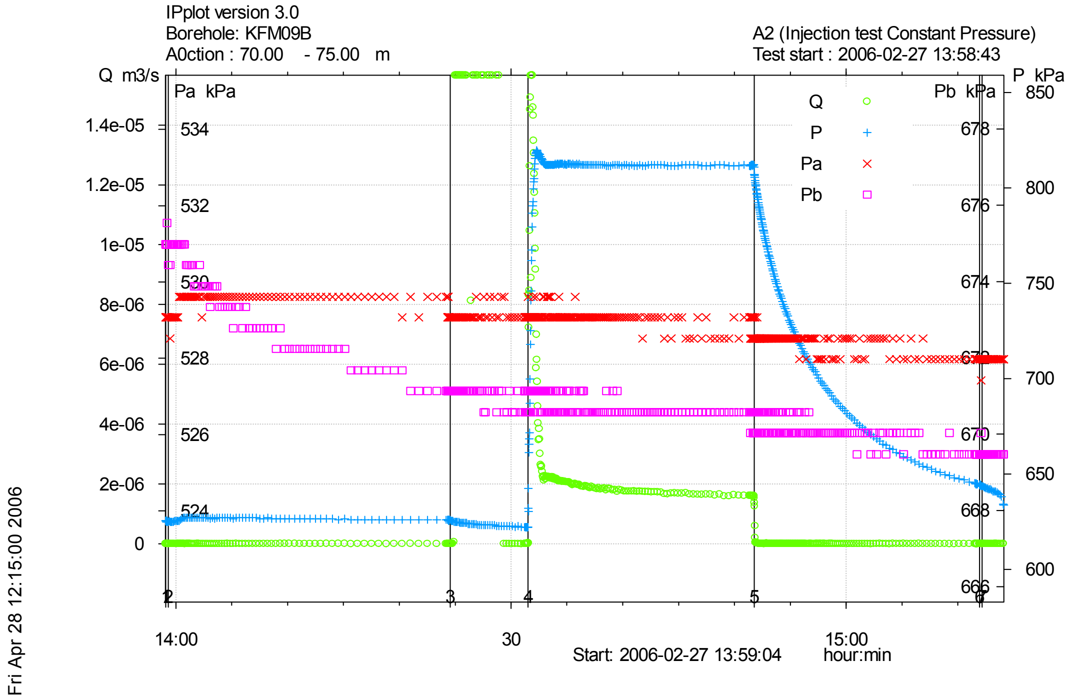


Figure A3-217. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 70.0-75.0 m in borehole KFM09B.

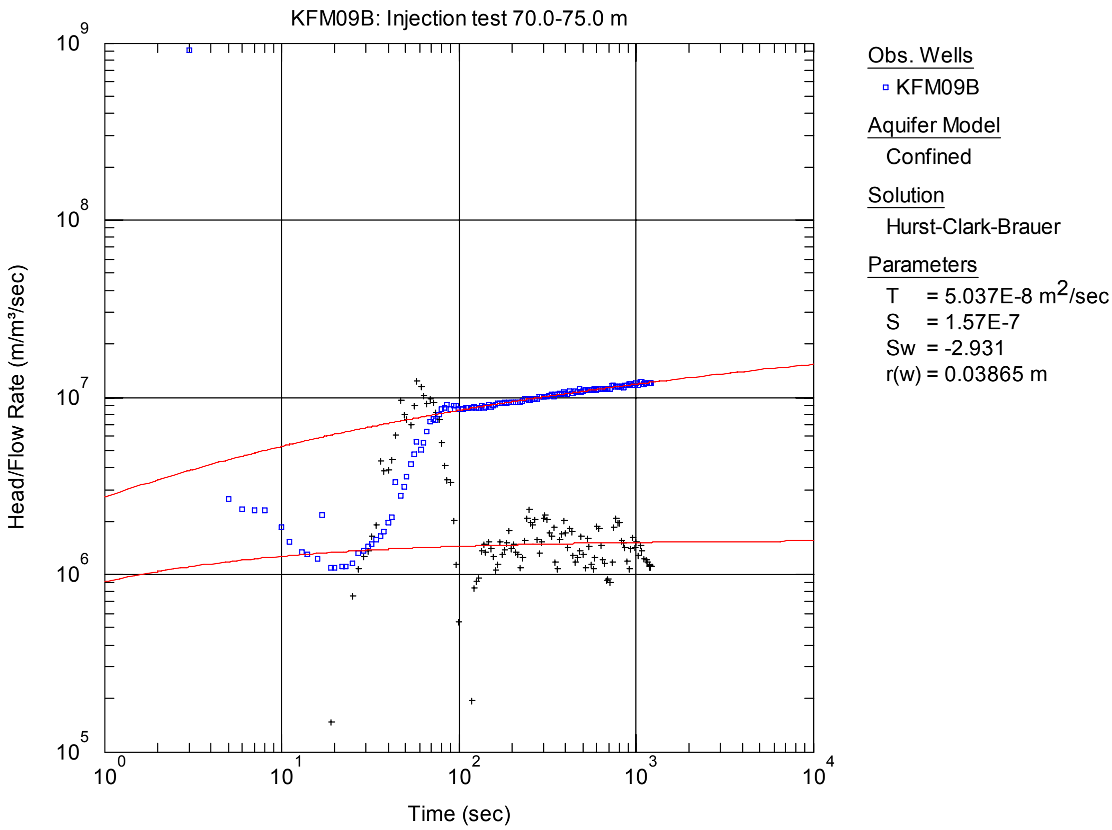


Figure A3-218. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 70.0-75.0 m in KFM09B.

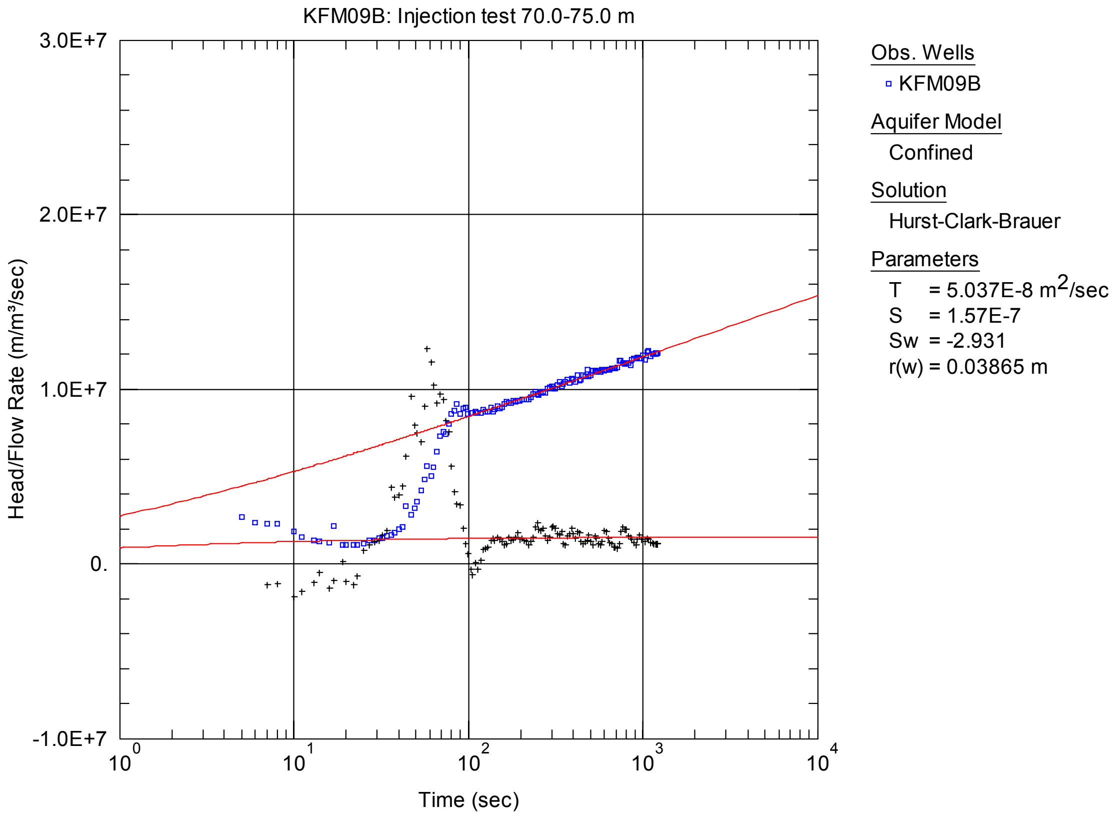


Figure A3-219. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 70.0-75.0 m in KFM09B.*

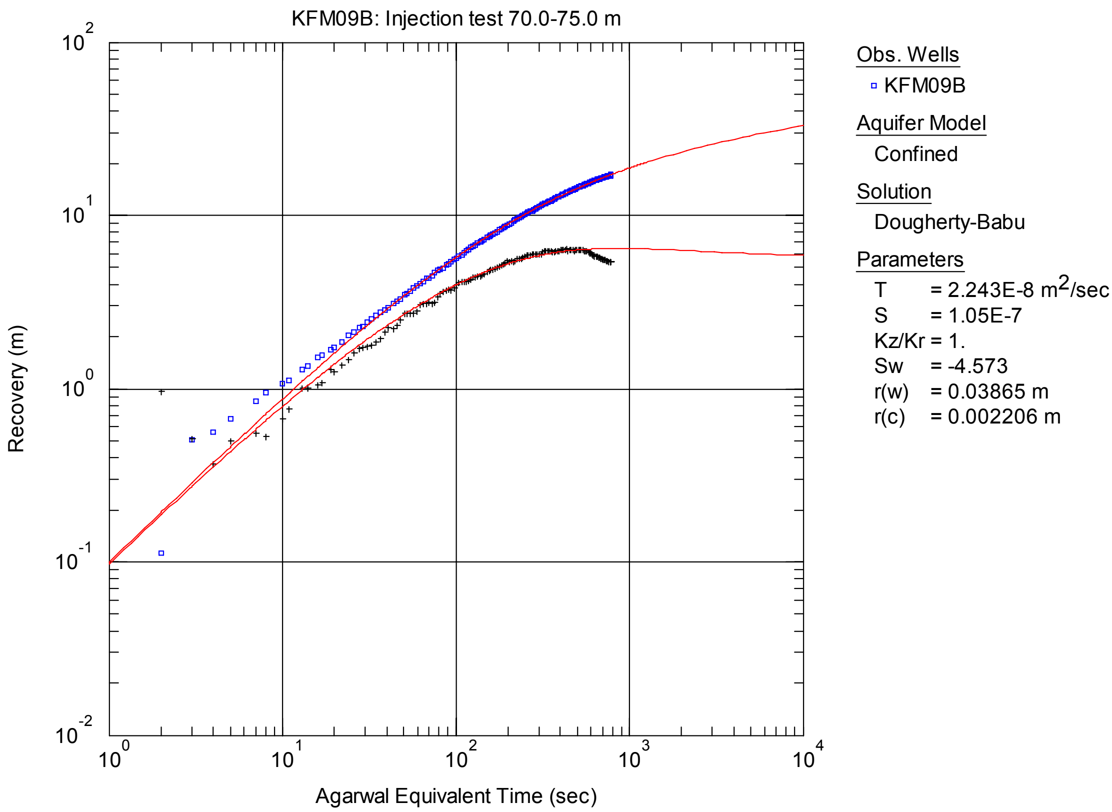


Figure A3-220. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 70.0-75.0 m in KFM09B.*

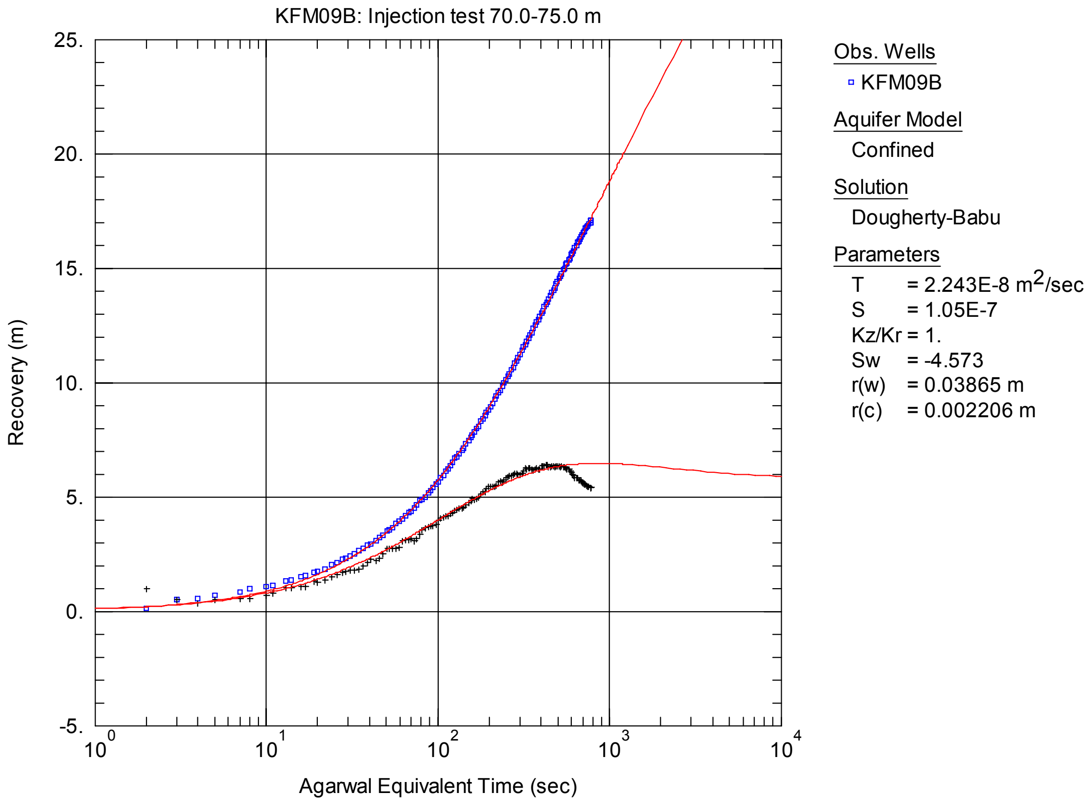


Figure A3-221. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 70.0-75.0 m in KFM09B.*

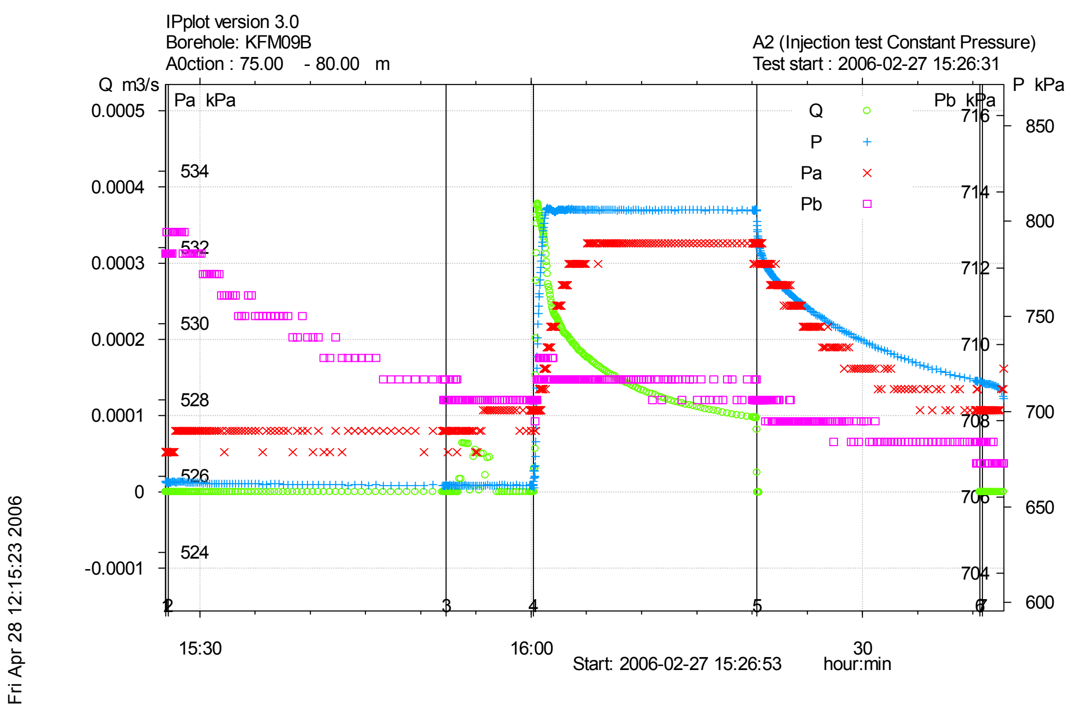


Figure A3-222. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 75.0-80.0 m in borehole KFM09B.*

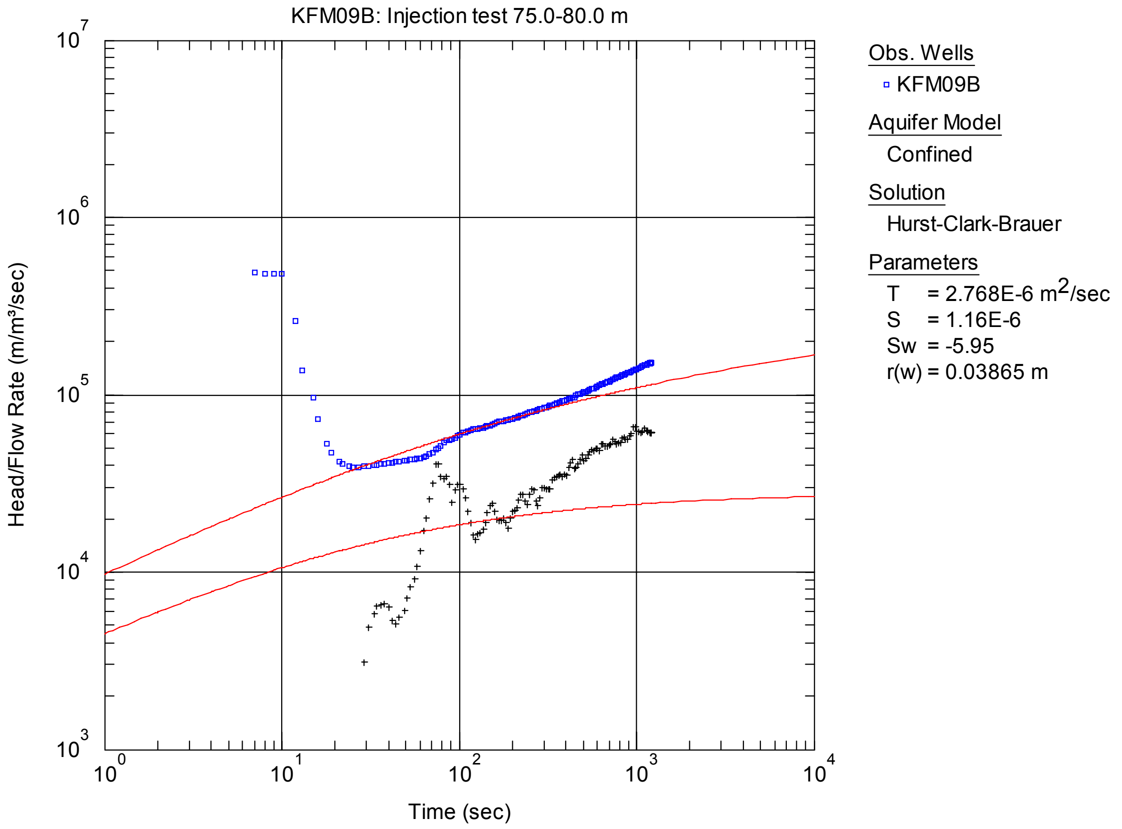


***Figure A3-223.** Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 75.0-80.0 m in KFM09B.*

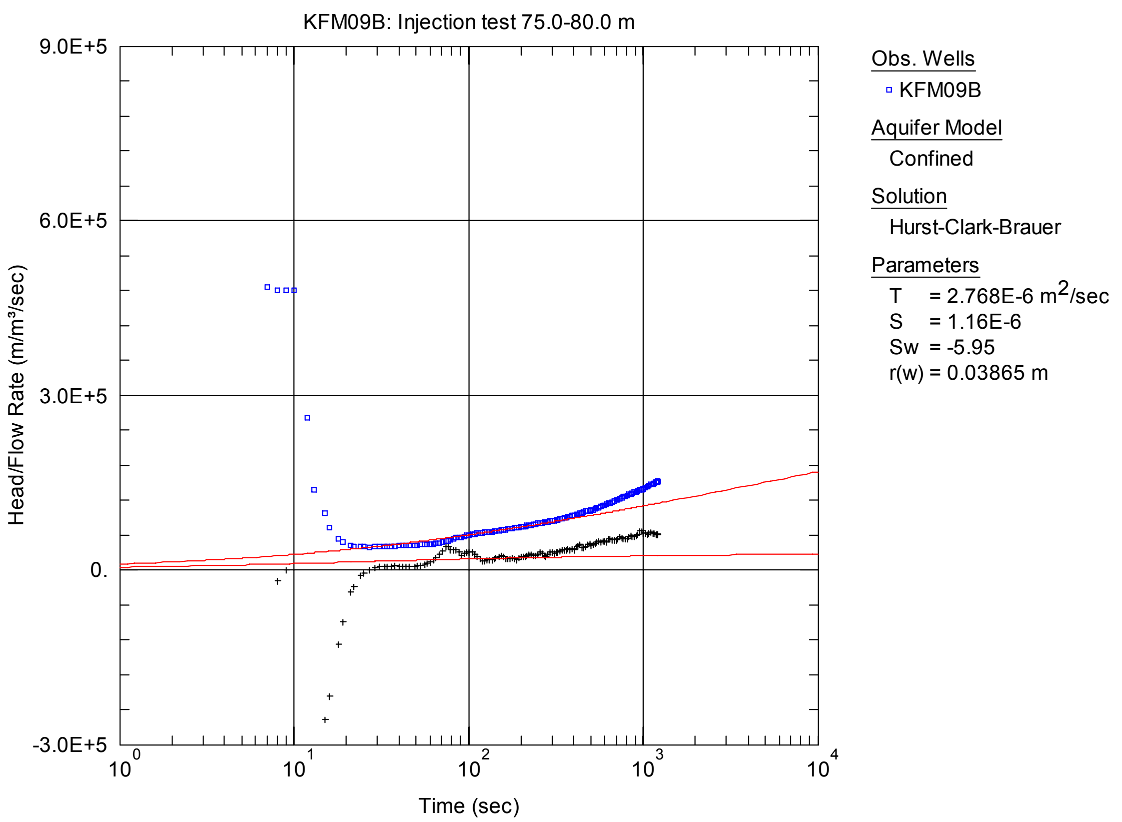


***Figure A3-224.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 75.0-80.0 m in KFM09B.*

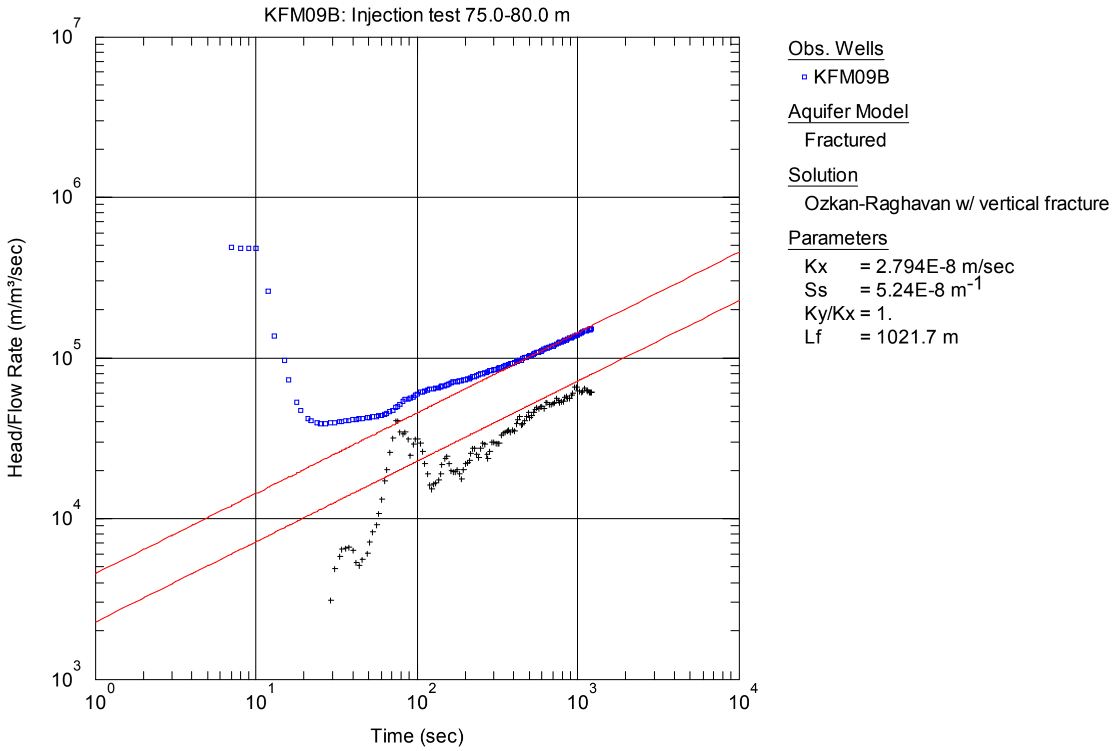


Figure A3-225. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 75.0-80.0 m in KFM09B.*

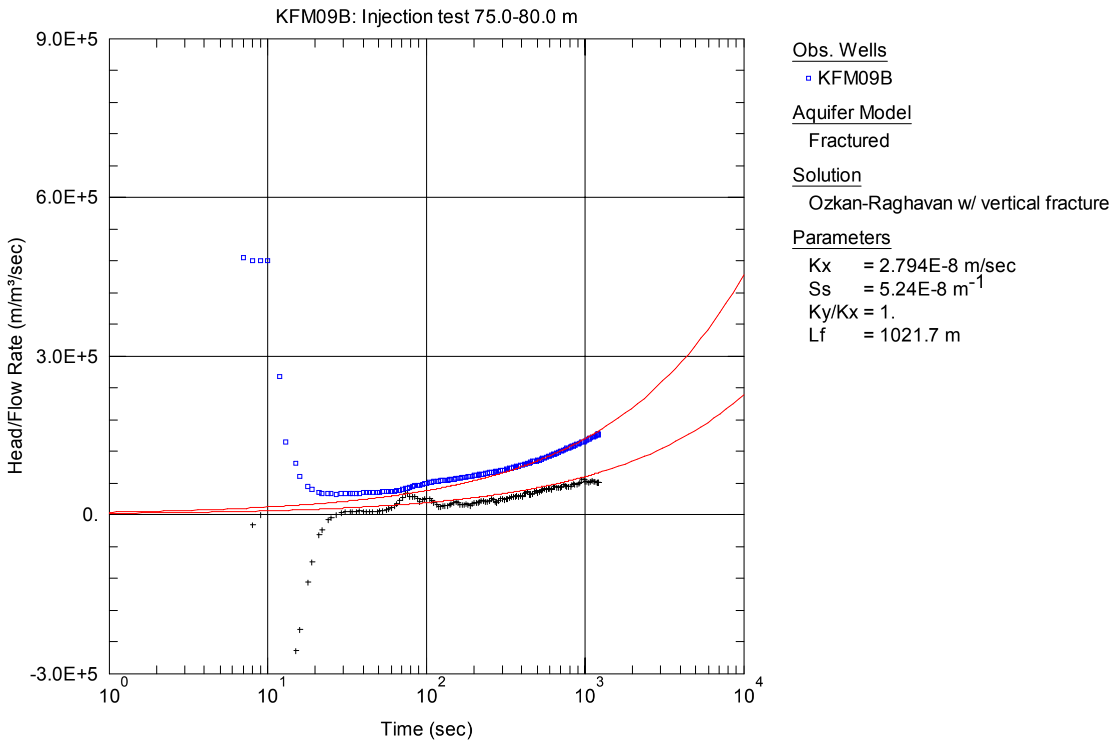


Figure A3-226. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 75.0-80.0 m in KFM09B.*

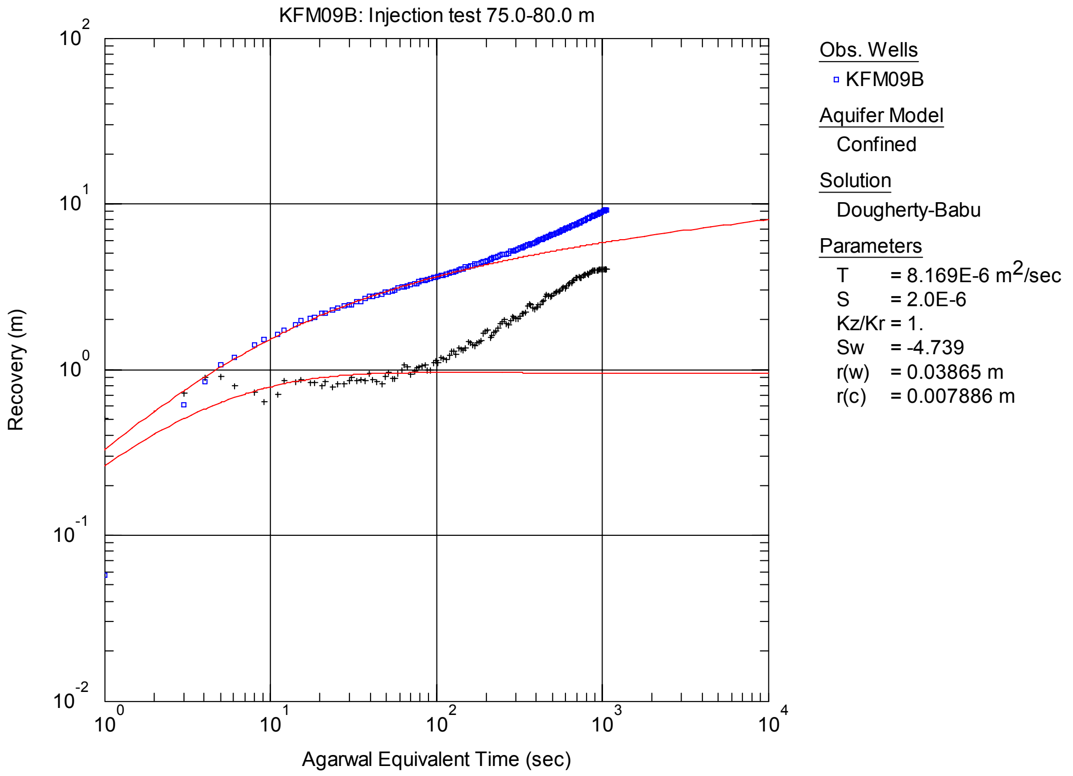


Figure A3-227. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 75.0-80.0 m in KFM09B.*

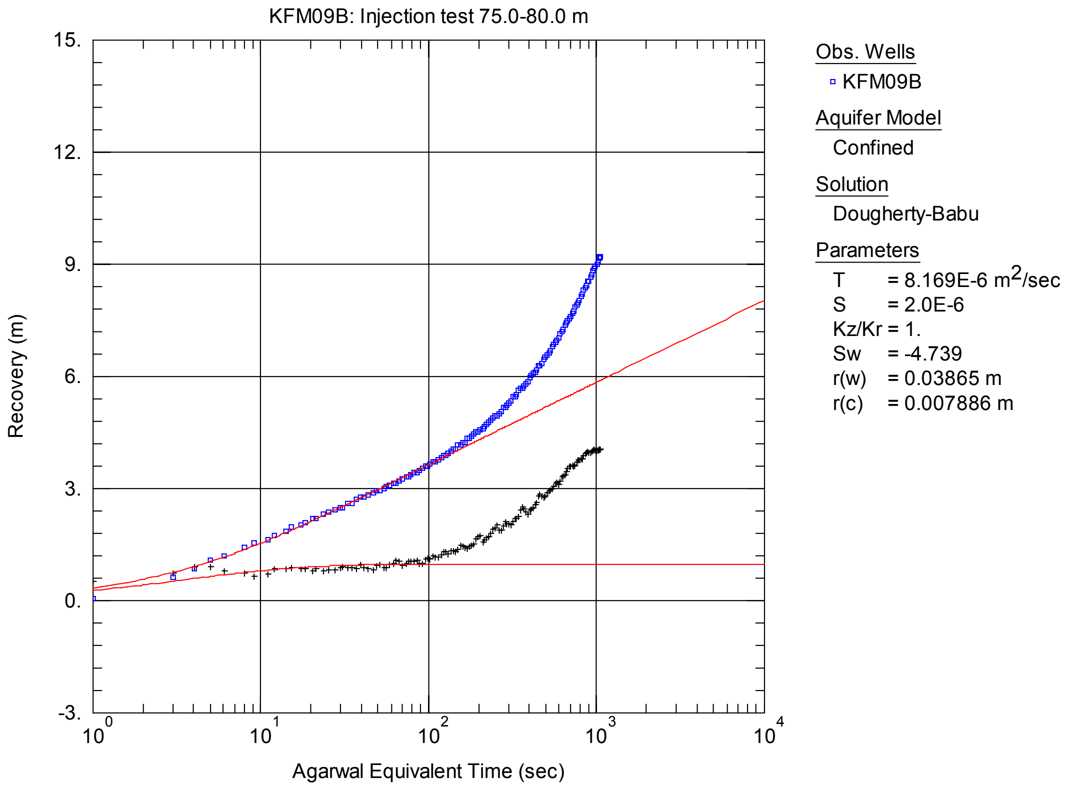


Figure A3-228. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Dougherty-Babu solution, from the injection test in section 75.0-80.0 m in KFM09B.*

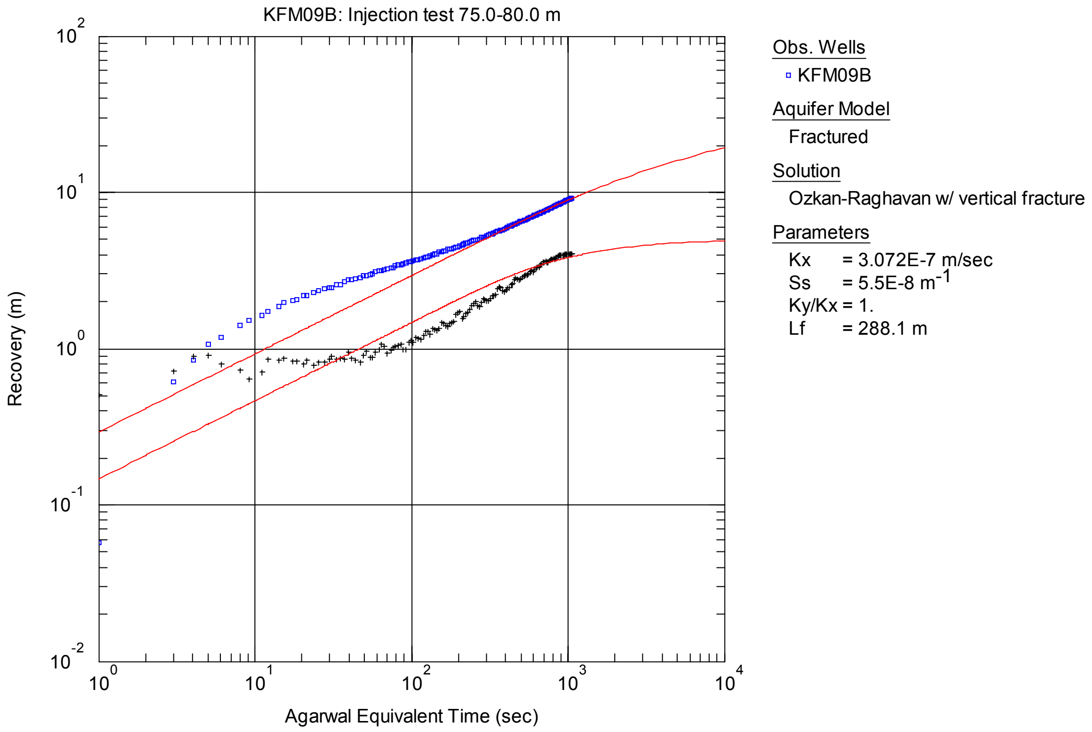


Figure A3-229. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 75.0-80.0 m in KFM09B.*

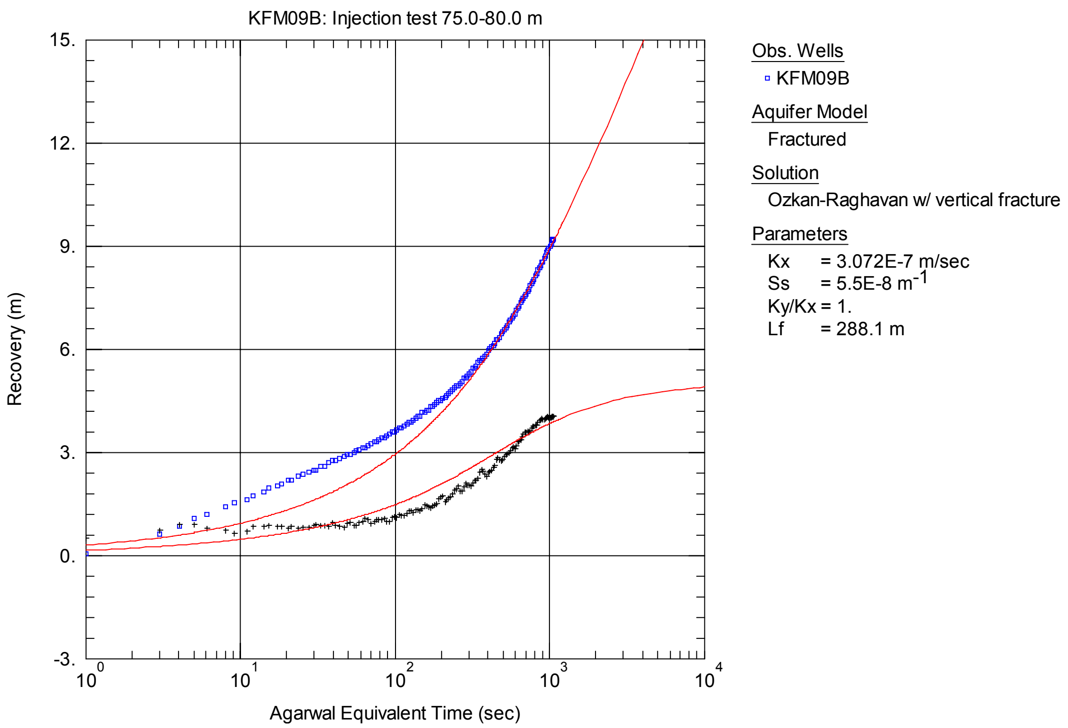


Figure A3-230. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 75.0-80.0 m in KFM09B.*

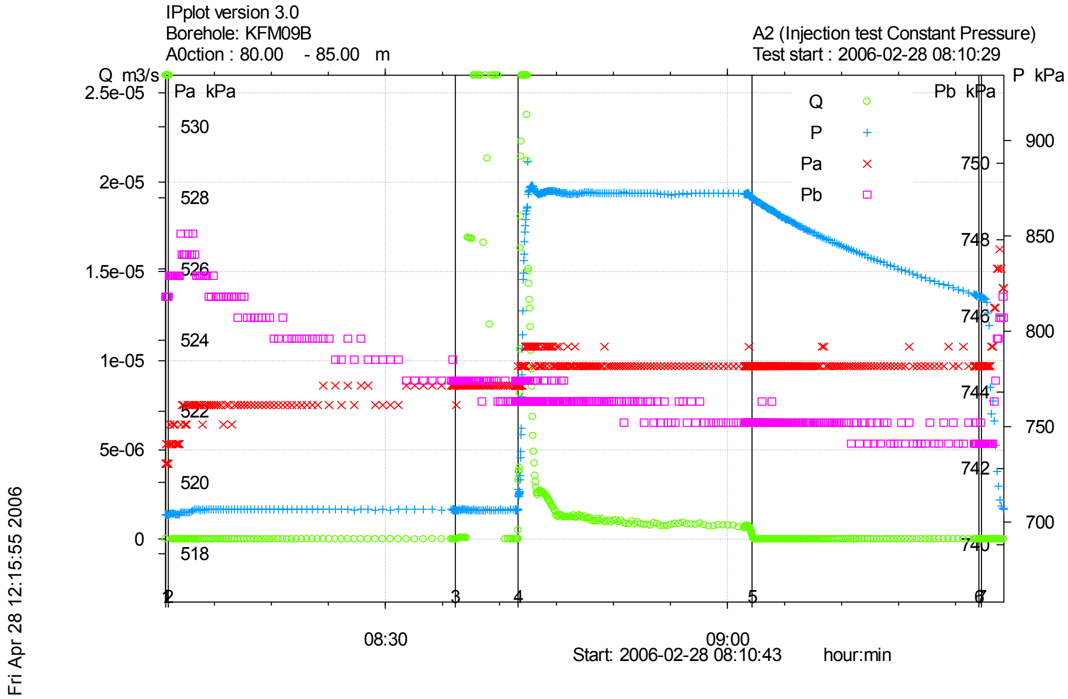


Figure A3-231. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 80.0-85.0 m in borehole KFM09B.*

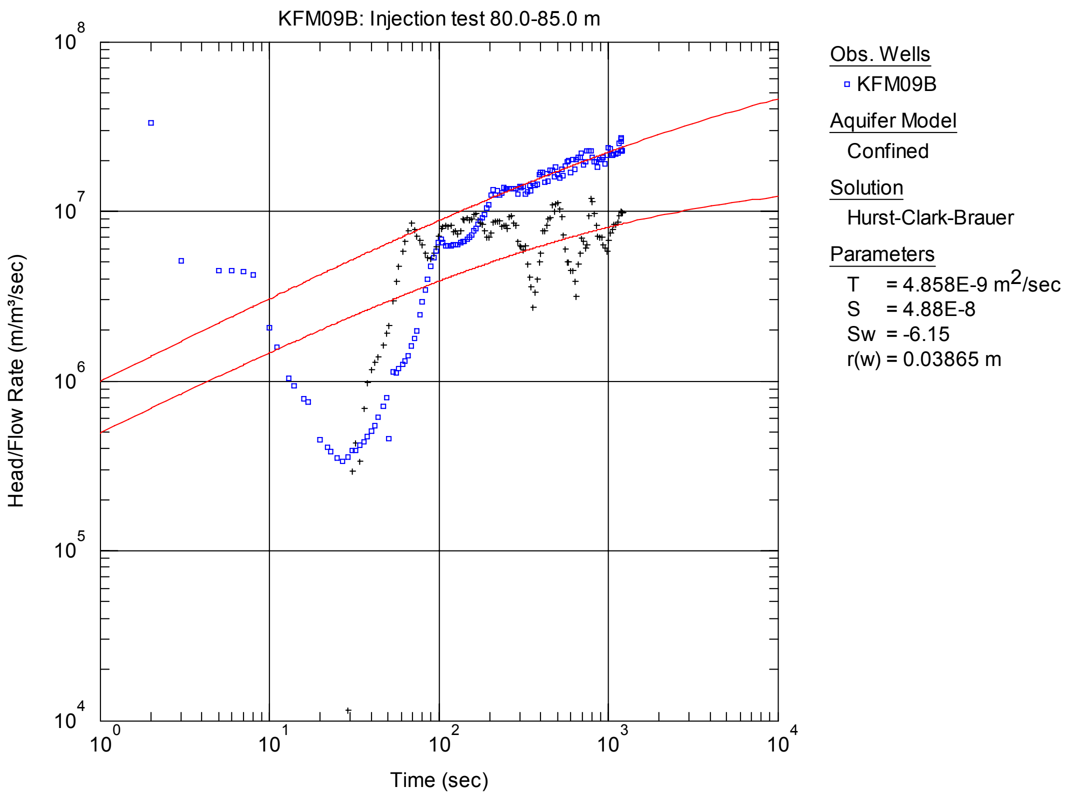


Figure A3-232. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 80.0-85.0 m in KFM09B.*

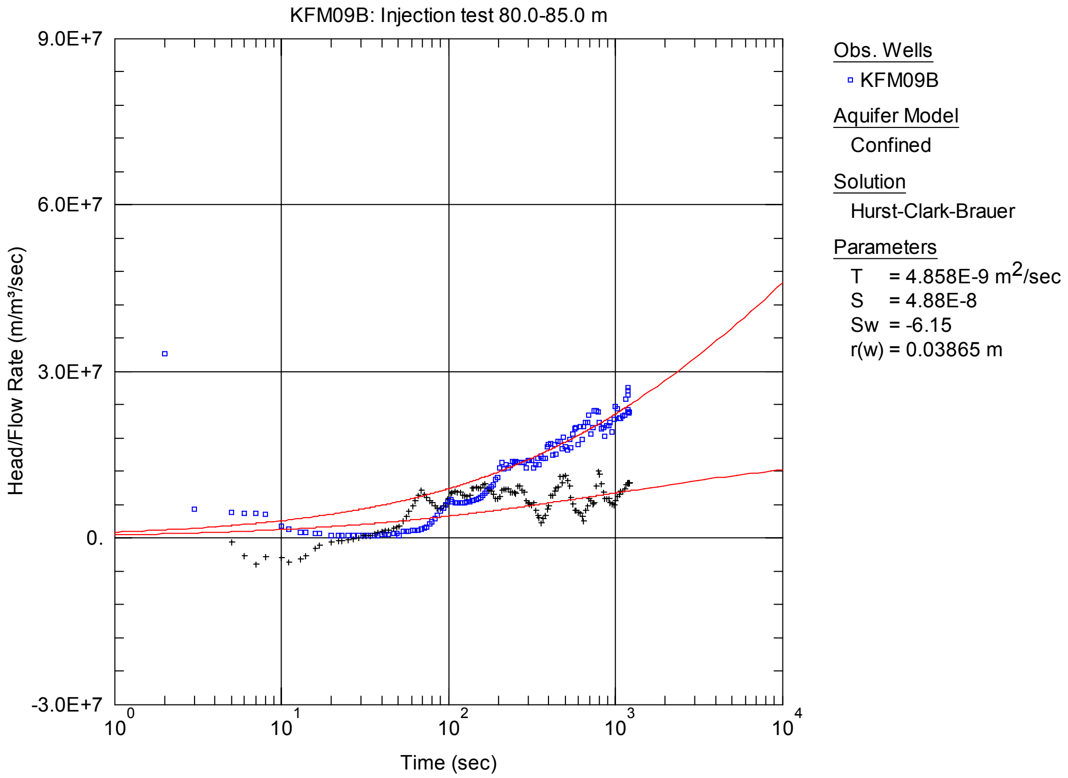


Figure A3-233. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 80.0-85.0 m in KFM09B.*

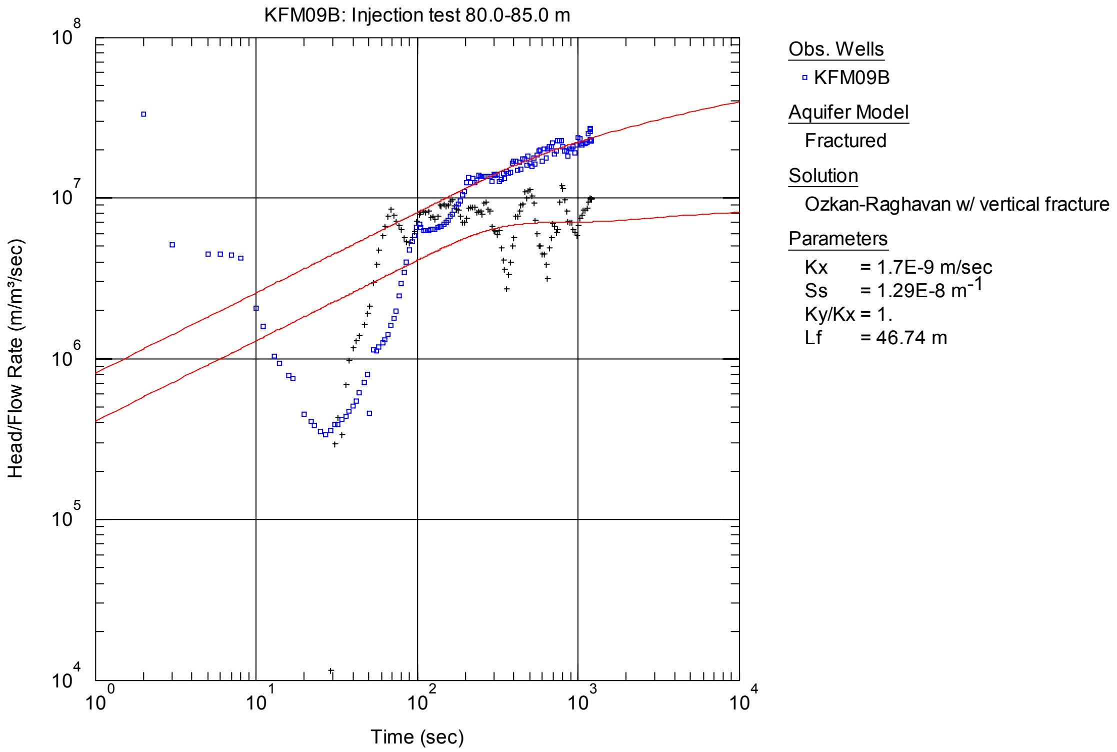


Figure A3-234. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 80.0-85.0 m in KFM09B.*

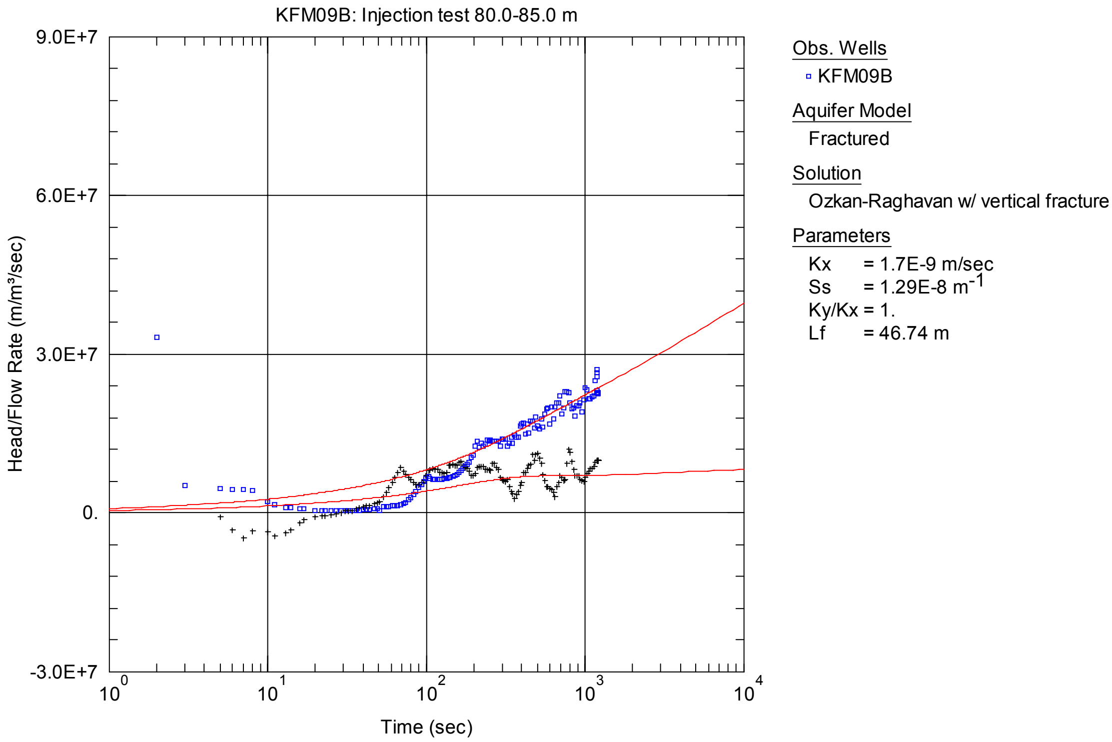


Figure A3-235. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 80.0-85.0 m in KFM09B.*

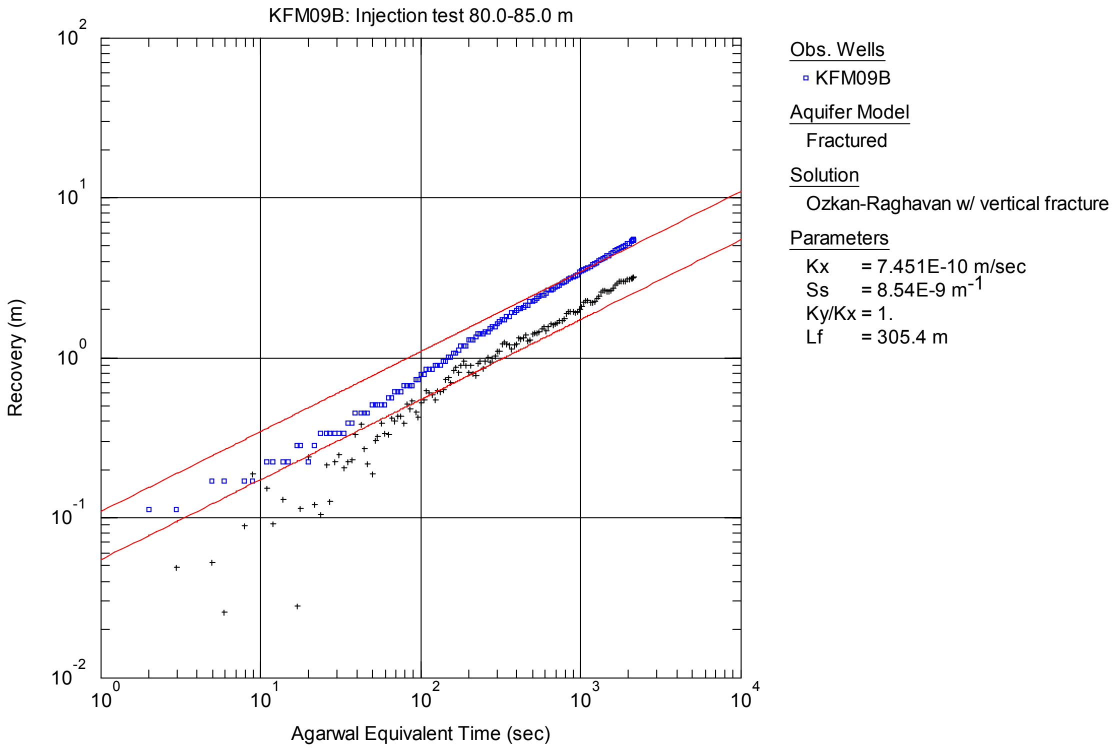


Figure A3-236. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 80.0-85.0 m in KFM09B.*

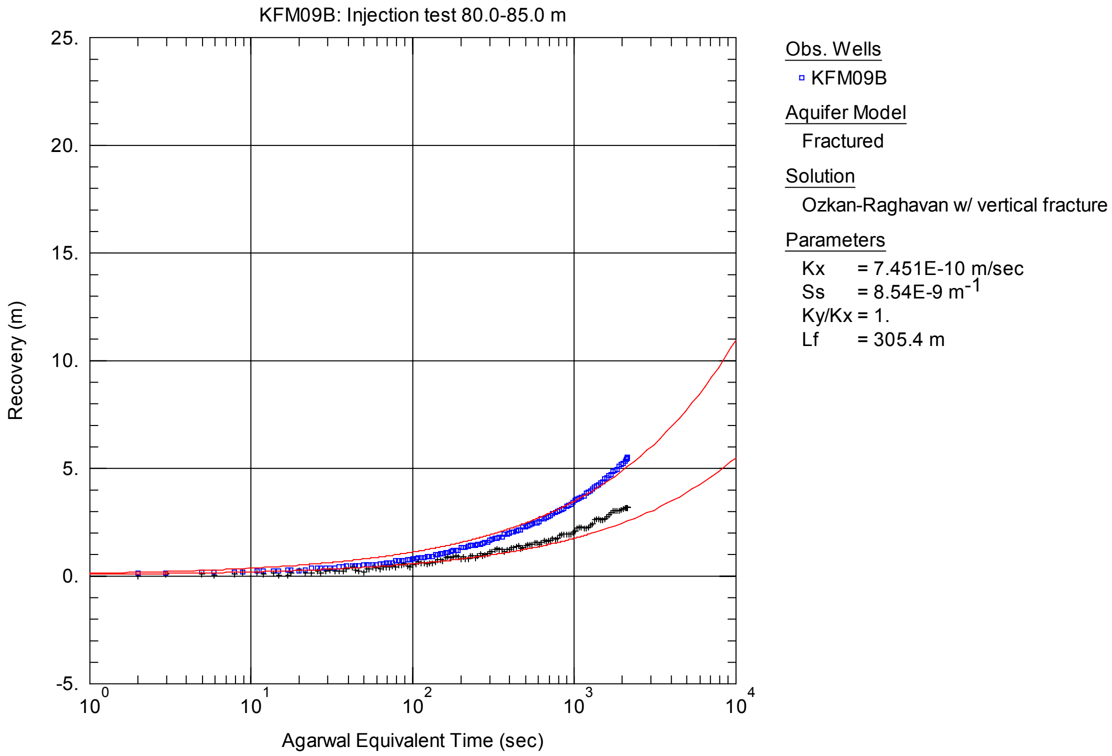


Figure A3-237. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 80.0-85.0 m in KFM09B.*

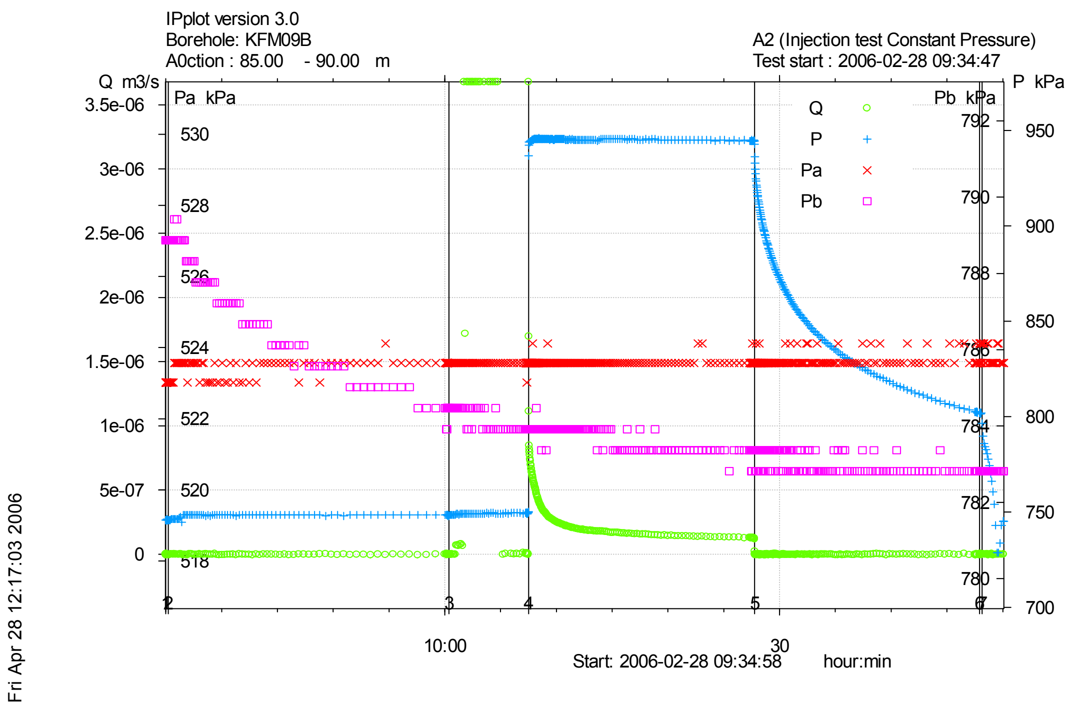


Figure A3-238. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 85.0-90.0 m in borehole KFM09B.*

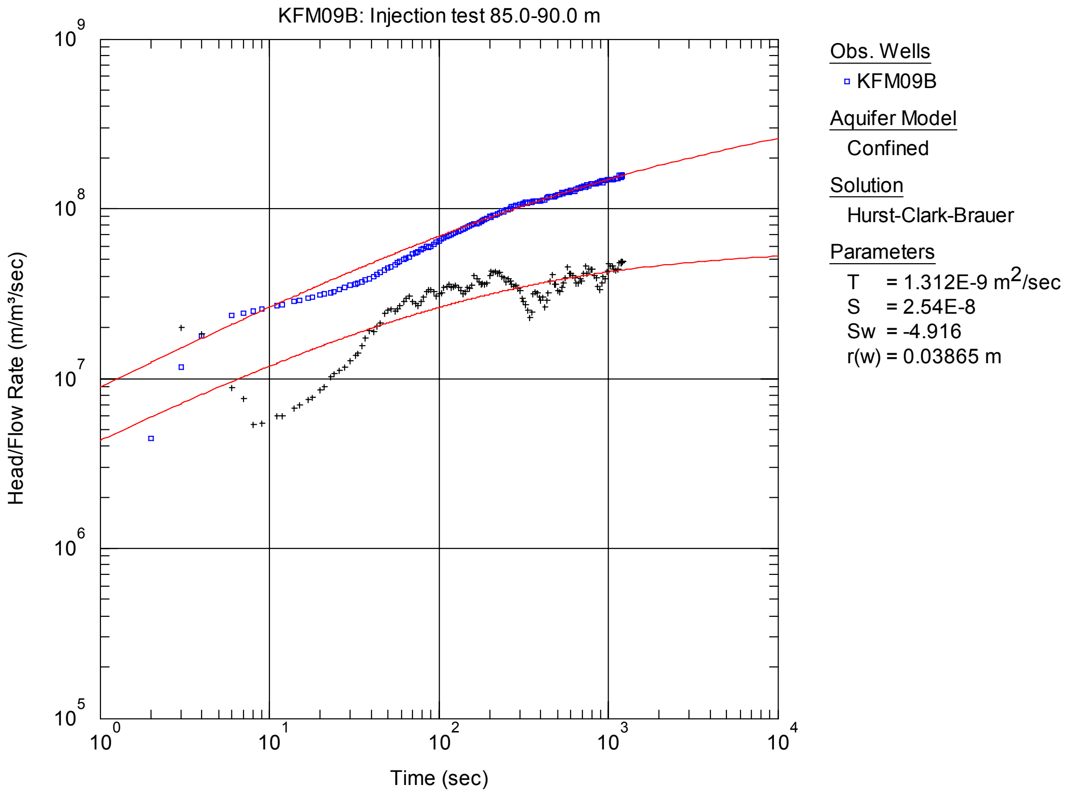


Figure A3-239. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 85.0-90.0 m in KFM09B.*

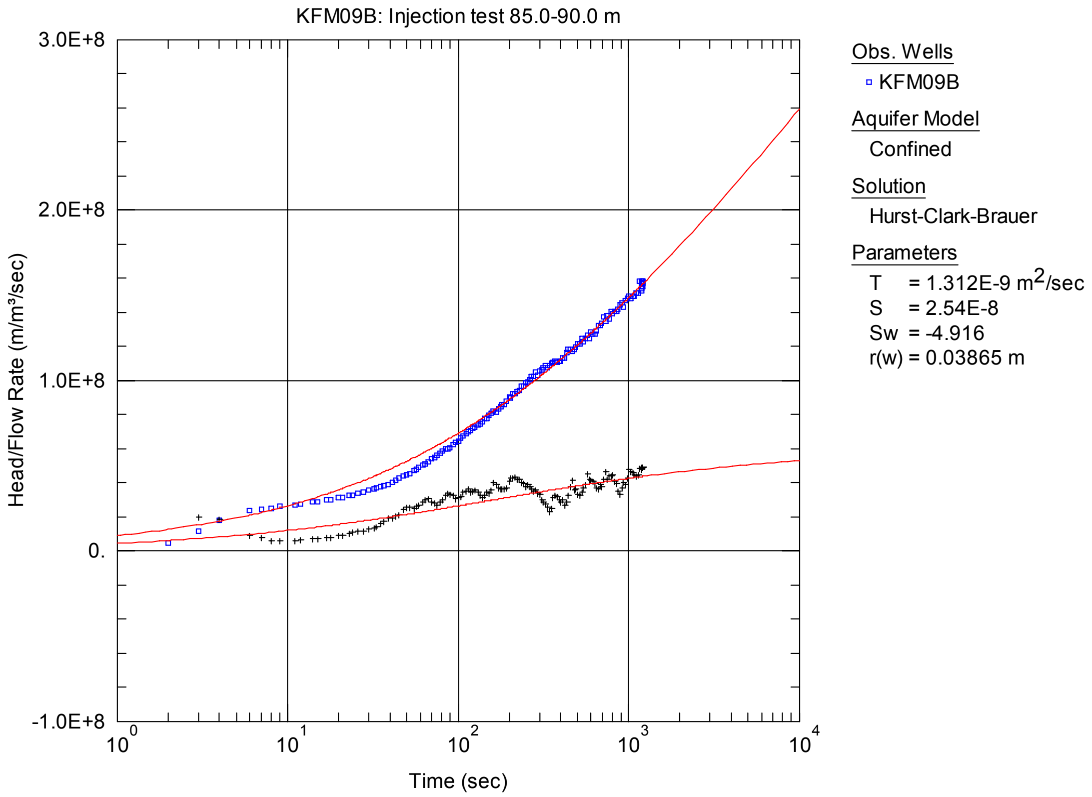


Figure A3-240. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 85.0-90.0 m in KFM09B.*

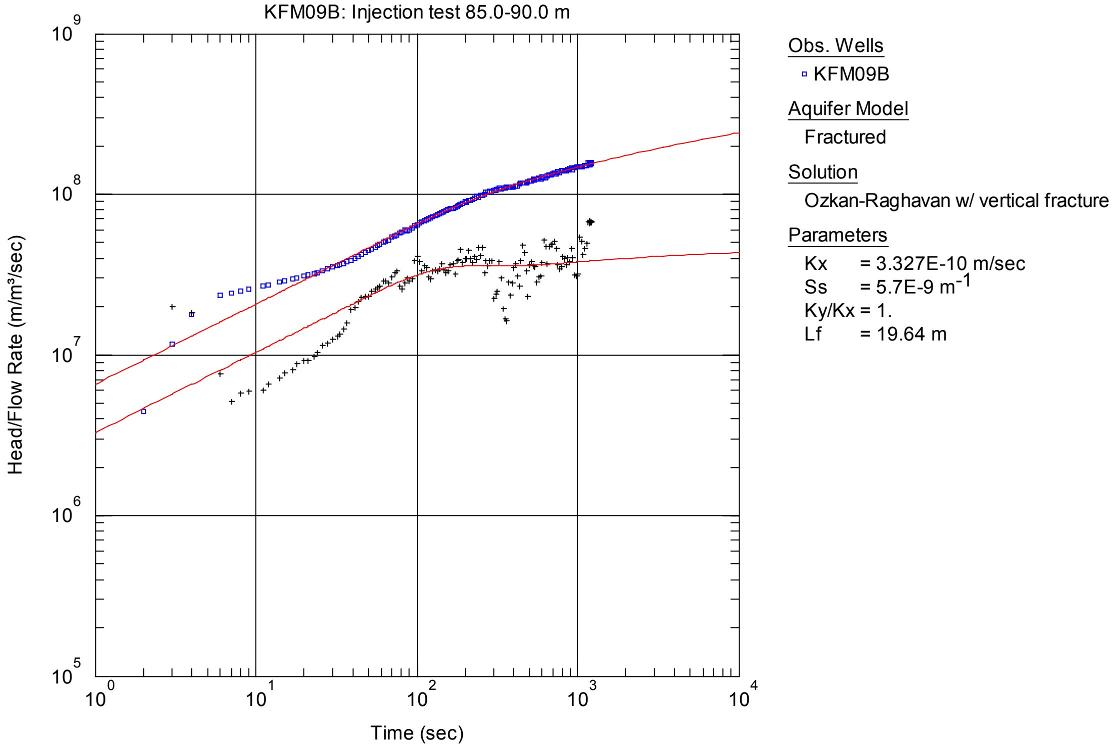


Figure A3-241. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 85.0-90.0 m in KFM09B.*

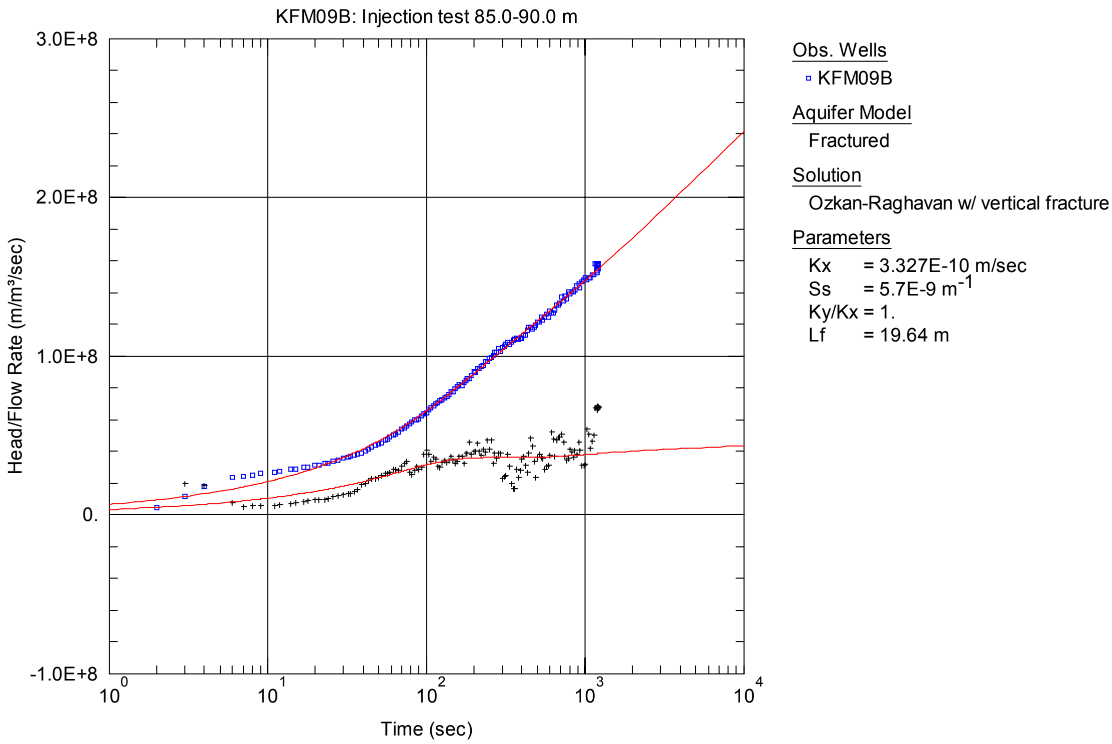


Figure A3-242. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 85.0-90.0 m in KFM09B.*

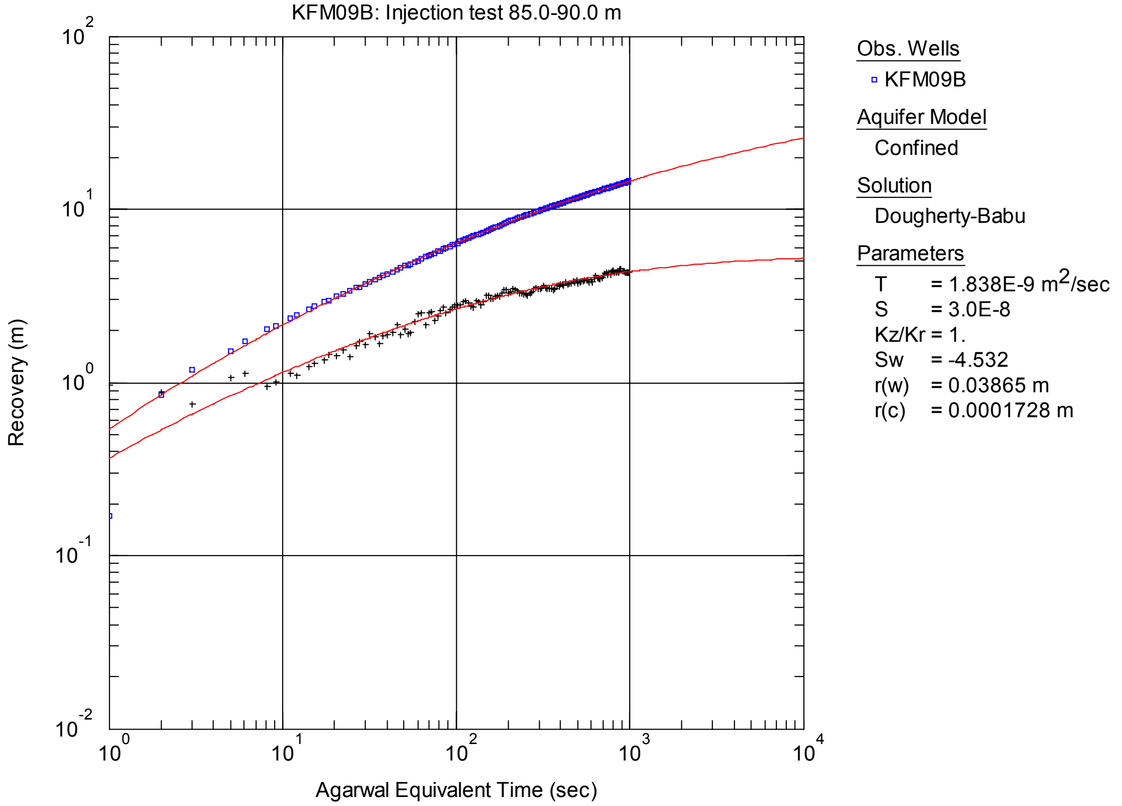


Figure A3-243. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 85.0-90.0 m in KFM09B.*

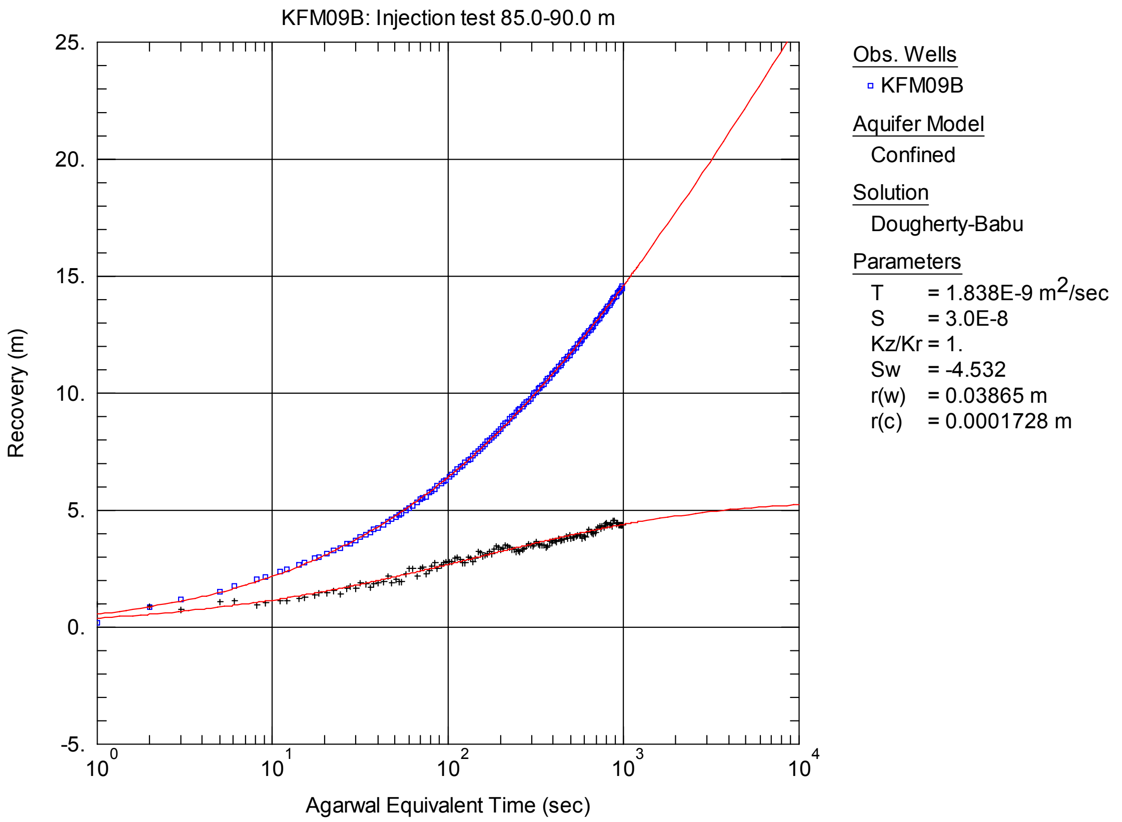


Figure A3-244. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 85.0-90.0 m in KFM09B.*

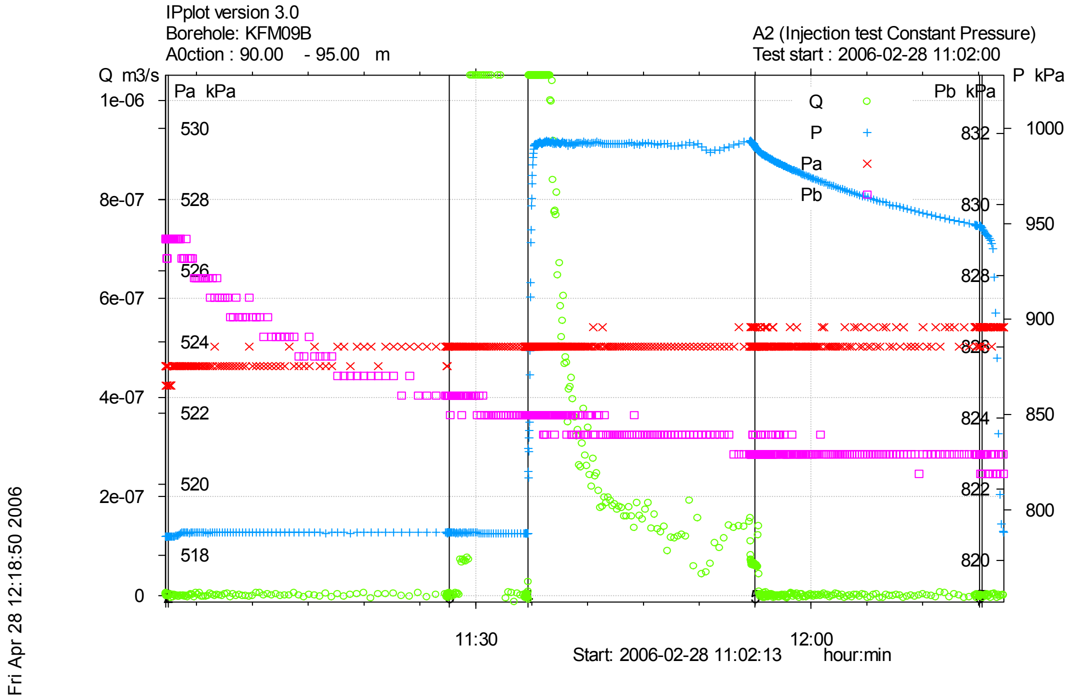


Figure A3-245. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 90.0-95.0 m in borehole KFM09B.*

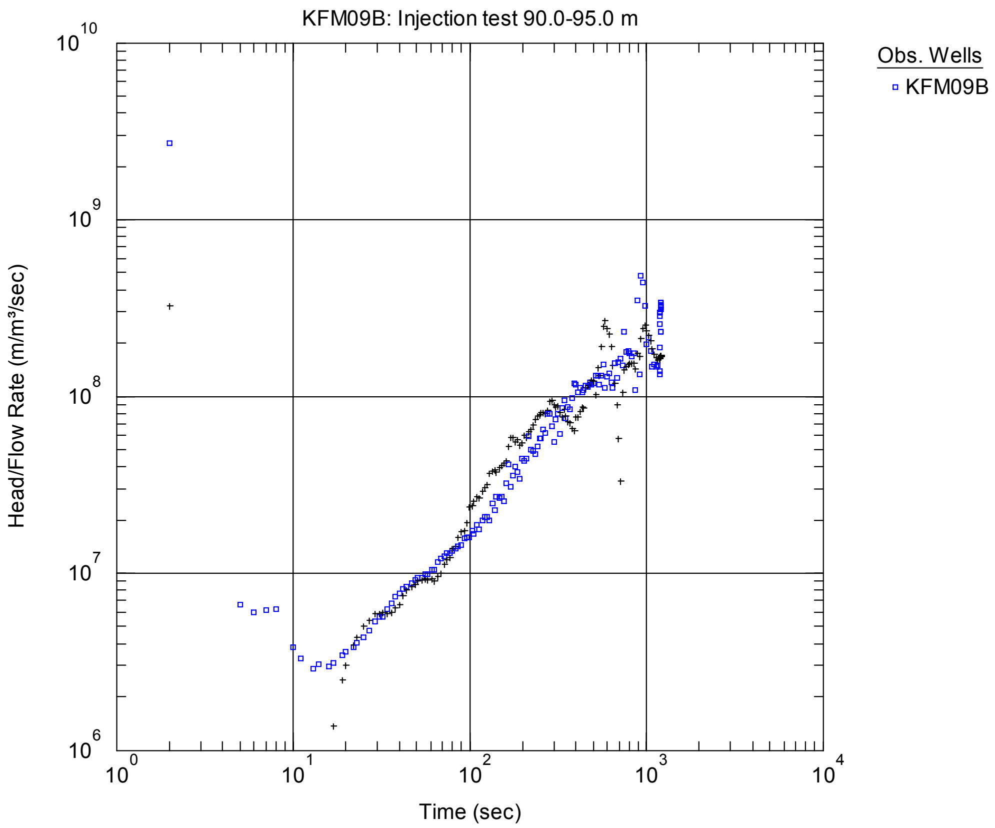


Figure A3-246. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 90.0-95.0 m in KFM09B.*

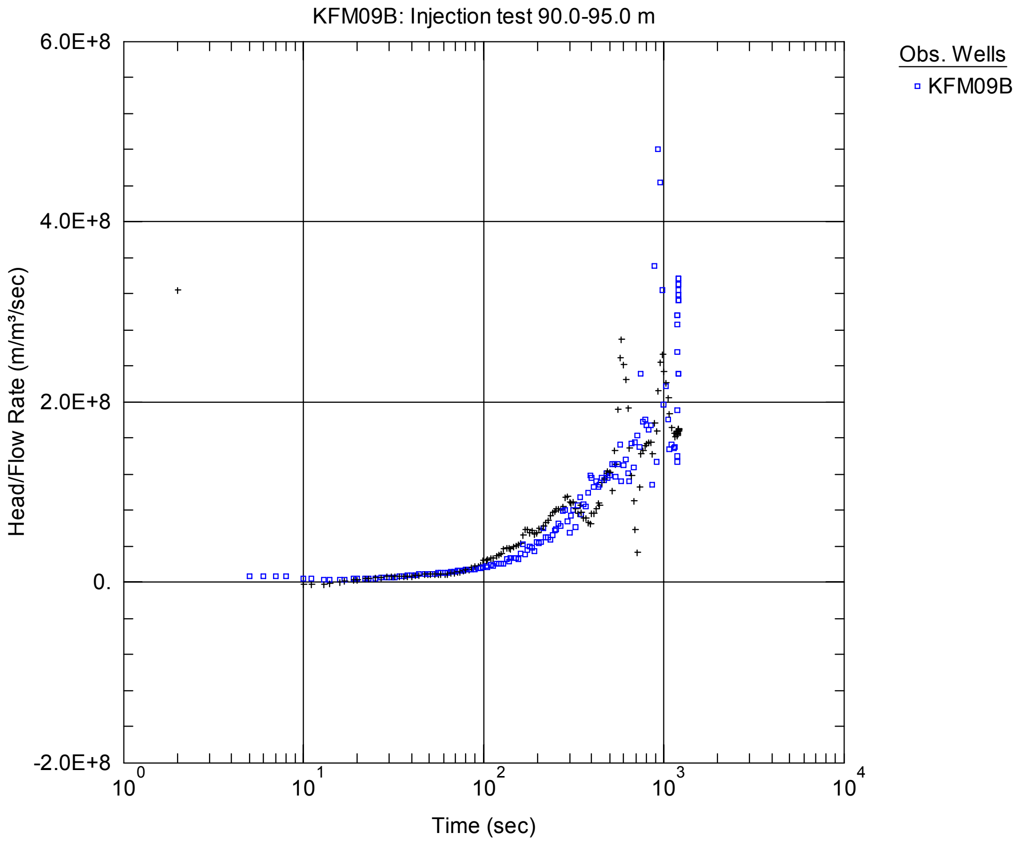


__Figure A3-247.__ Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 90.0-95.0 m in KFM09B.

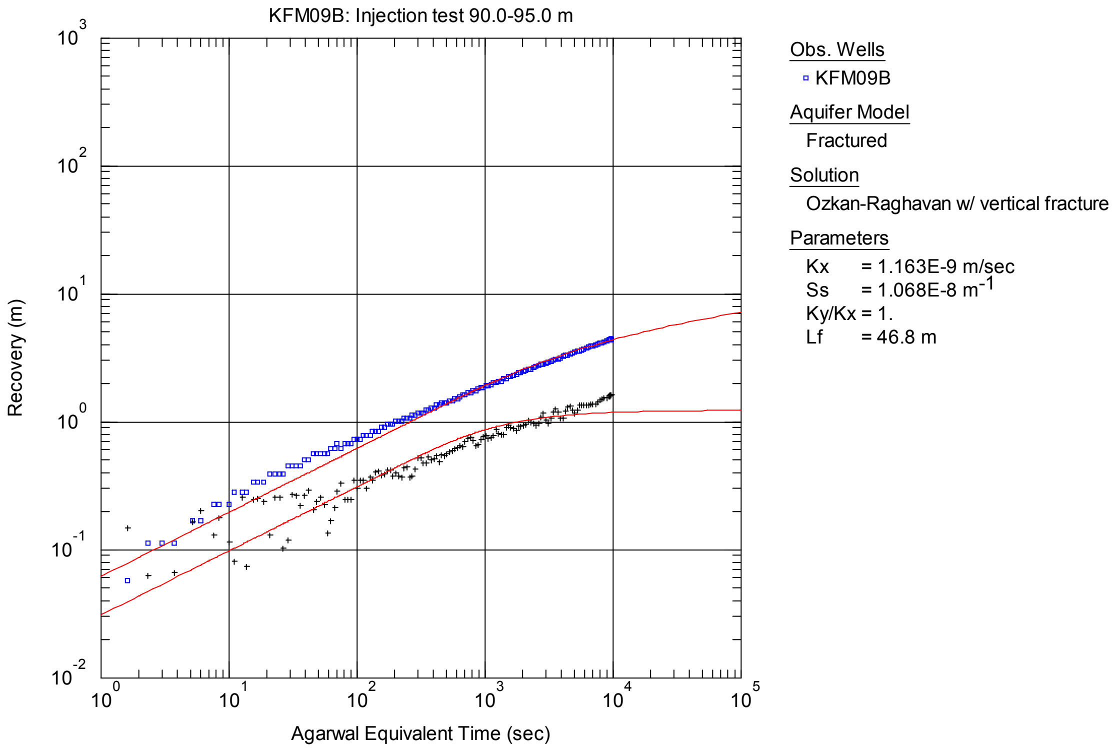


__Figure A3-248.__ Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 90.0-95.0 m in KFM09B.

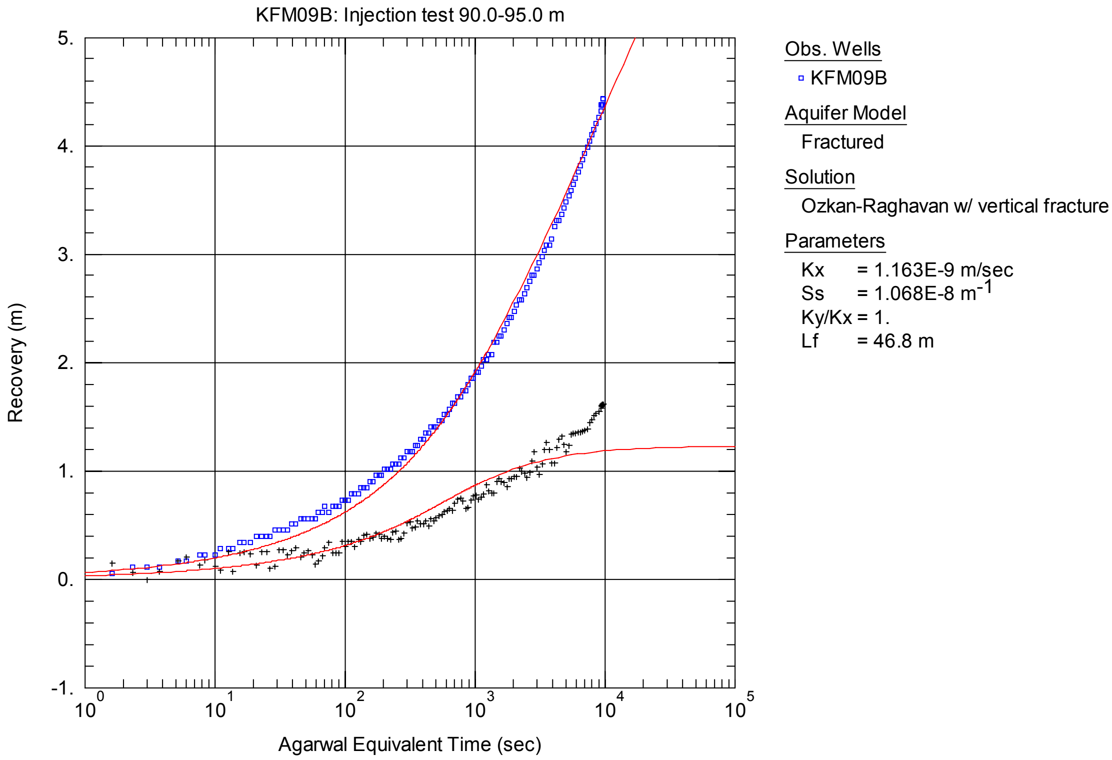


***Figure A3-249.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 90.0-95.0 m in KFM09B.*

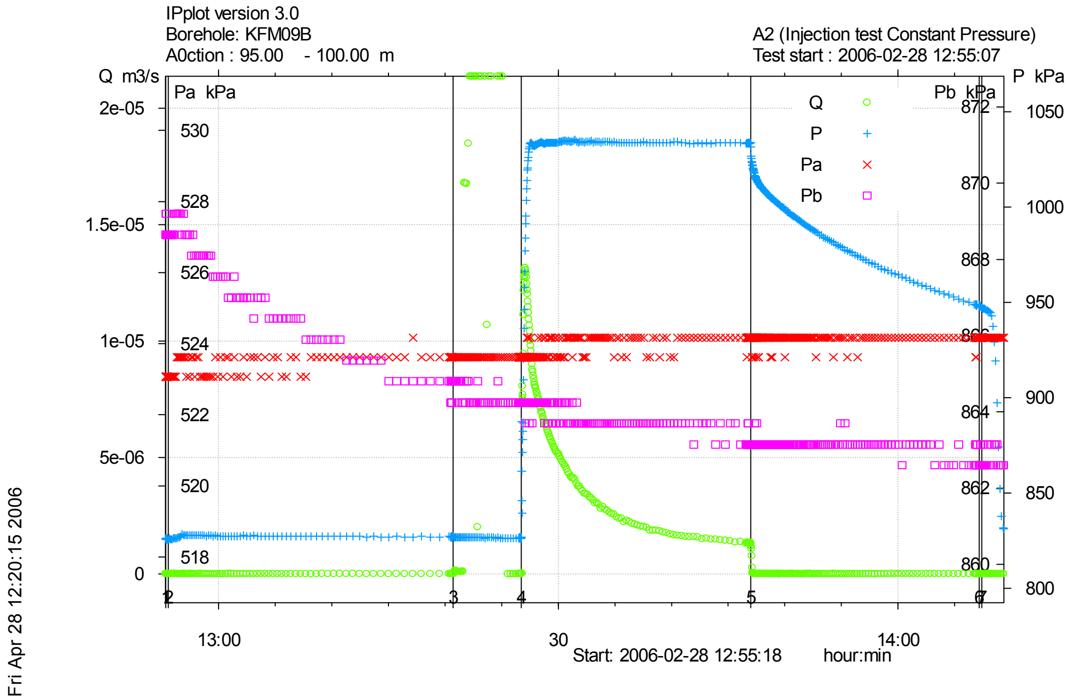


***Figure A3-250.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 95.0-100.0 m in borehole KFM09B.*

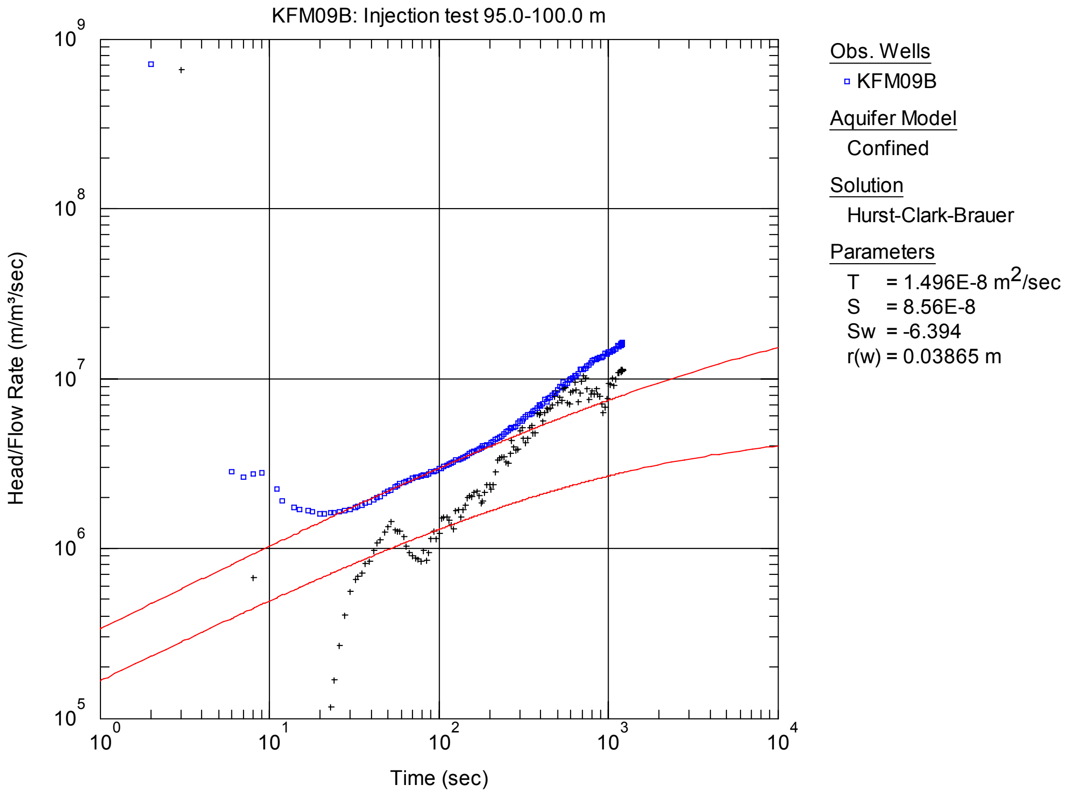


Figure A3-251. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 95.0-100.0 m in KFM09B.*

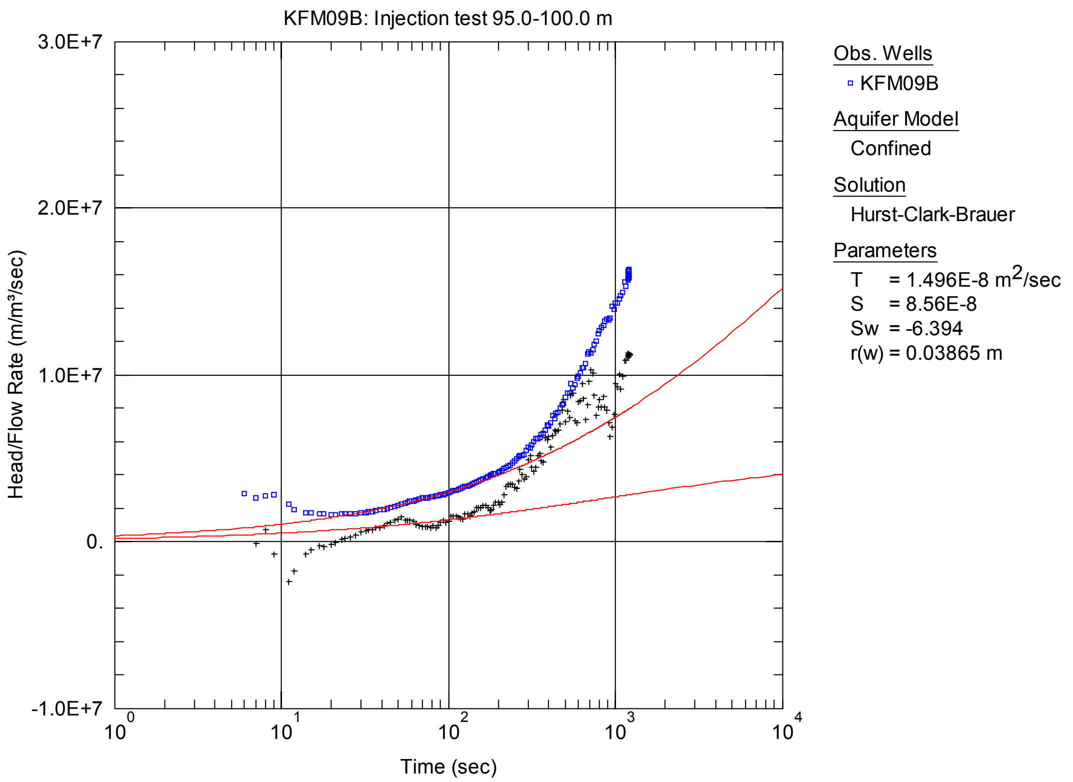


Figure A3-252. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 95.0-100.0 m in KFM09B.*

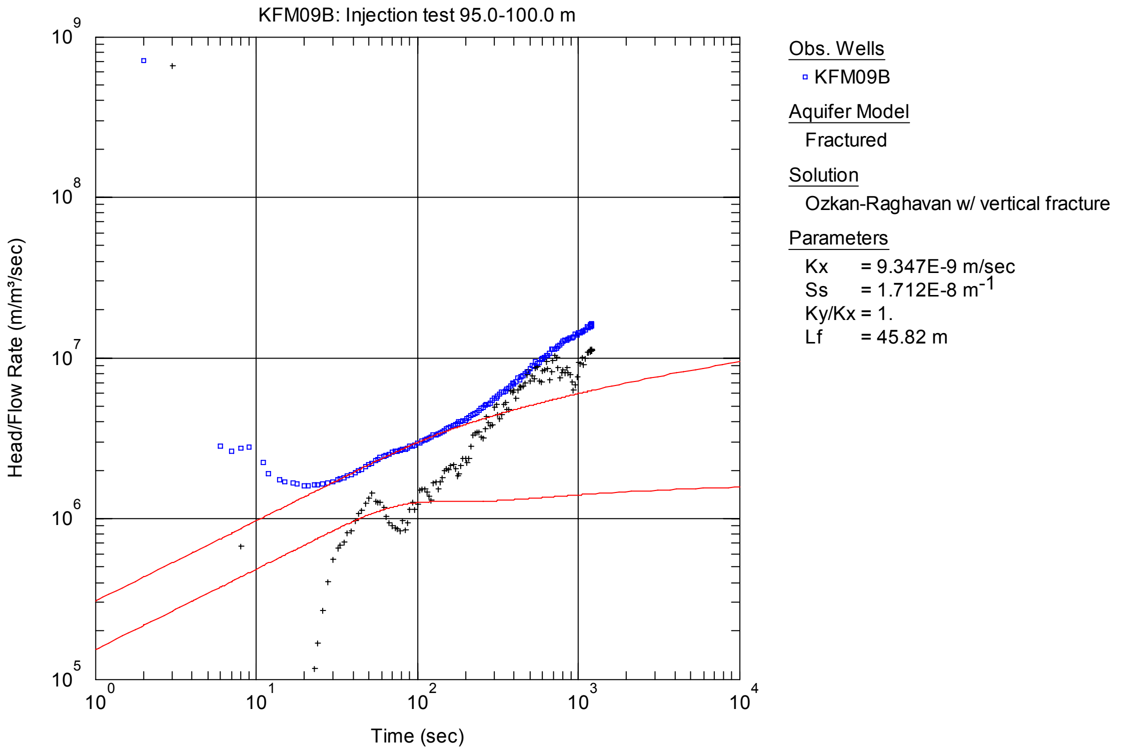


Figure A3-253. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 95.0-100.0 m in KFM09B.*

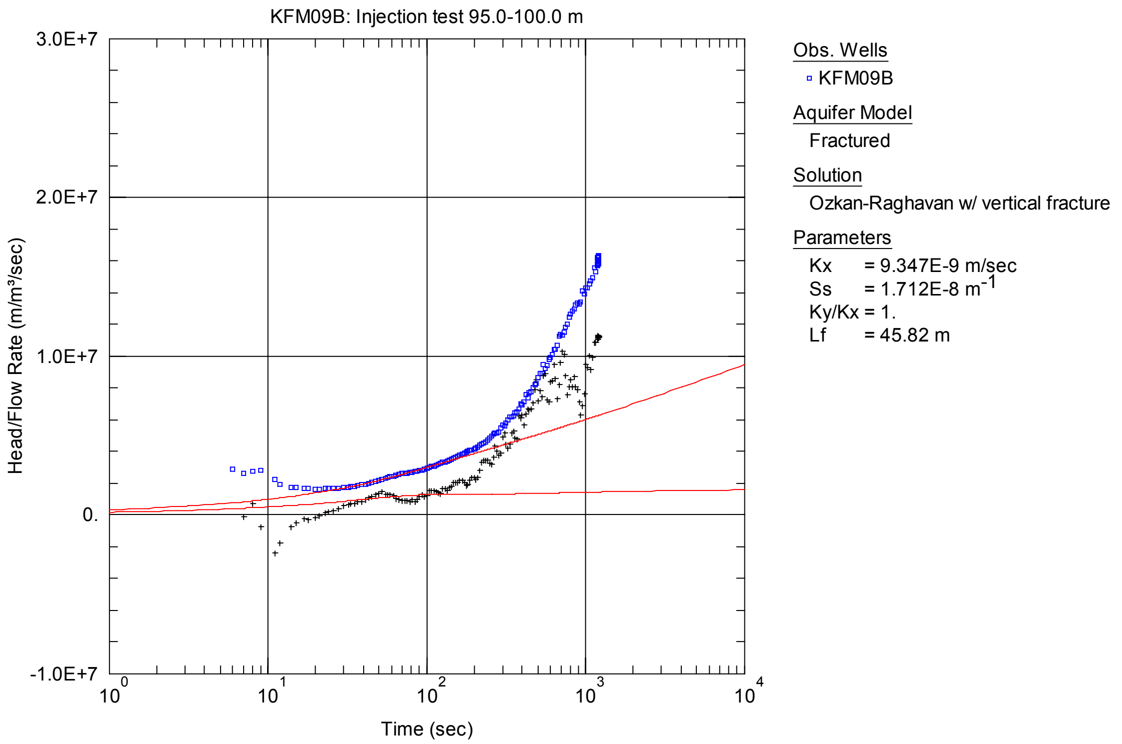


Figure A3-254. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 95.0-100.0 m in KFM09B.*

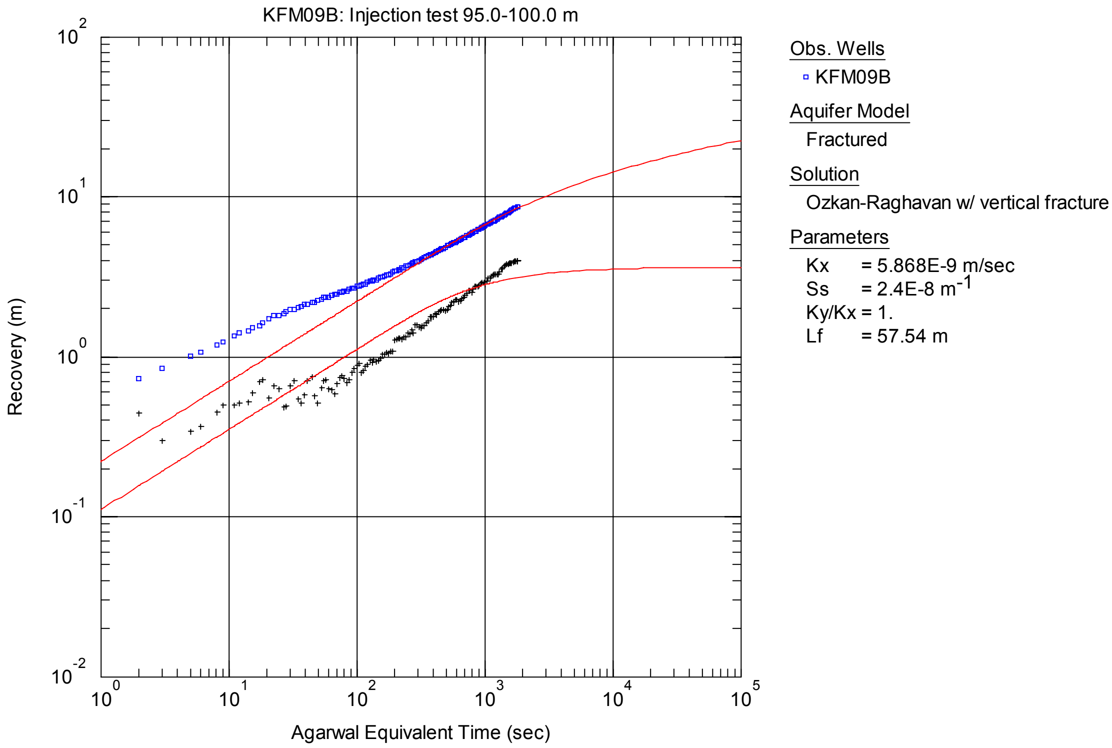


Figure A3-255. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 95.0-100.0 m in KFM09B.*

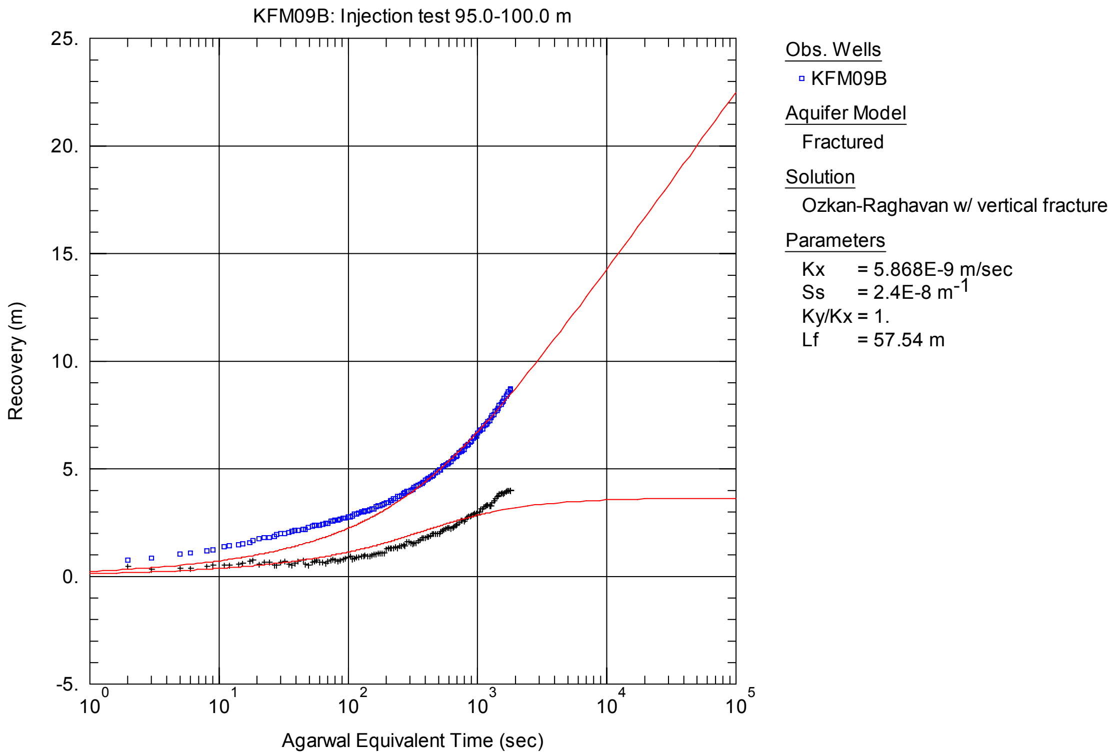


Figure A3-256. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 95.0-100.0 m in KFM09B.*

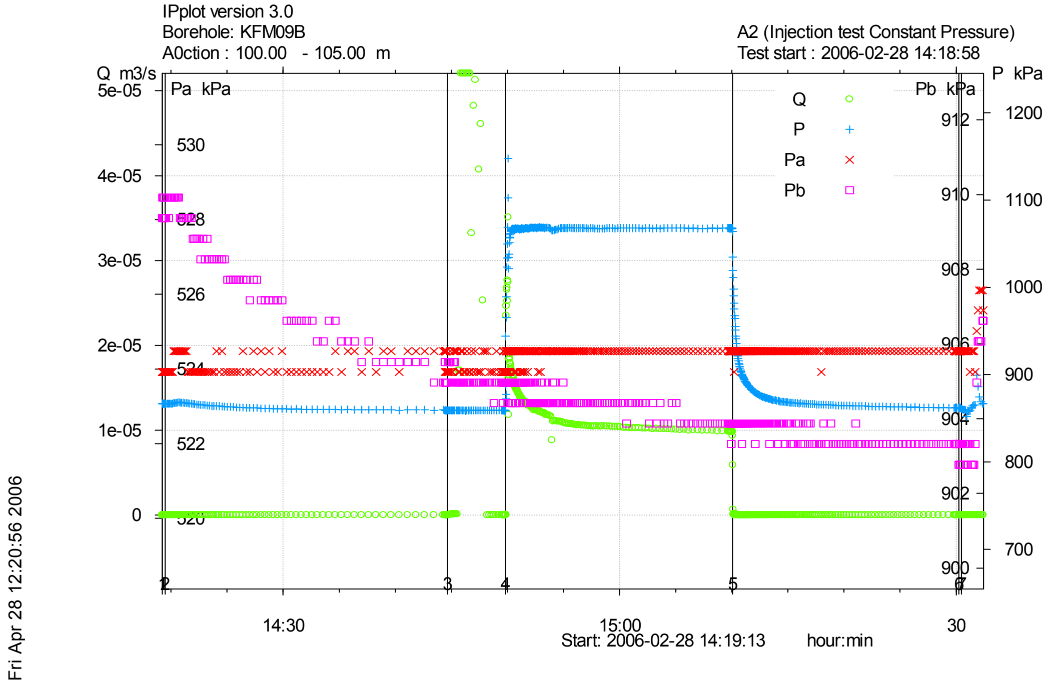


Figure A3-257. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 100.0-105.0 m in borehole KFM09B.

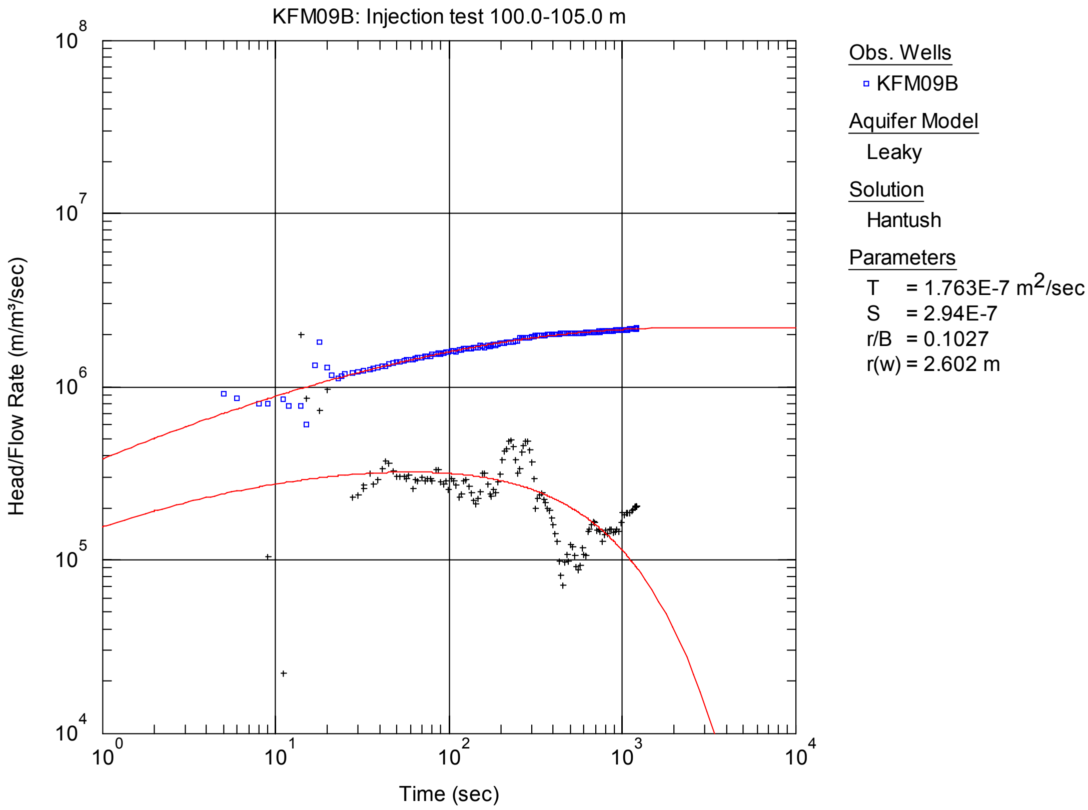


Figure A3-258. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 100.0-105.0 m in KFM09B.

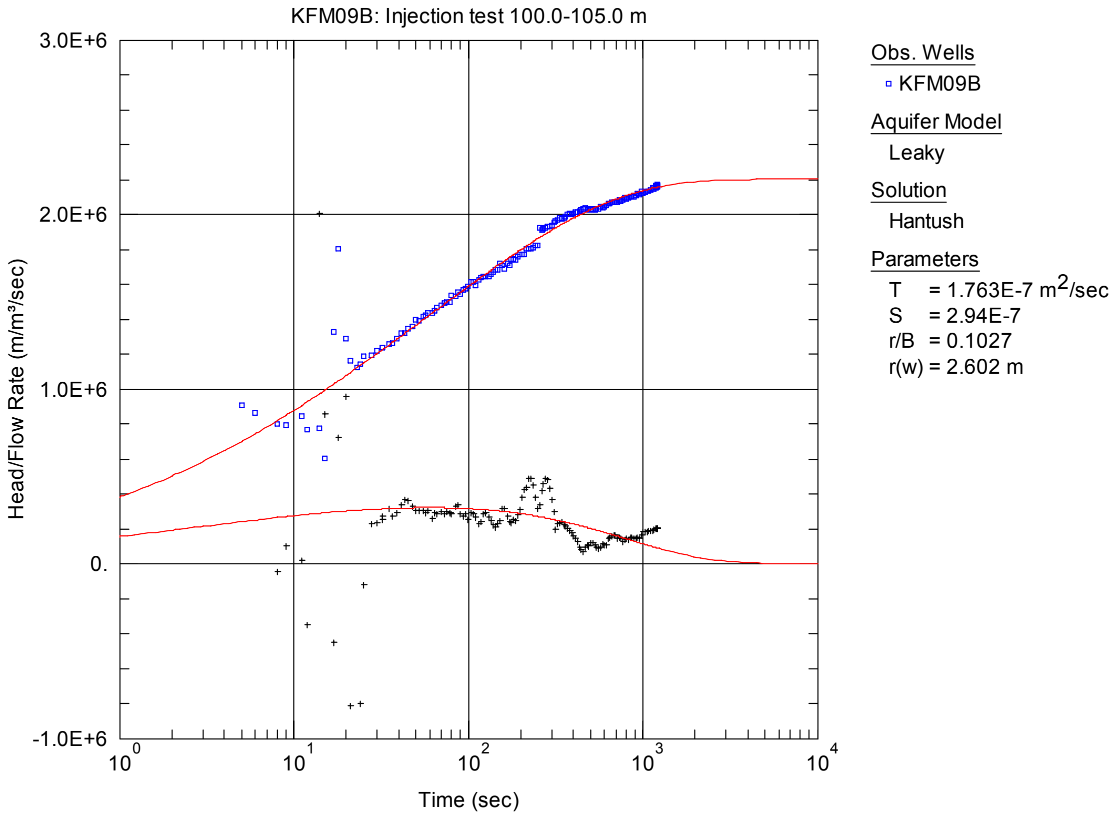


Figure A3-259. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 100.0-105.0 m in KFM09B.*

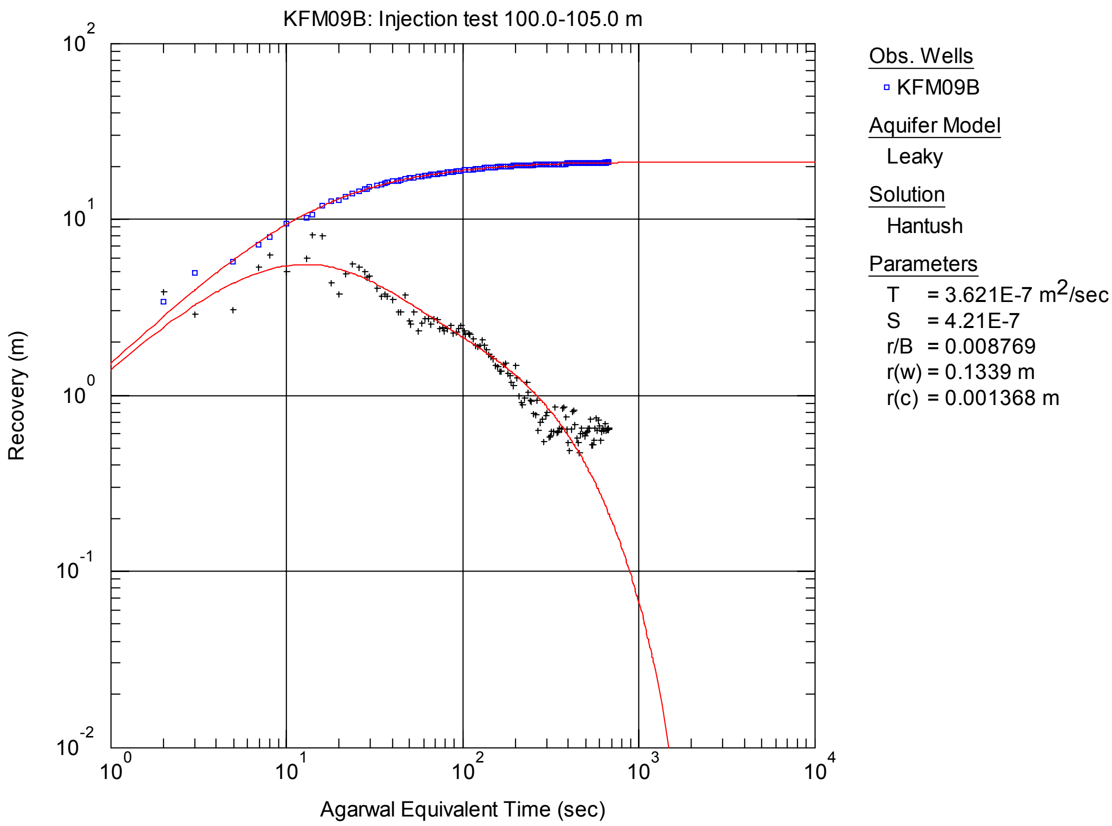


Figure A3-260. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 100.0-105.0 m in KFM09B.*

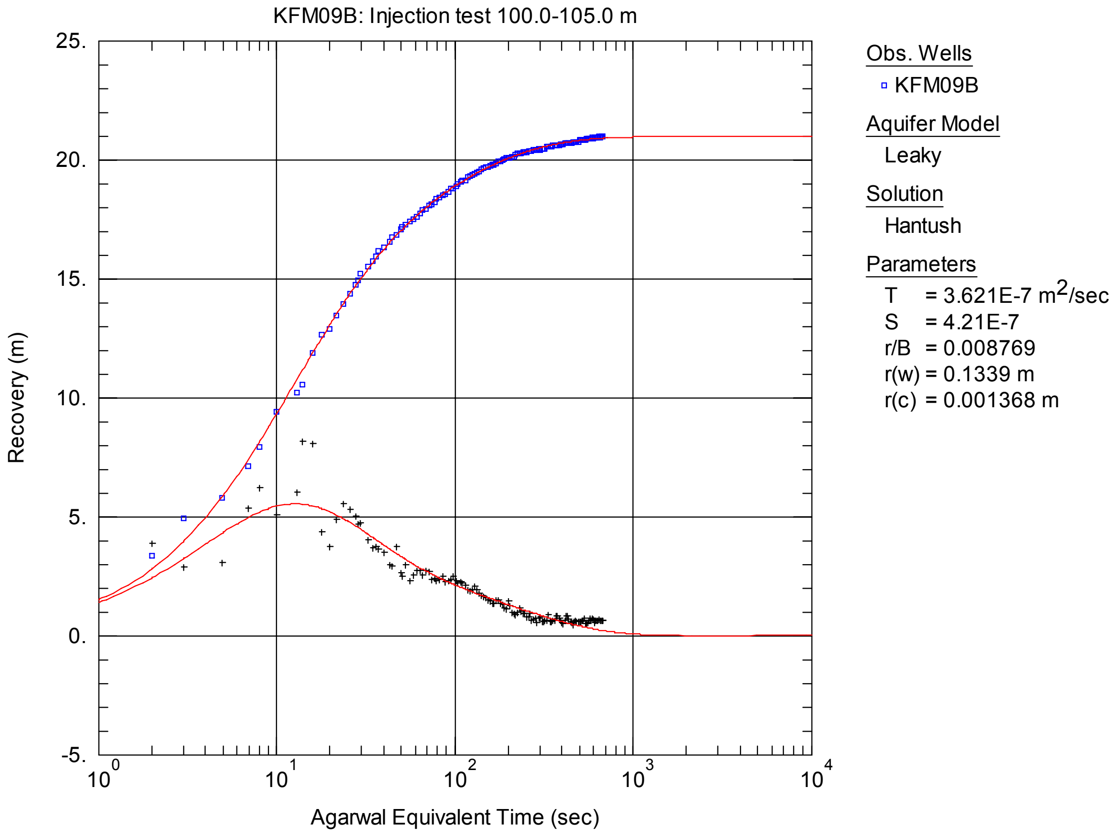


Figure A3-261. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 100.0-105.0 m in KFM09B.*

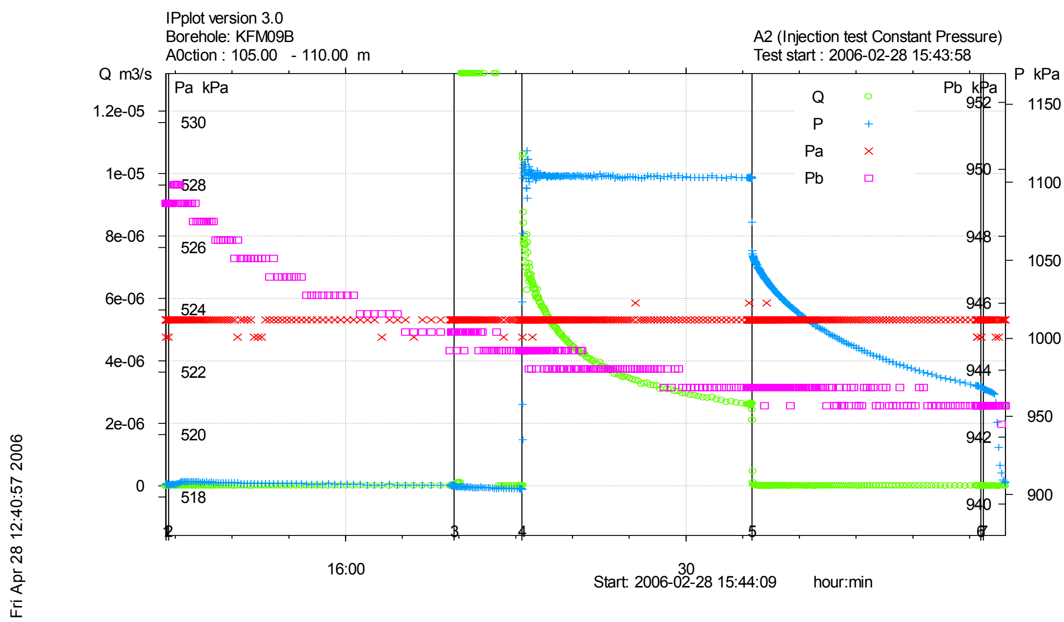


Figure A3-262. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 105.0-110.0 m in borehole KFM09B.*

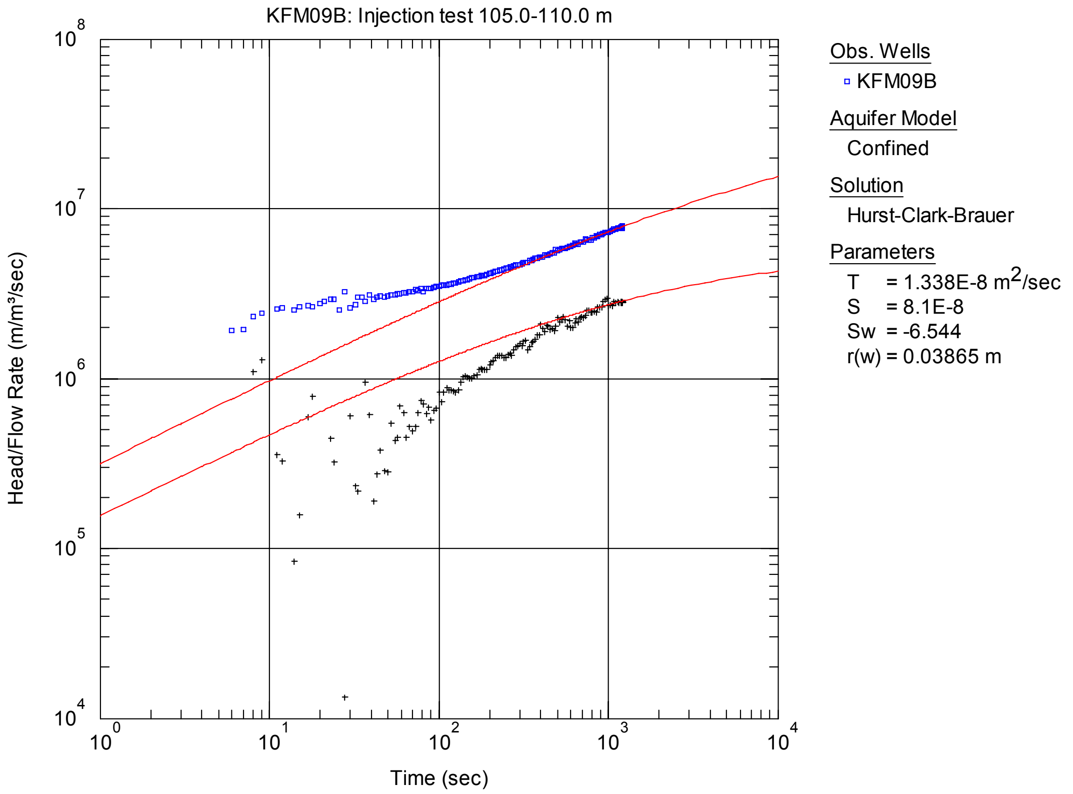


Figure A3-263. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 105.0-110.0 m in KFM09B.*

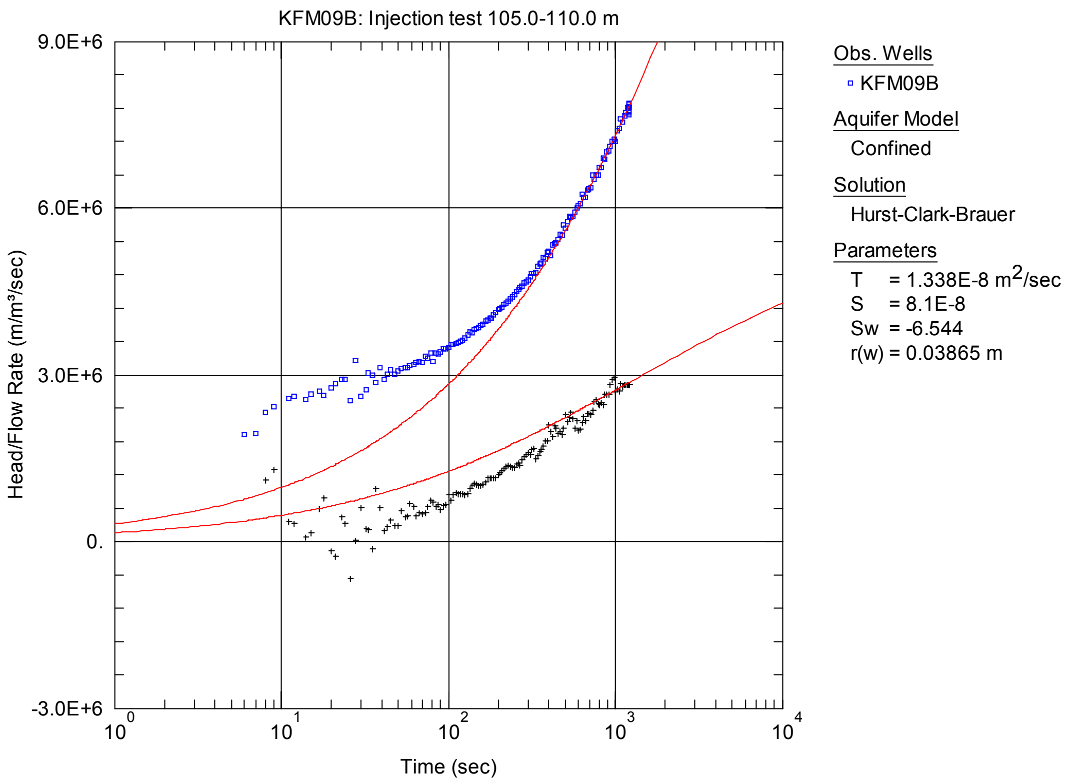


Figure A3-264. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 105.0-110.0 m in KFM09B.*

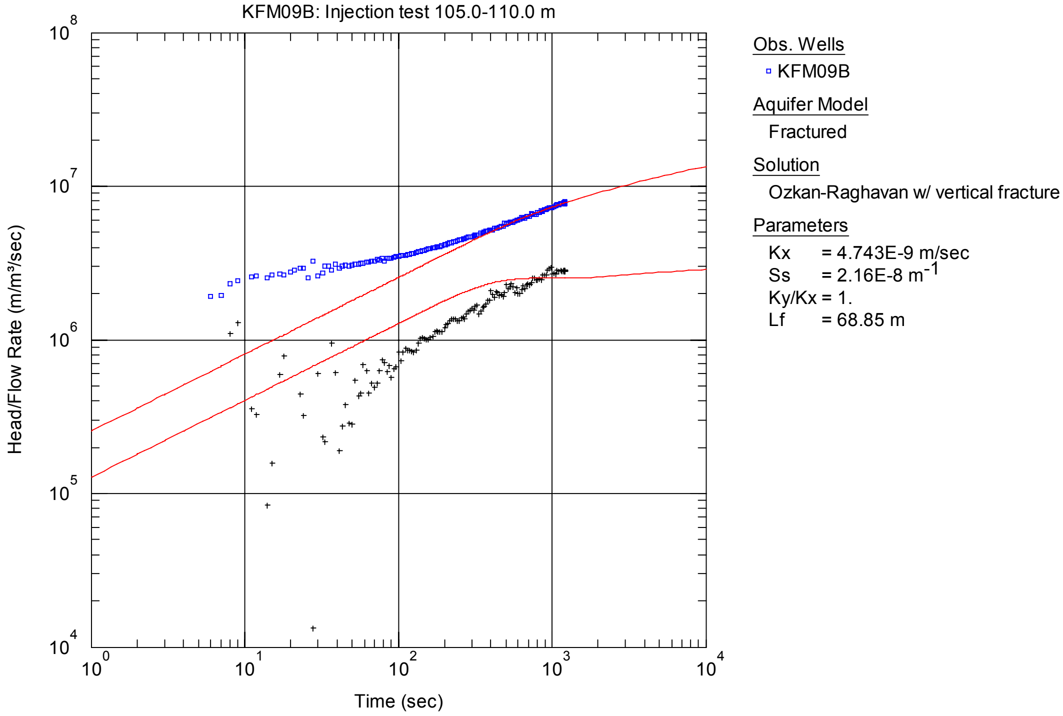


***Figure A3-265.** Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 105.0-110.0 m in KFM09B.*

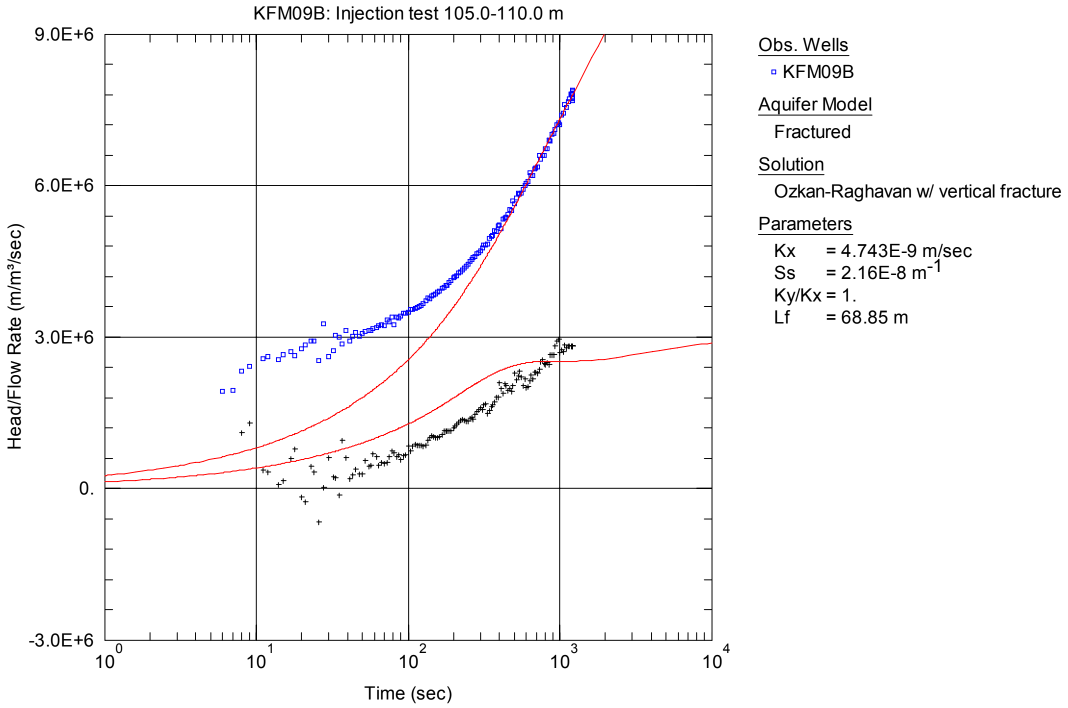


***Figure A3-266.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 105.0-110.0 m in KFM09B.*

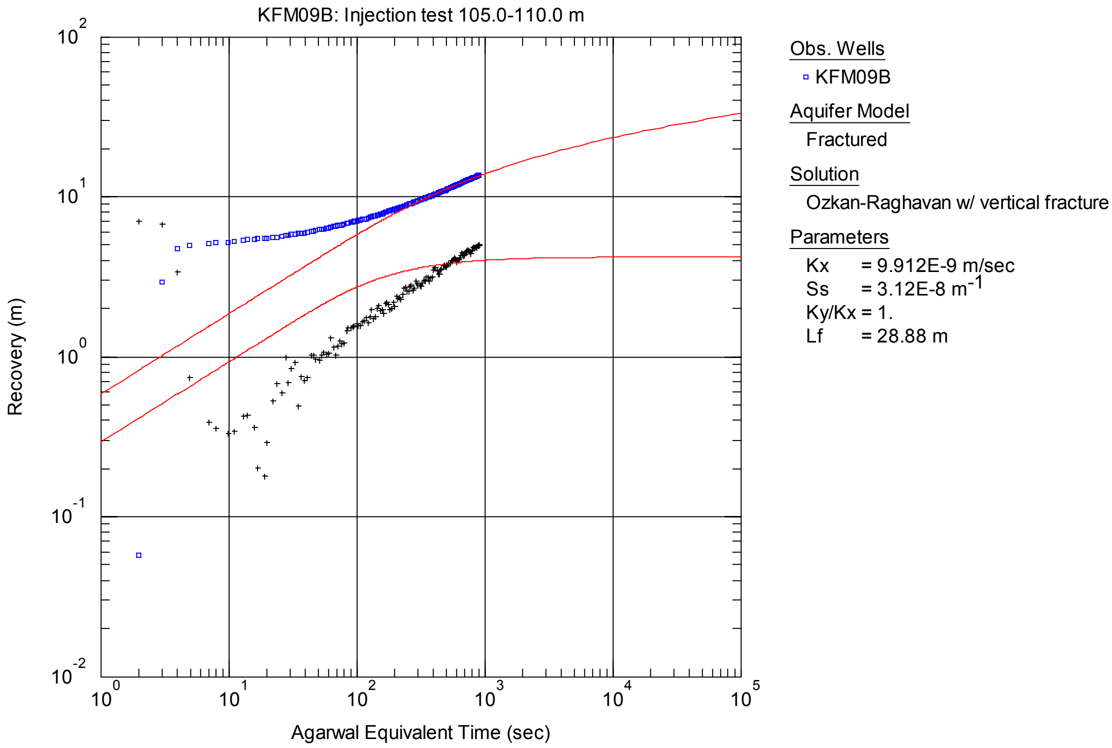


Figure A3-267. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 105.0-110.0 m in KFM09B.*

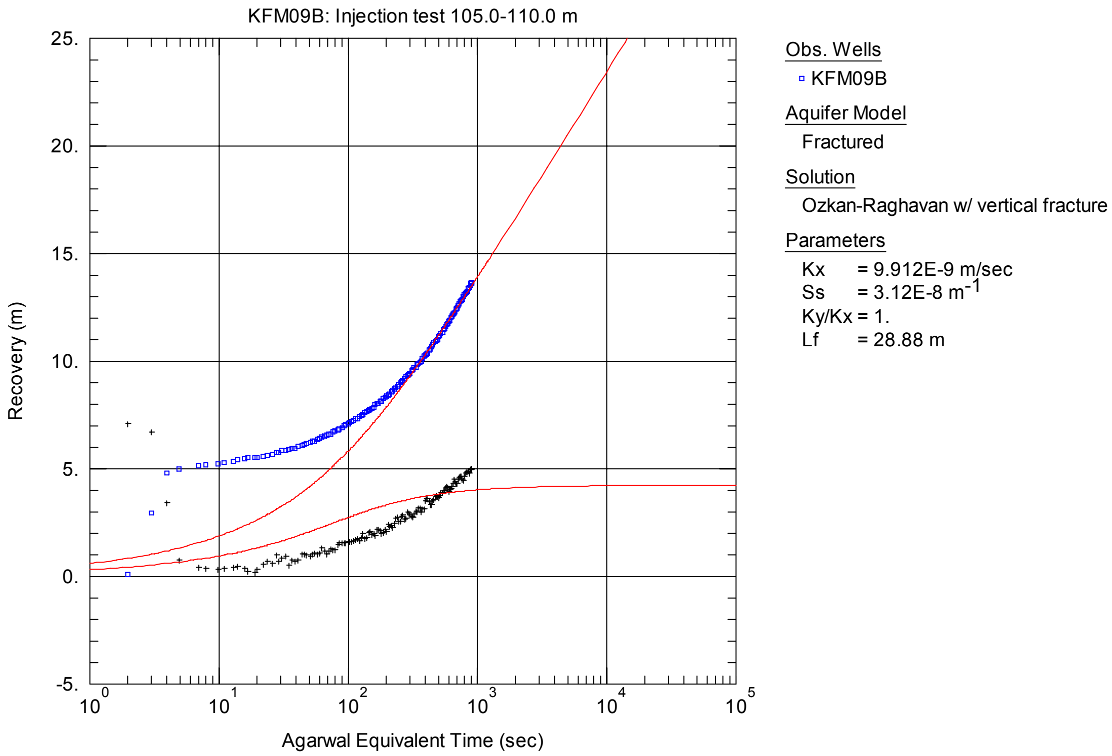


Figure A3-268. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 105.0-110.0 m in KFM09B.*

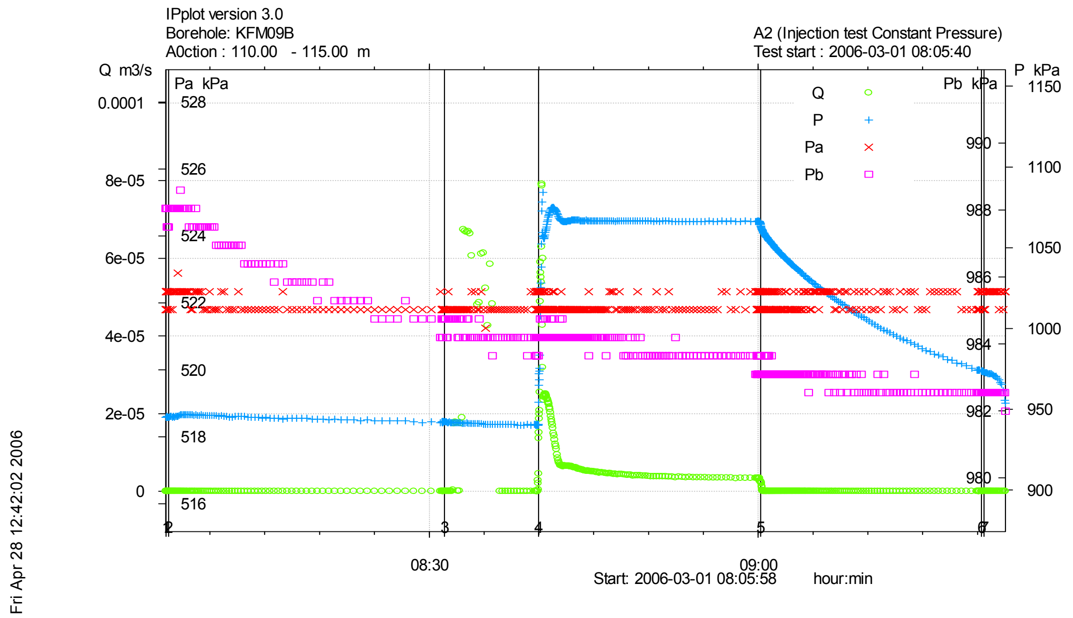


Figure A3-269. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 110.0-115.0 m in borehole KFM09B.*

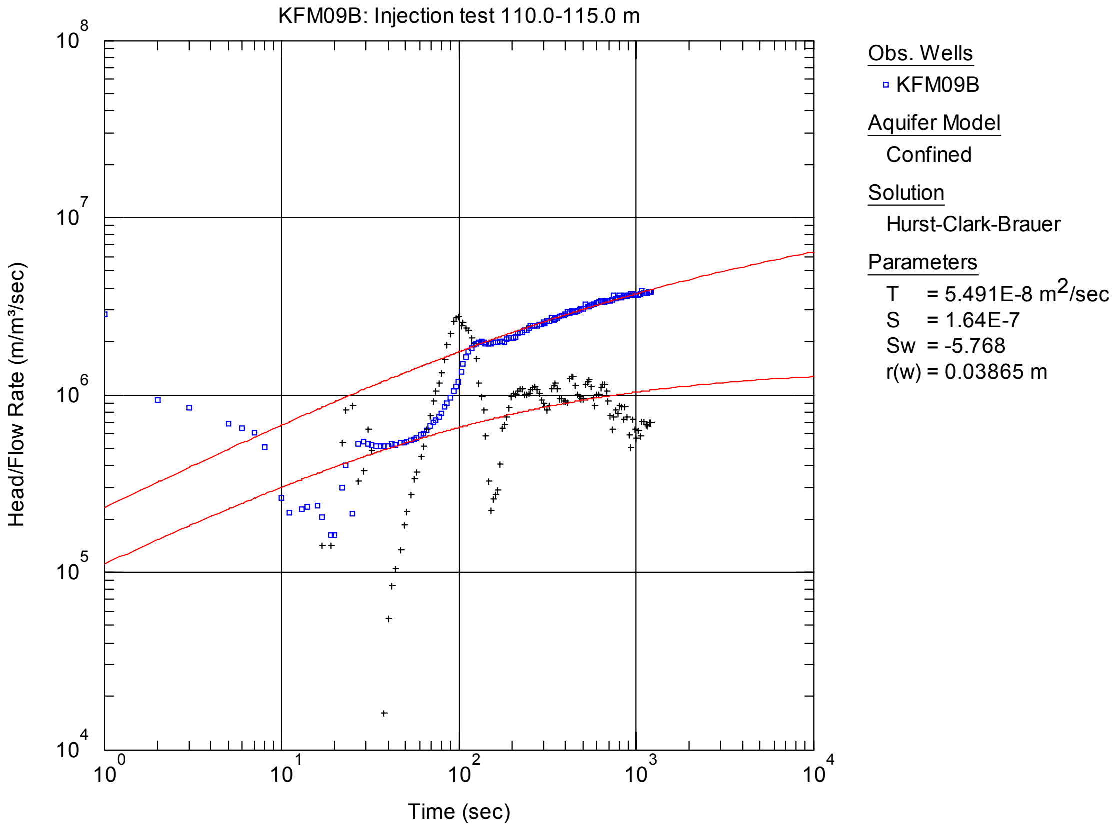


Figure A3-270. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 110.0-115.0 m in KFM09B.*

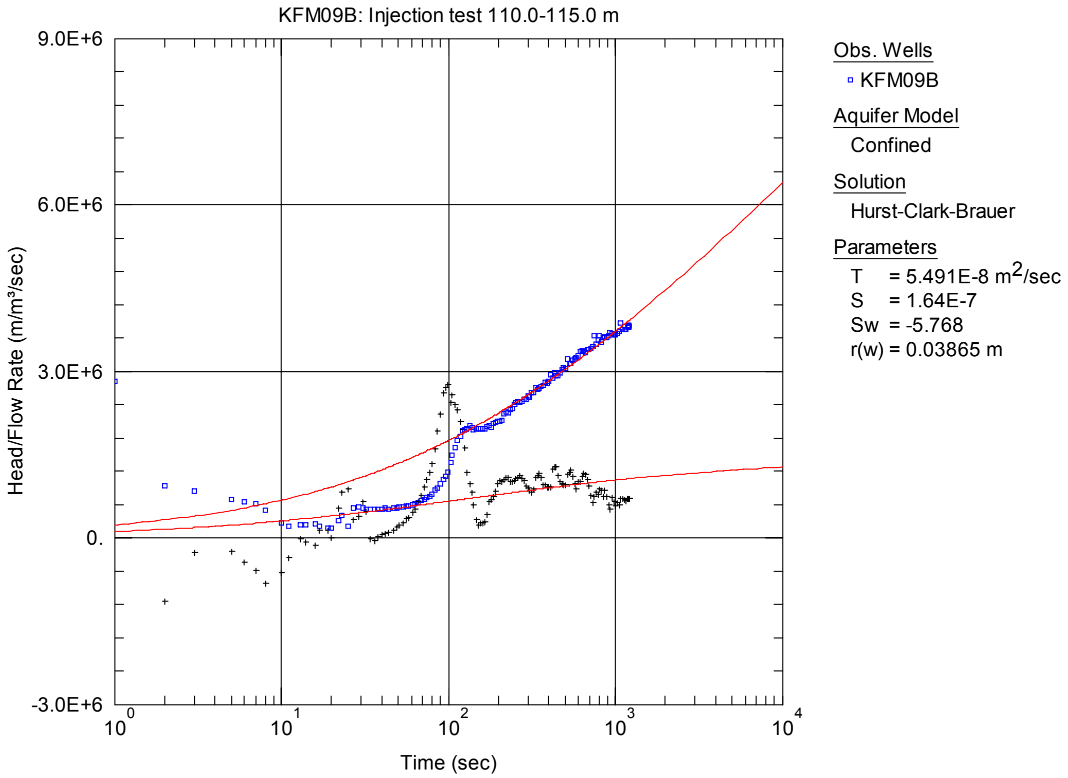


Figure A3-271. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 110.0-115.0 m in KFM09B.*

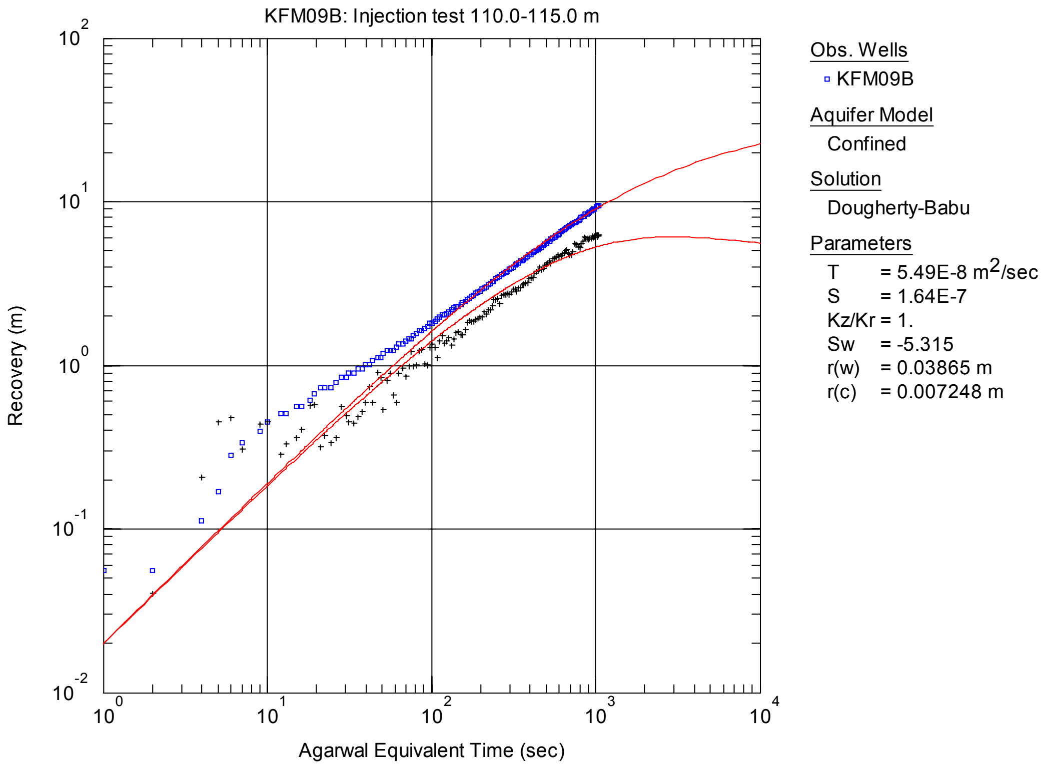


Figure A3-272. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 110.0-115.0 m in KFM09B. No unambiguous transient evaluation was possible for the recovery period. This diagram demonstrates a solution assuming the same values of transmissivity and storativity as were estimated from the injection period.*

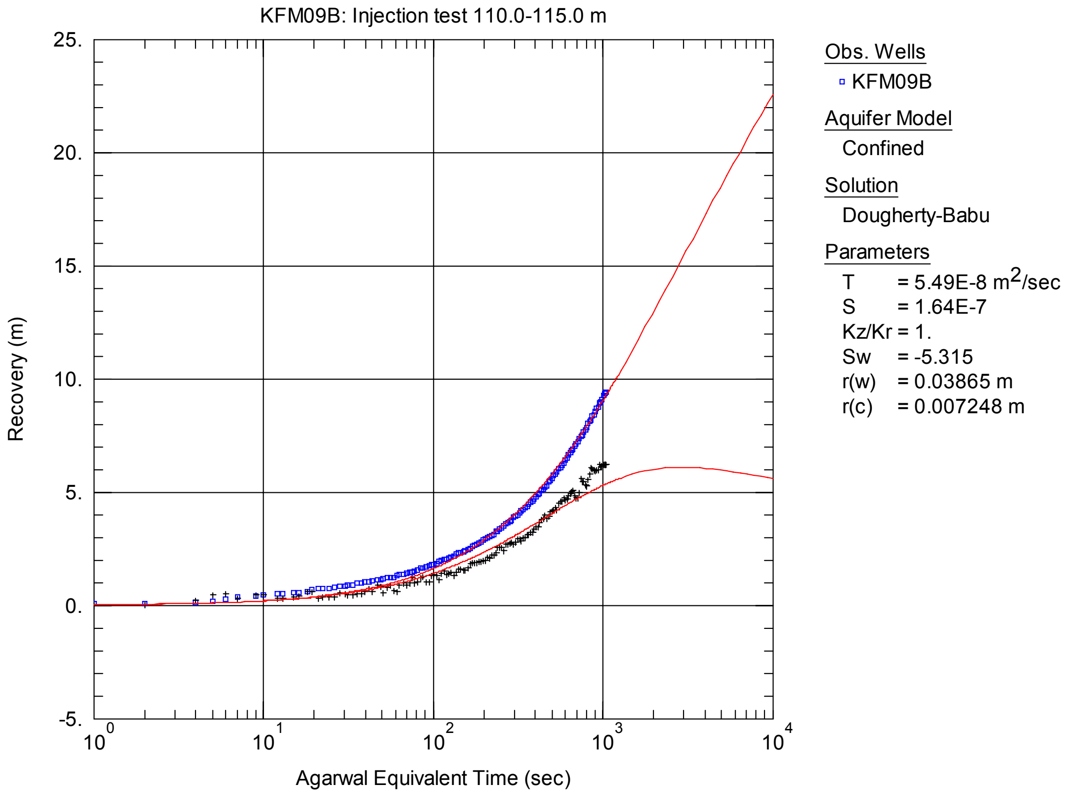


Figure A3-273. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 110.0-115.0 m in KFM09B. No unambiguous transient evaluation was possible for the recovery period. This diagram demonstrates a solution assuming the same values of transmissivity and storativity as were estimated from the injection period.*

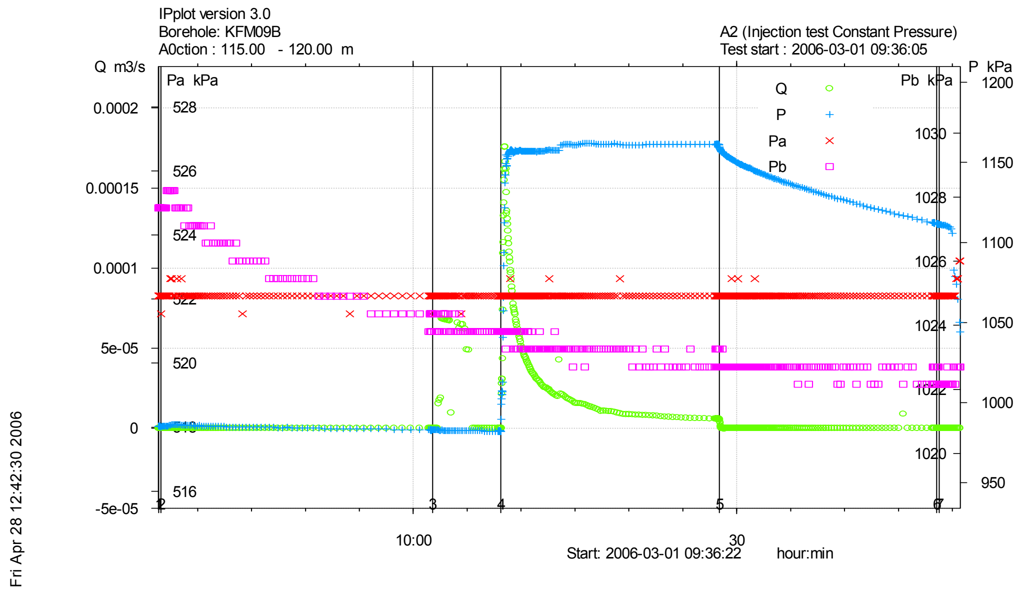


Figure A3-274. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 115.0-120.0 m in borehole KFM09B.*

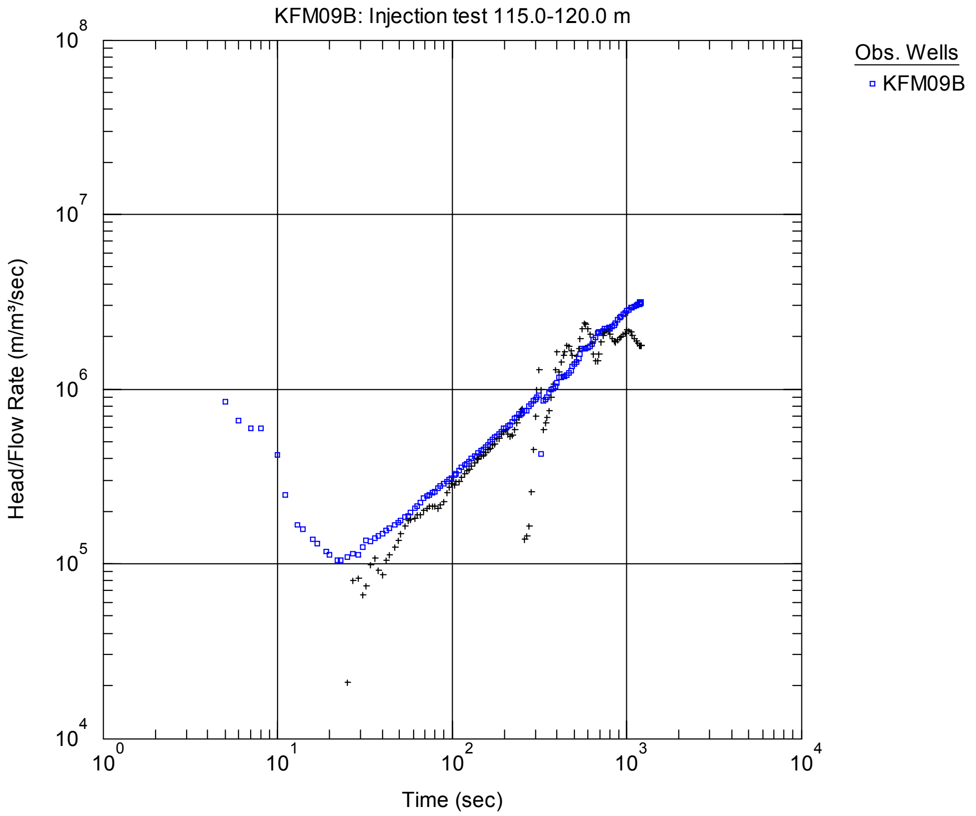


Figure A3-275. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 115.0-120.0 m in KFM09B.*

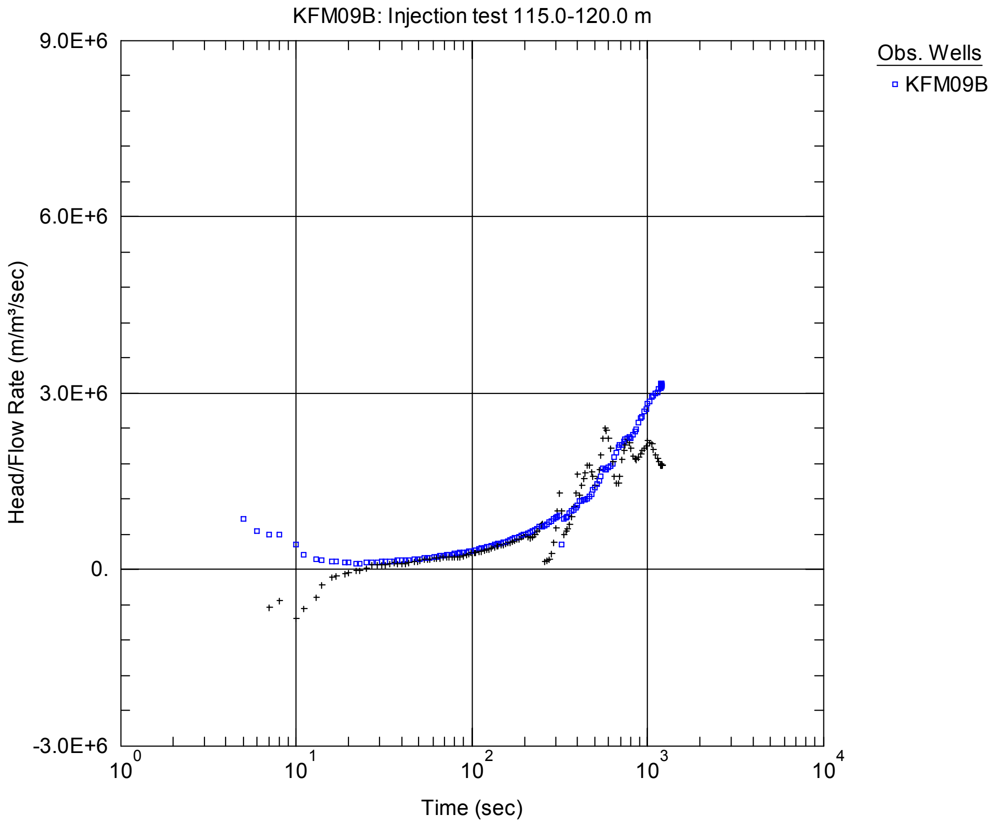


Figure A3-276. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 115.0-120.0 m in KFM09B.*

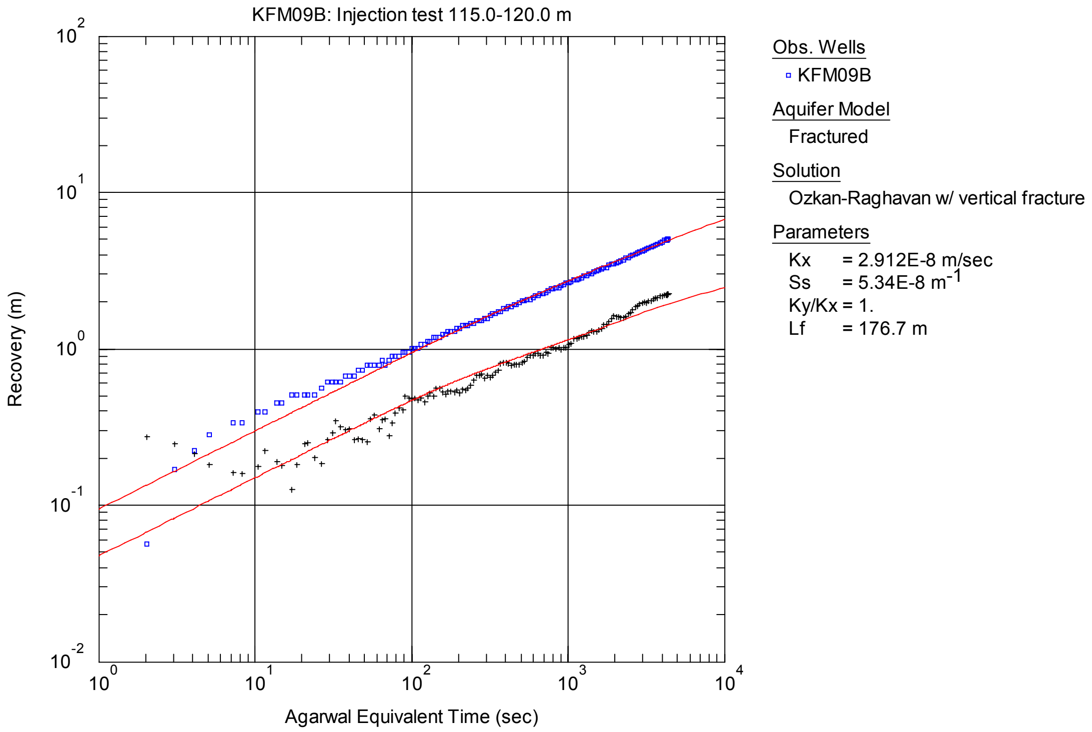


Figure A3-277. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 115.0-120.0 m in KFM09B.*

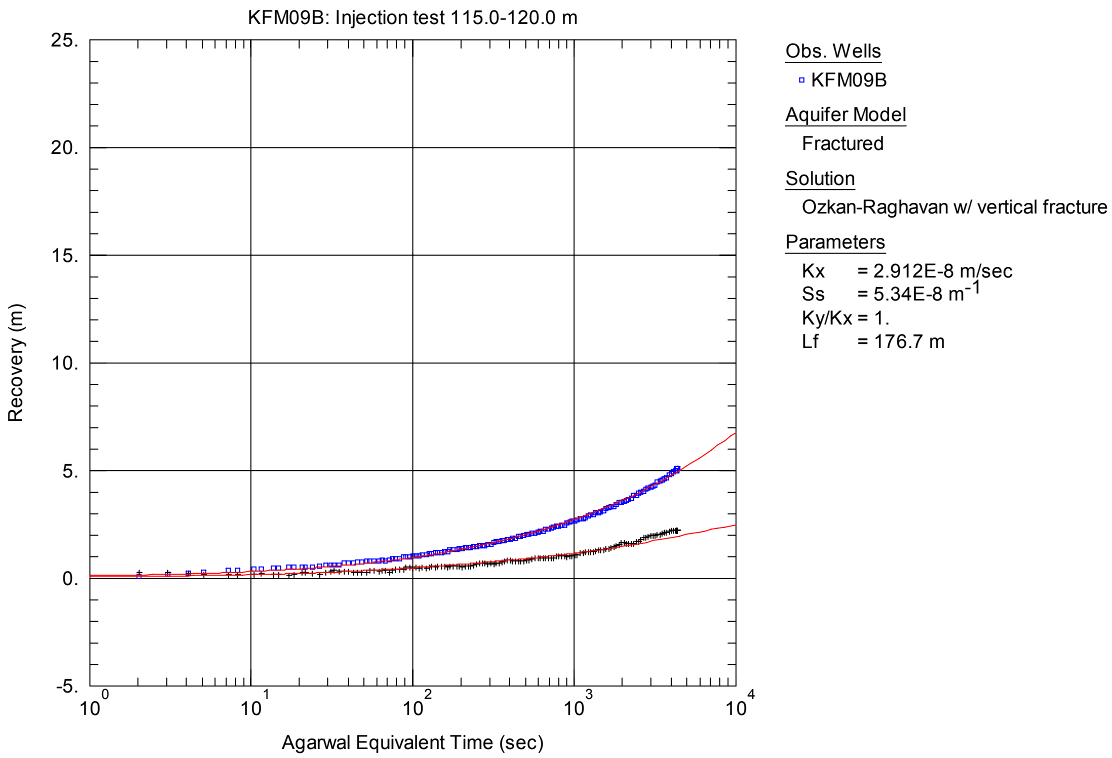


Figure A3-278. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 115.0-120.0 m in KFM09B.*

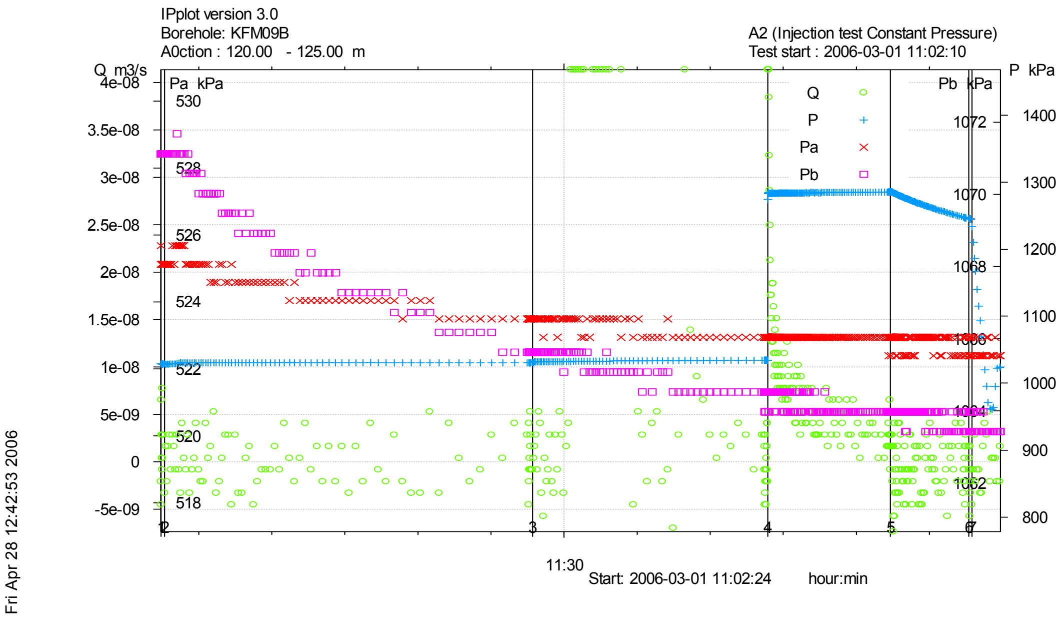


Figure A3-279. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 120.0-125.0 m in borehole KFM09B.*

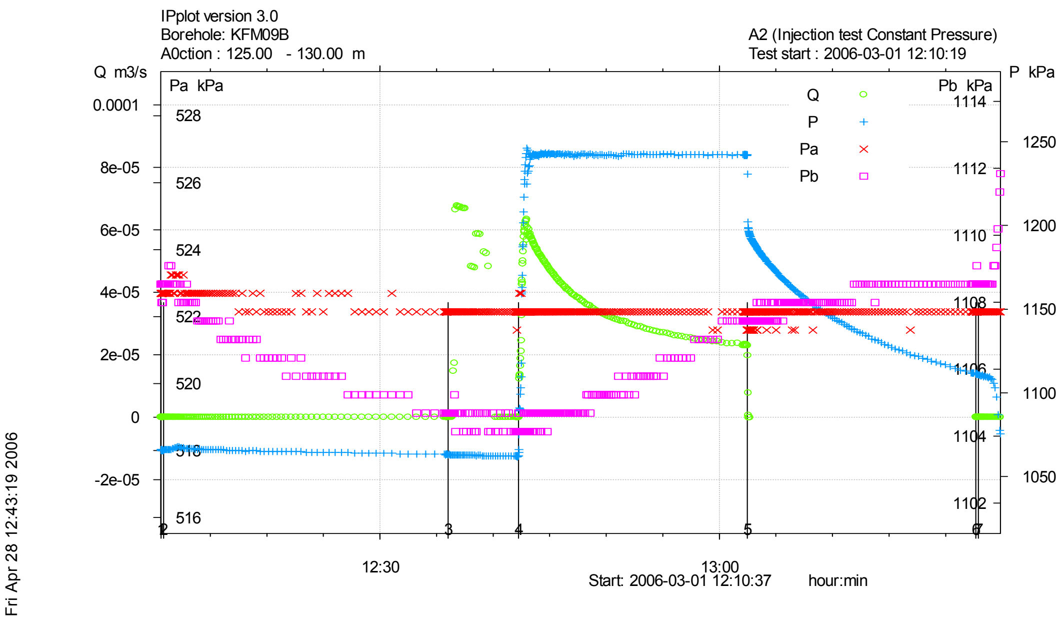


Figure A3-280. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 125.0-130.0 m in borehole KFM09B.*

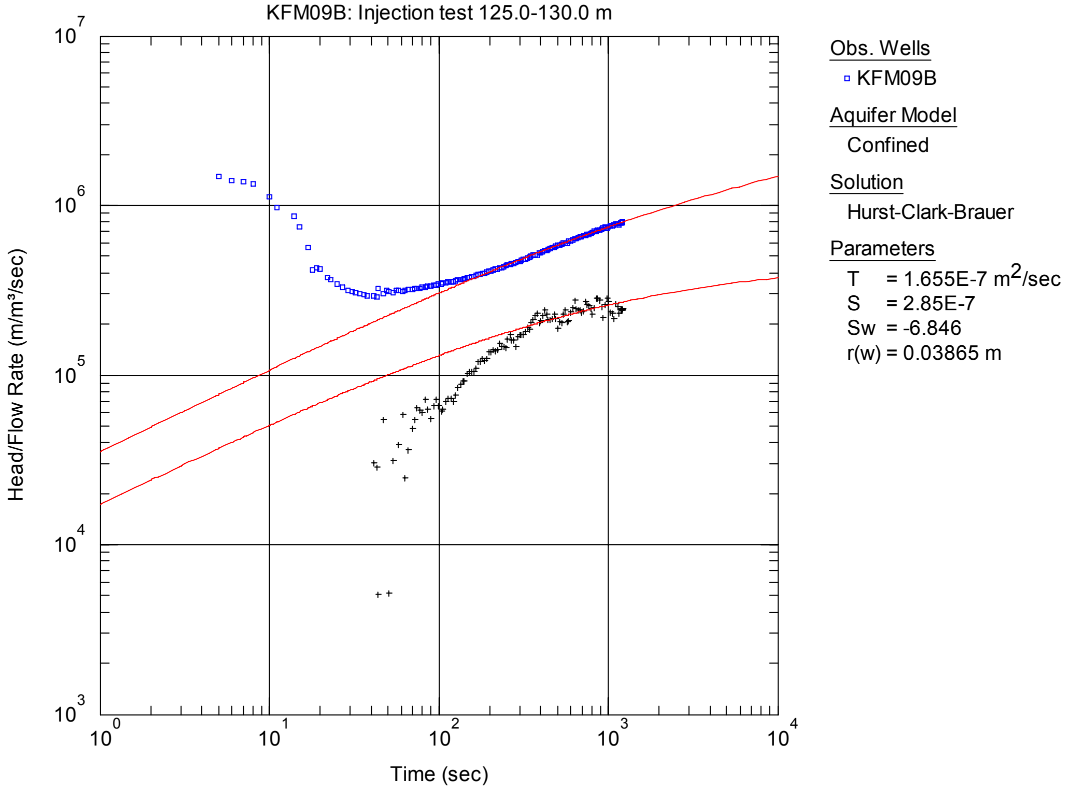


Figure A3-281. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 125.0-130.0 m in KFM09B.*

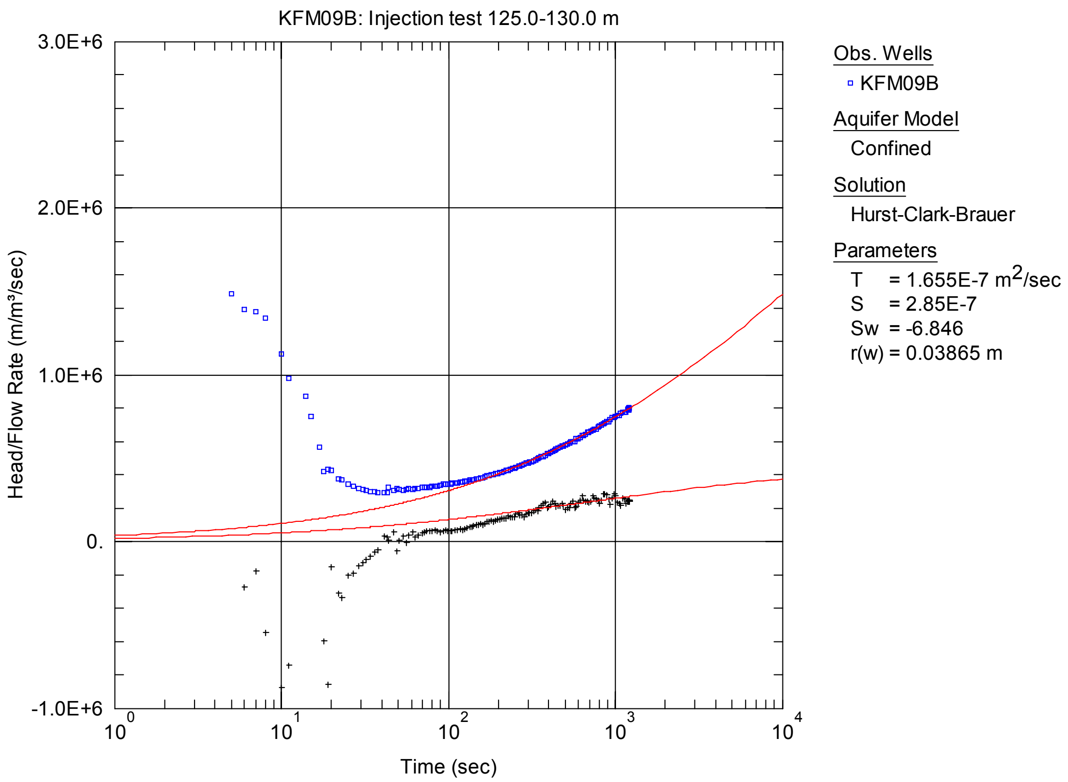


Figure A3-282. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 125.0-130.0 m in KFM09B.*

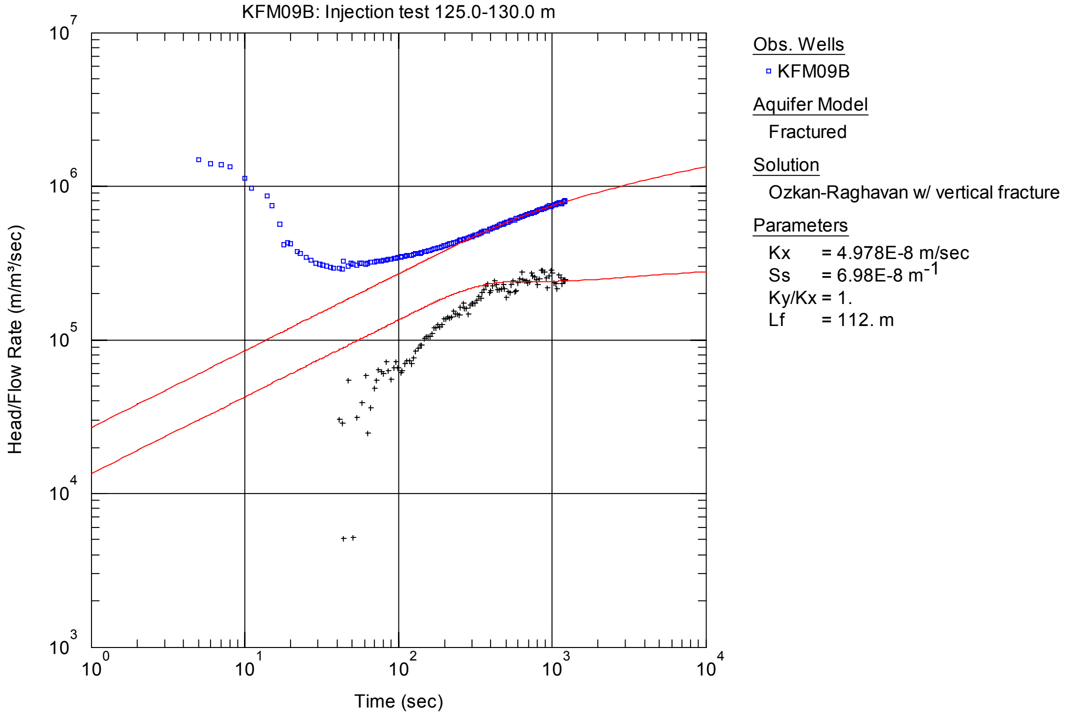


***Figure A3-283.** Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 125.0-130.0 m in KFM09B.*

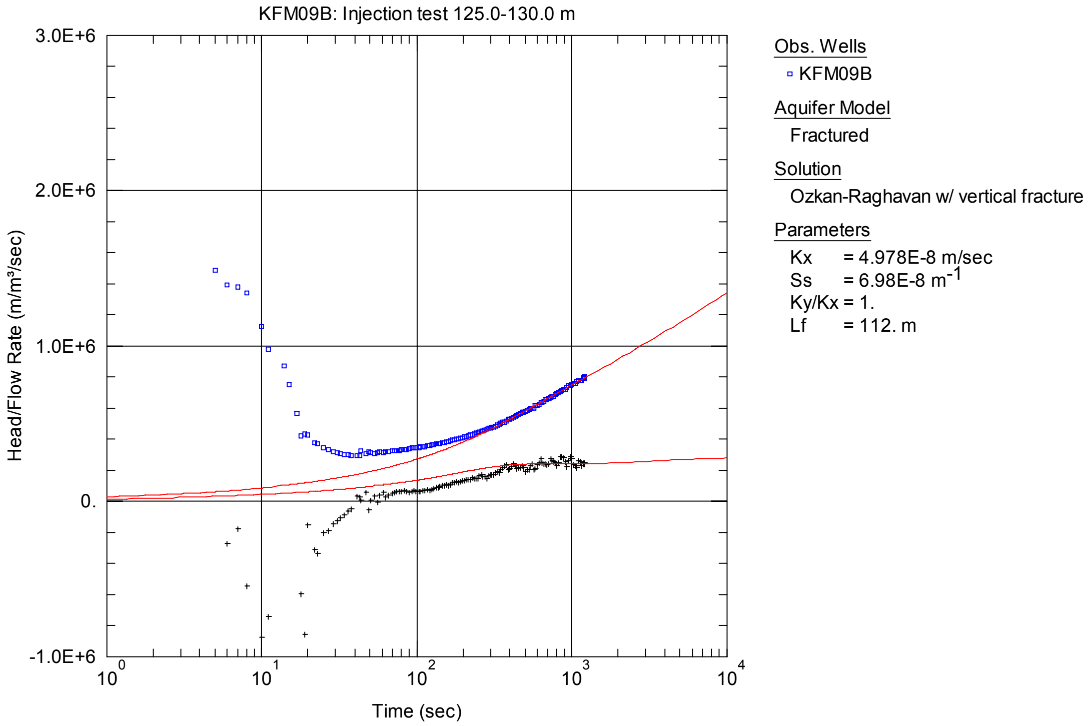


***Figure A3-284.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 125.0-130.0 m in KFM09B.*

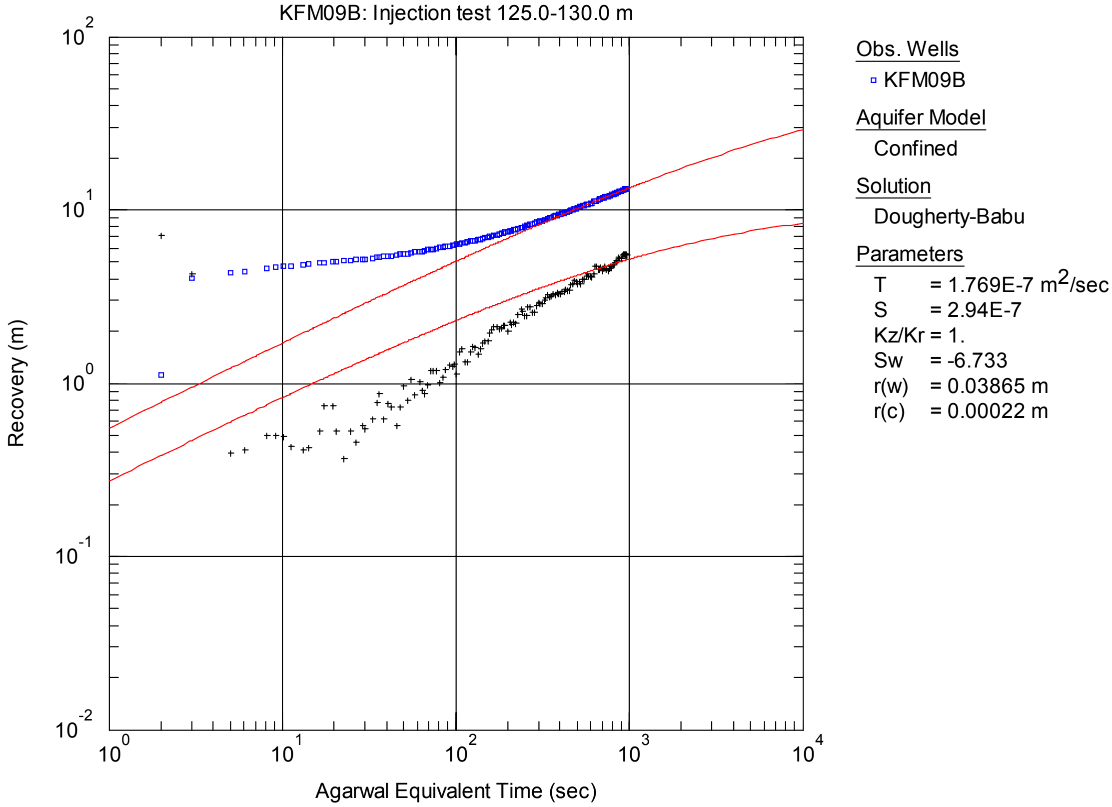


Figure A3-285. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 125.0-130.0 m in KFM09B.*

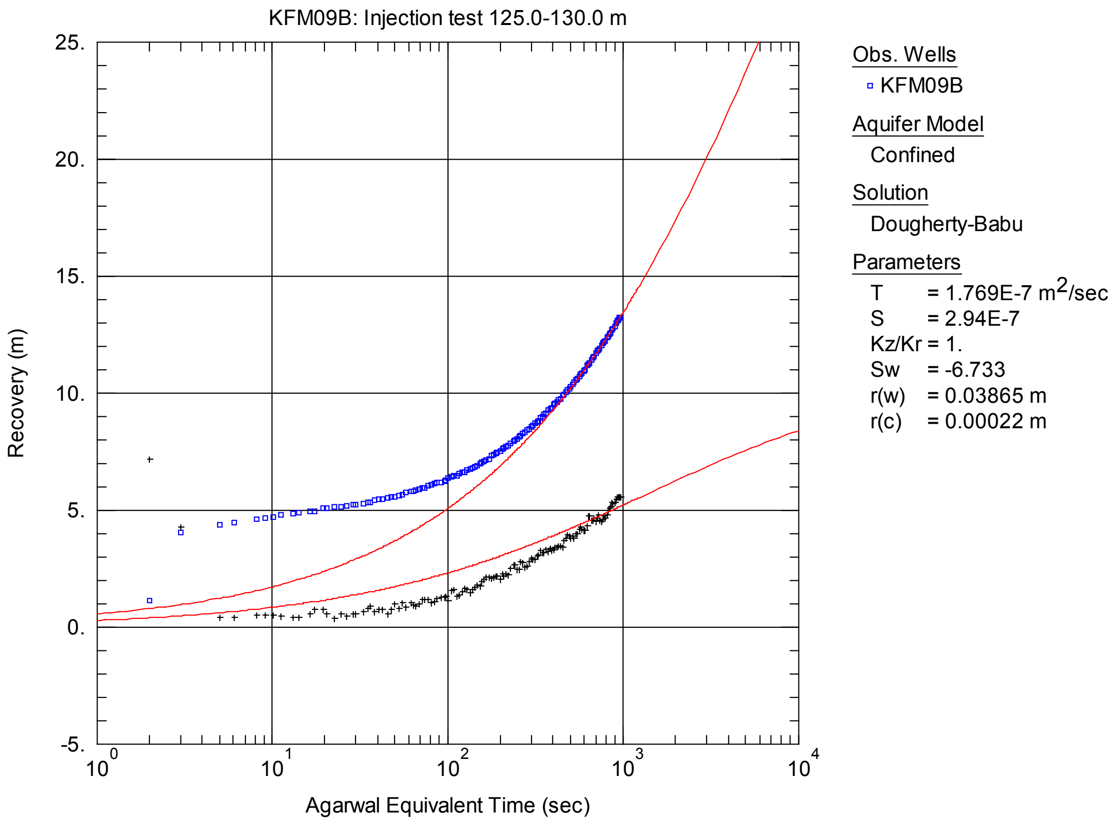


Figure A3-286. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 125.0-130.0 m in KFM09B.*

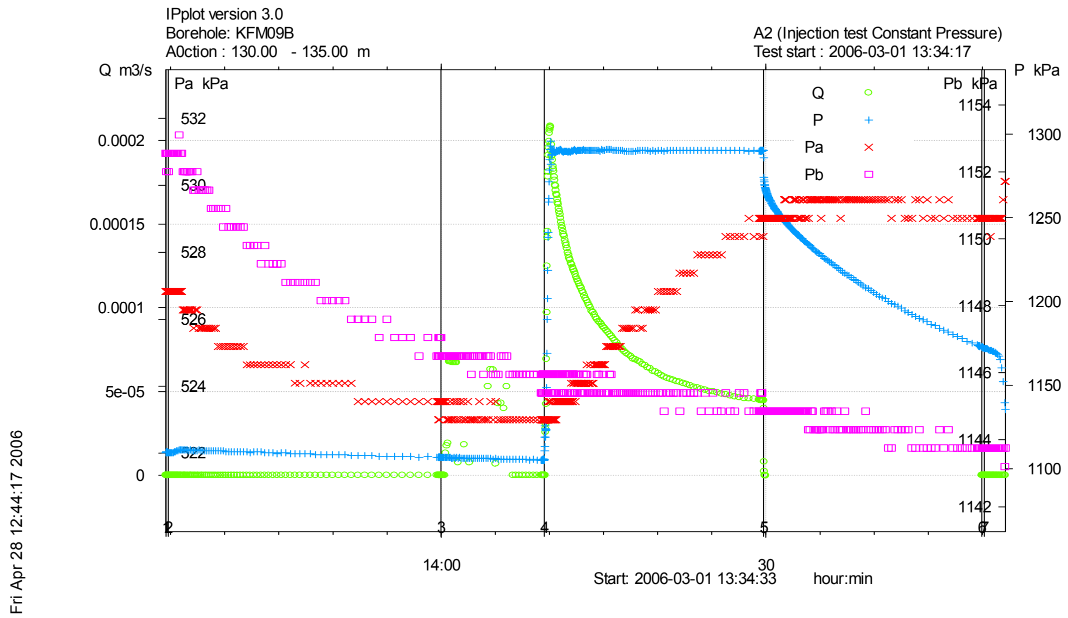


Figure A3-287. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 130.0-135.0 m in borehole KFM09B.

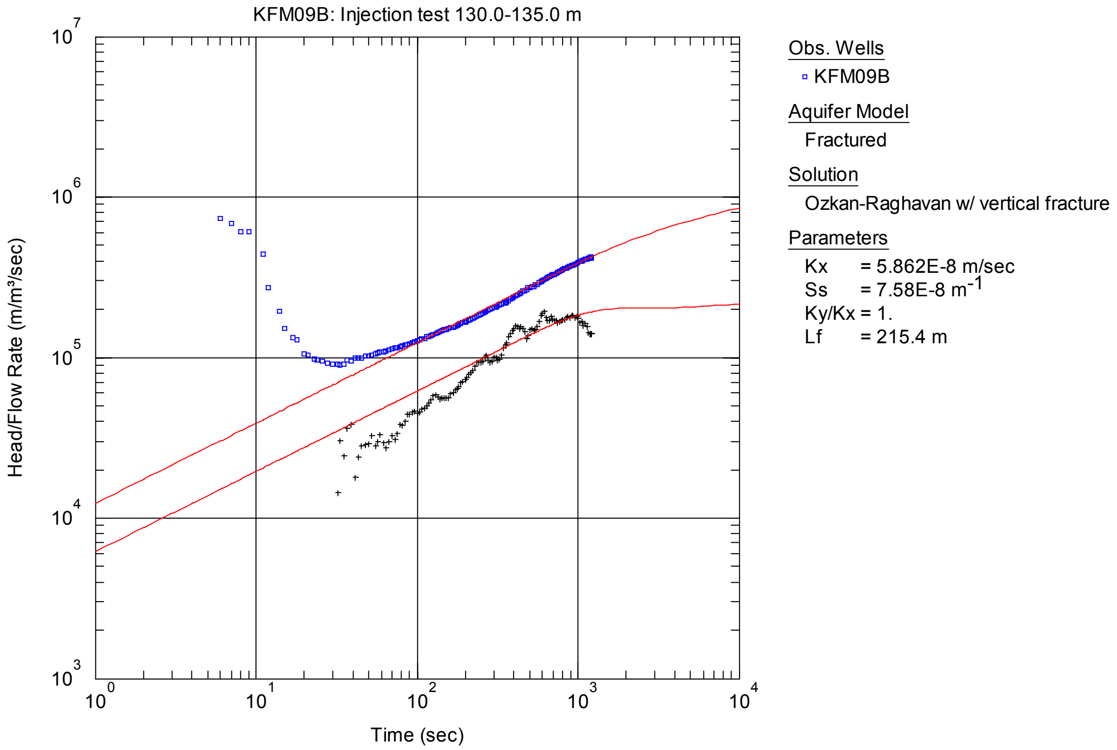


Figure A3-288. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 130.0-135.0 m in KFM09B.

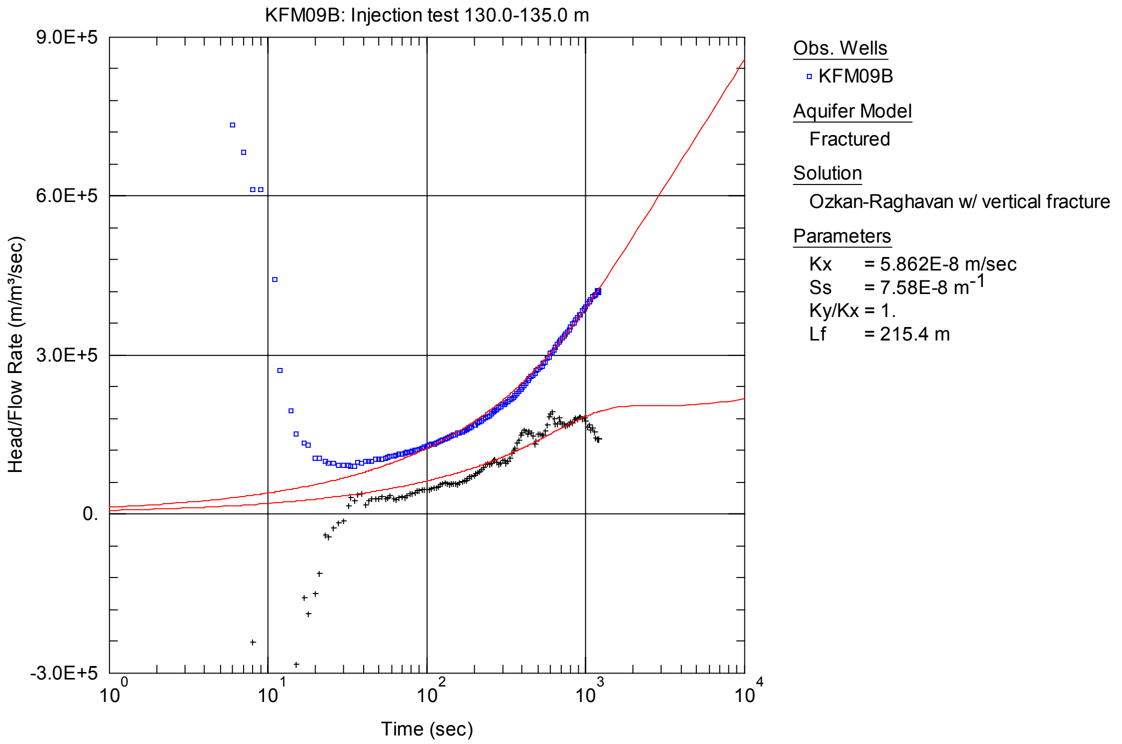


Figure A3-289. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 130.0-135.0 m in KFM09B.*

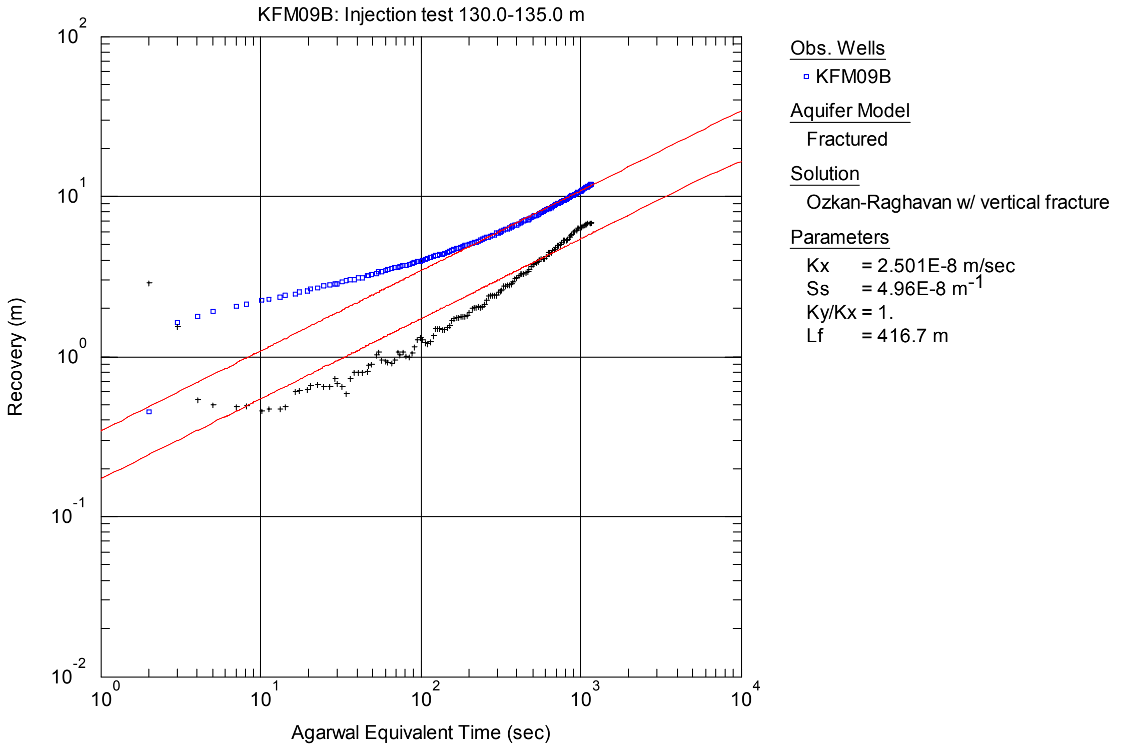


Figure A3-290. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 130.0-135.0 m in KFM09B.*

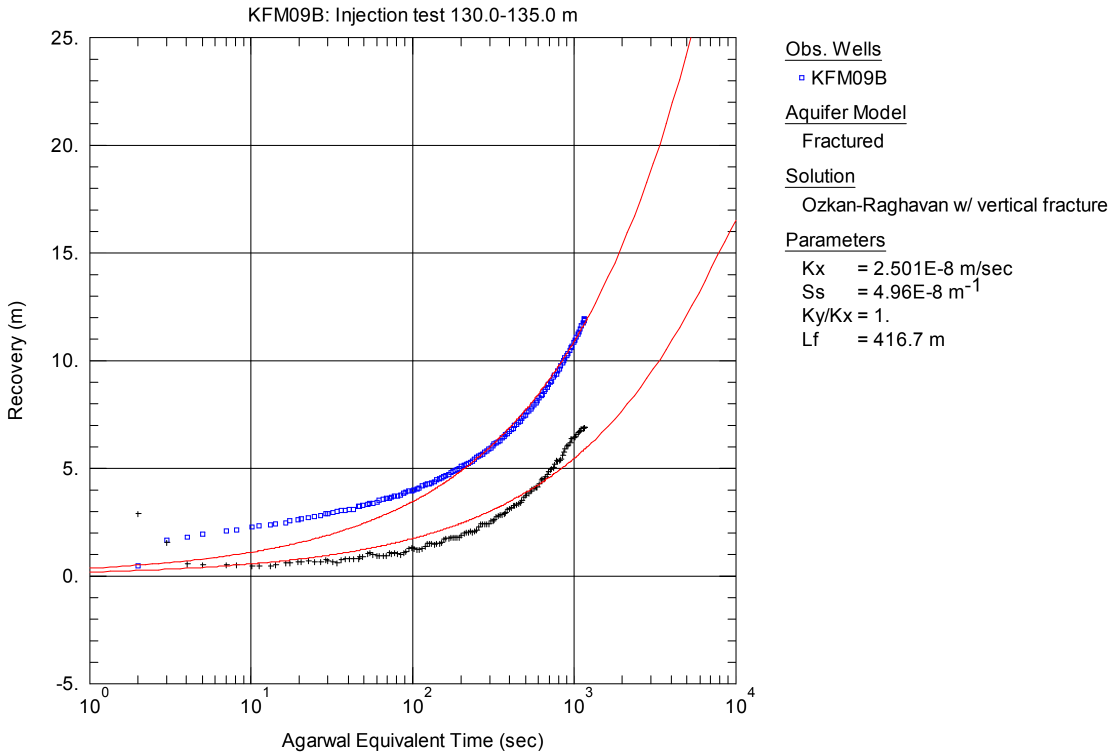


Figure A3-291. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 130.0-135.0 m in KFM09B.*

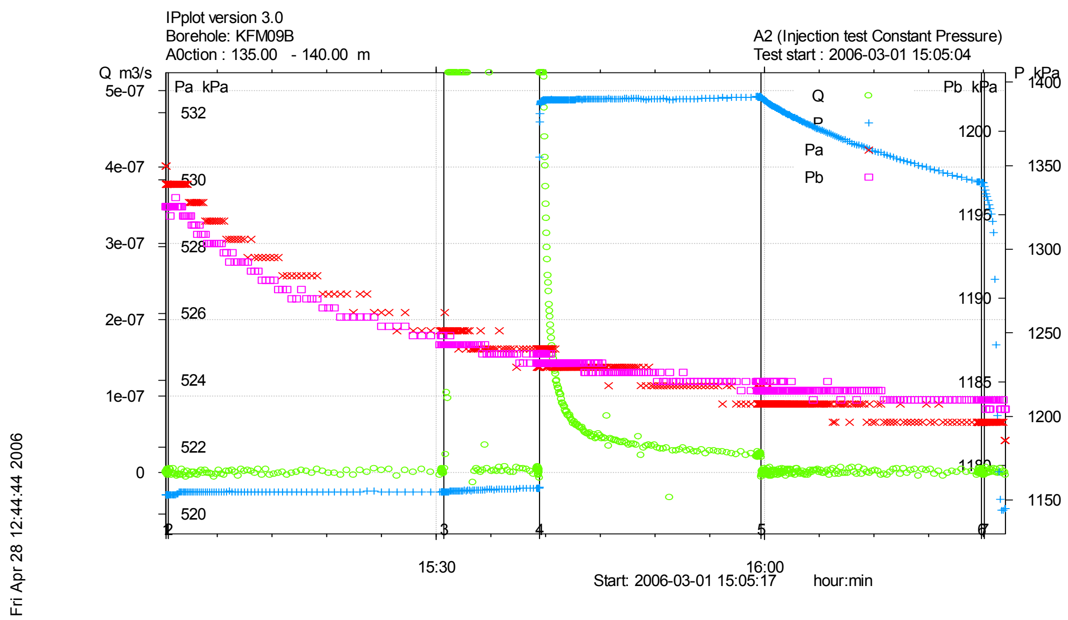


Figure A3-292. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 135.0-140.0 m in borehole KFM09B.*

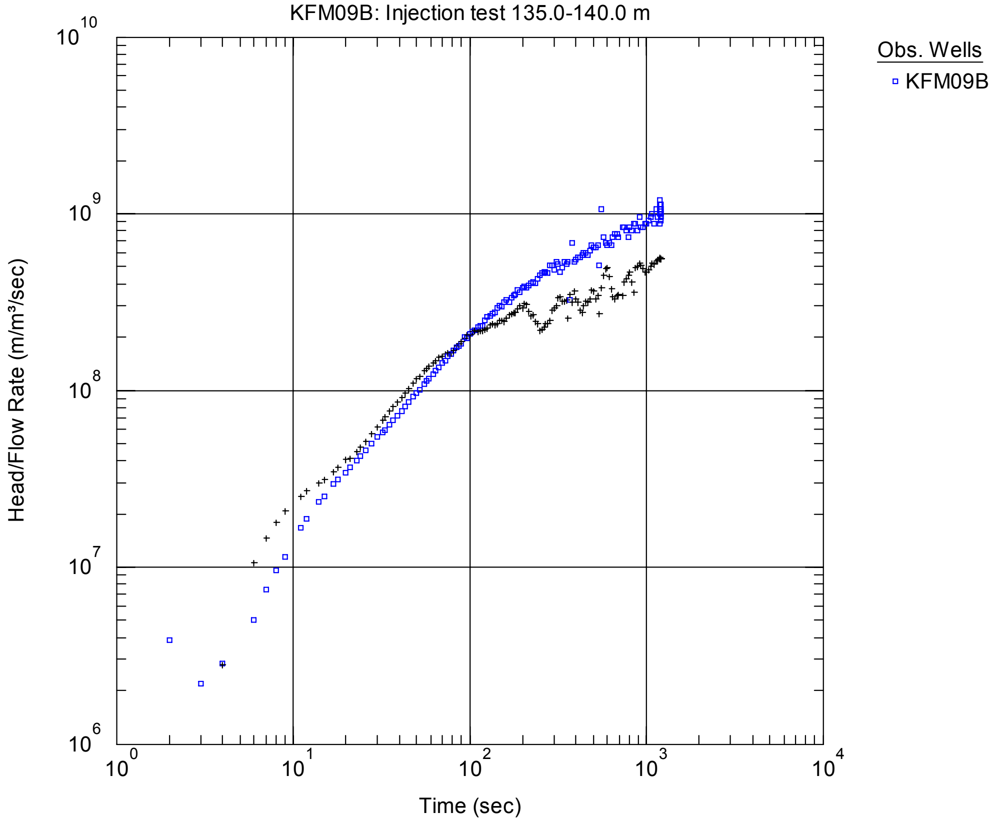


Figure A3-293. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 135.0-140.0 m in KFM09B.*

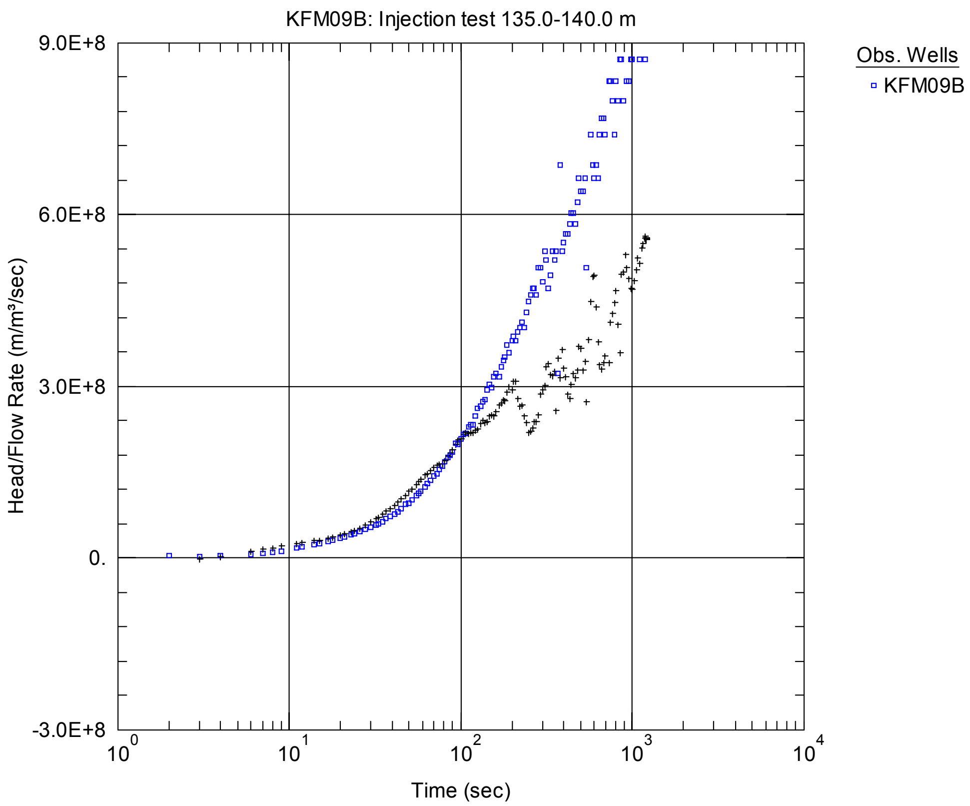


Figure A3-294. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 135.0-140.0 m in KFM09B.*

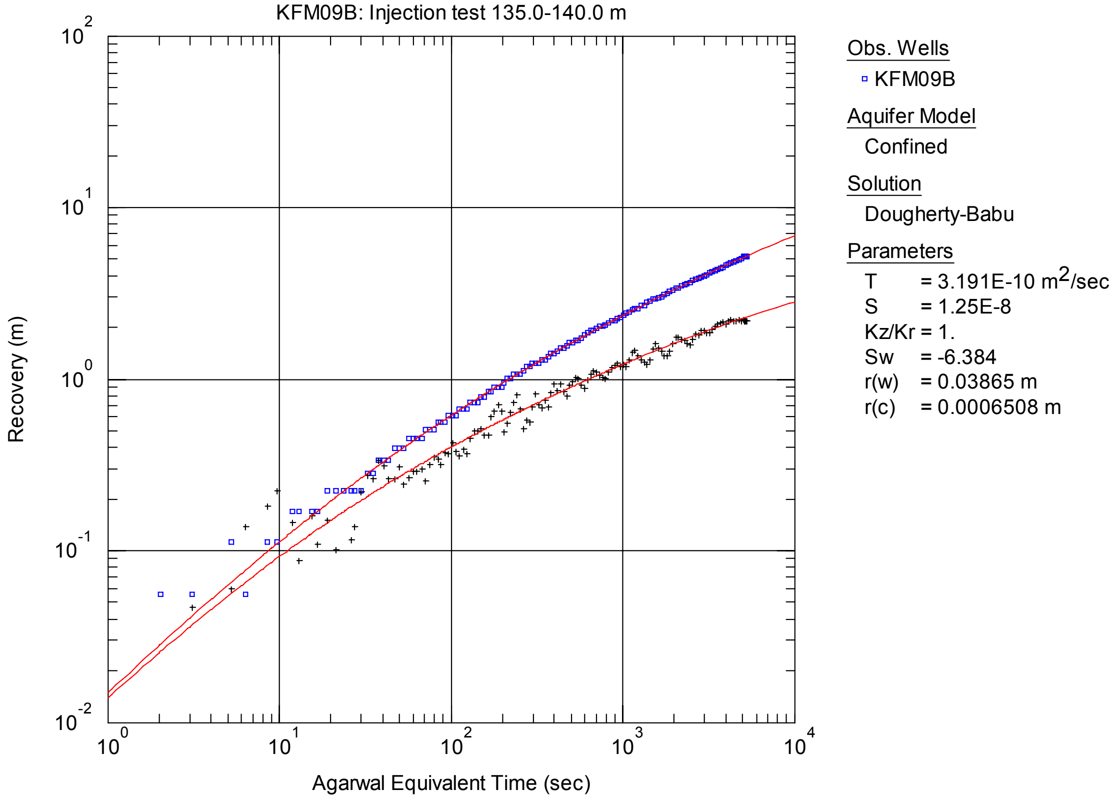


Figure A3-295. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Dougherty-Babu solution, from the injection test in section 135.0-140.0 m in KFM09B.*

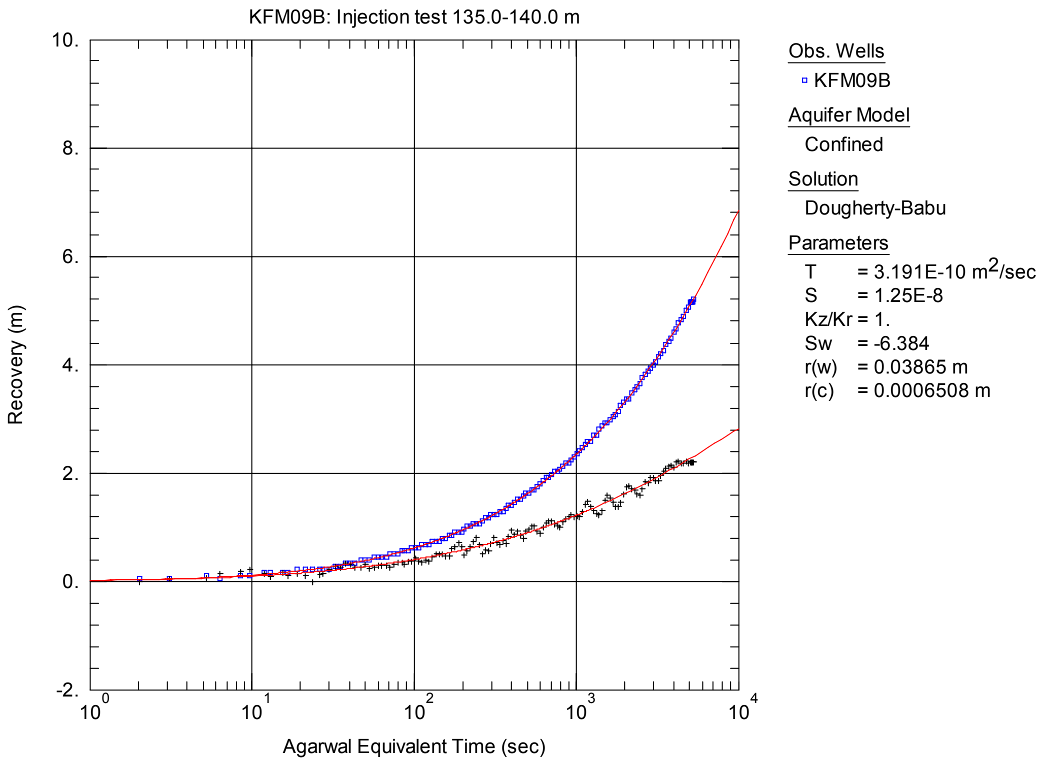


Figure A3-296. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Dougherty-Babu solution, from the injection test in section 135.0-140.0 m in KFM09B.*

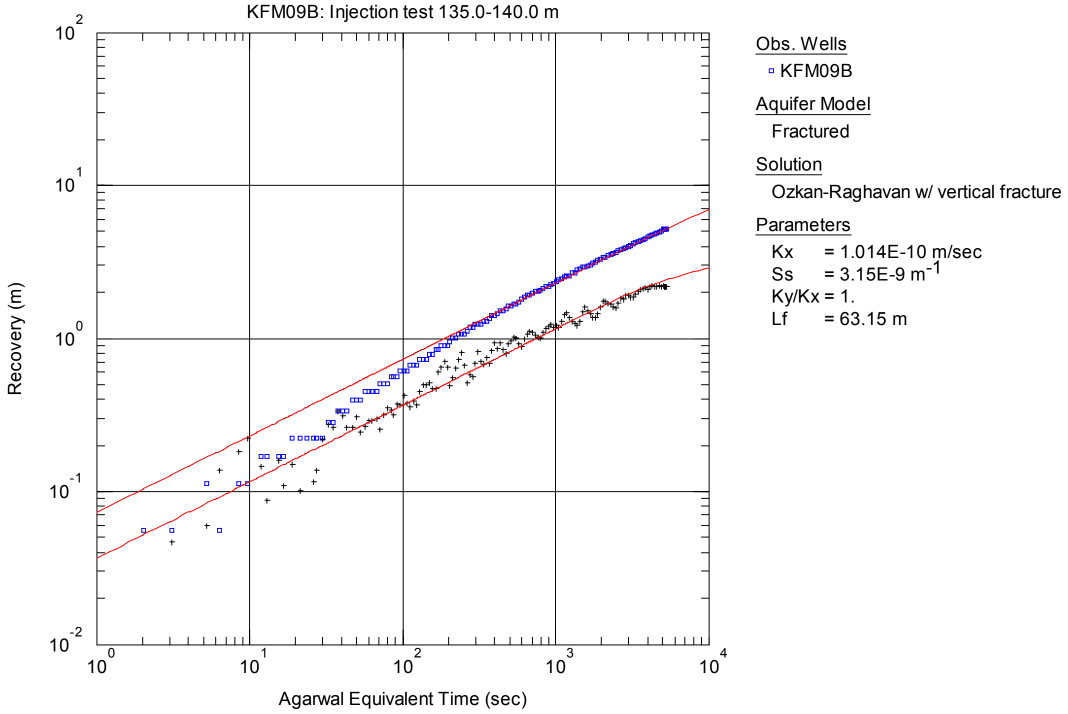


Figure A3-297. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 135.0-140.0 m in KFM09B.*

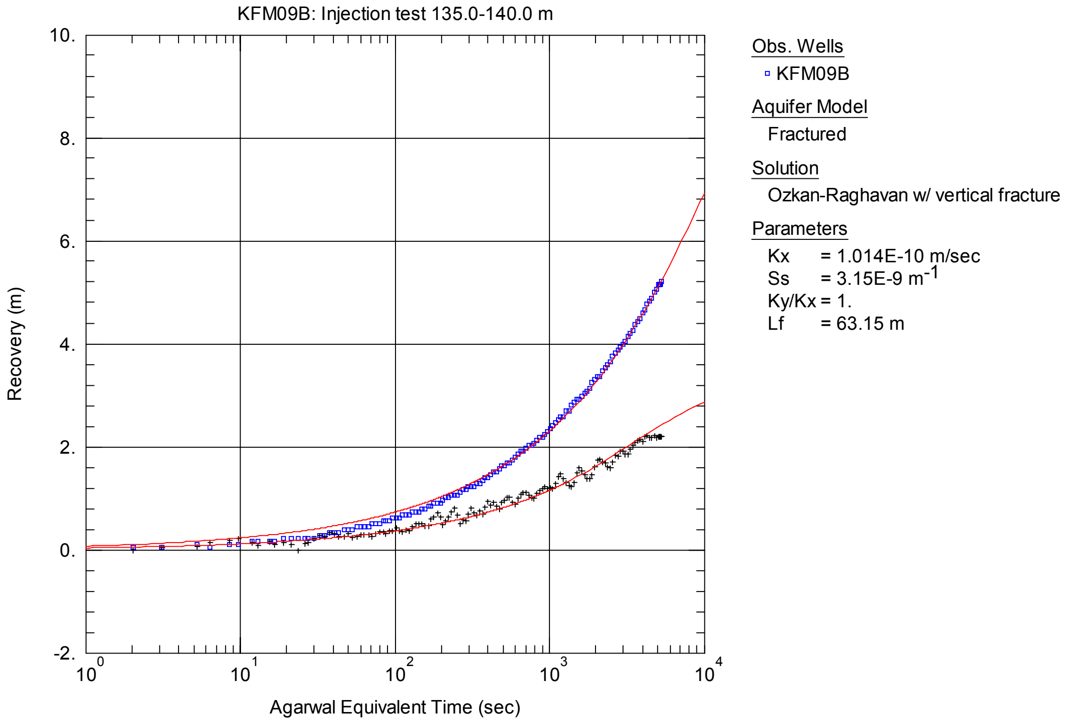


Figure A3-298. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 135.0-140.0 m in KFM09B.*

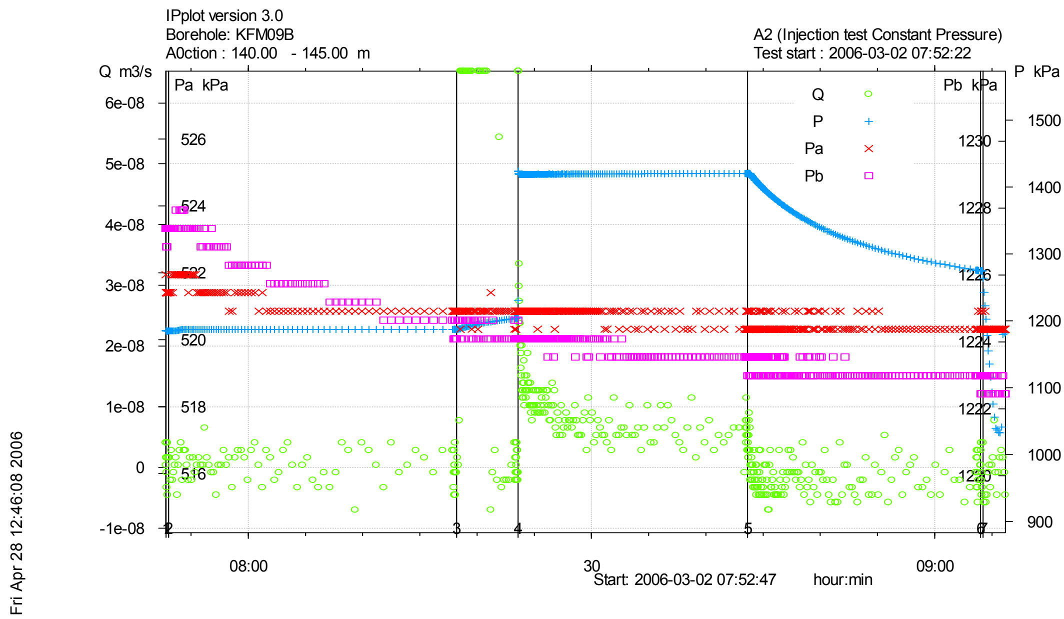


Figure A3-299. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 140.0-145.0 m in borehole KFM09B.*

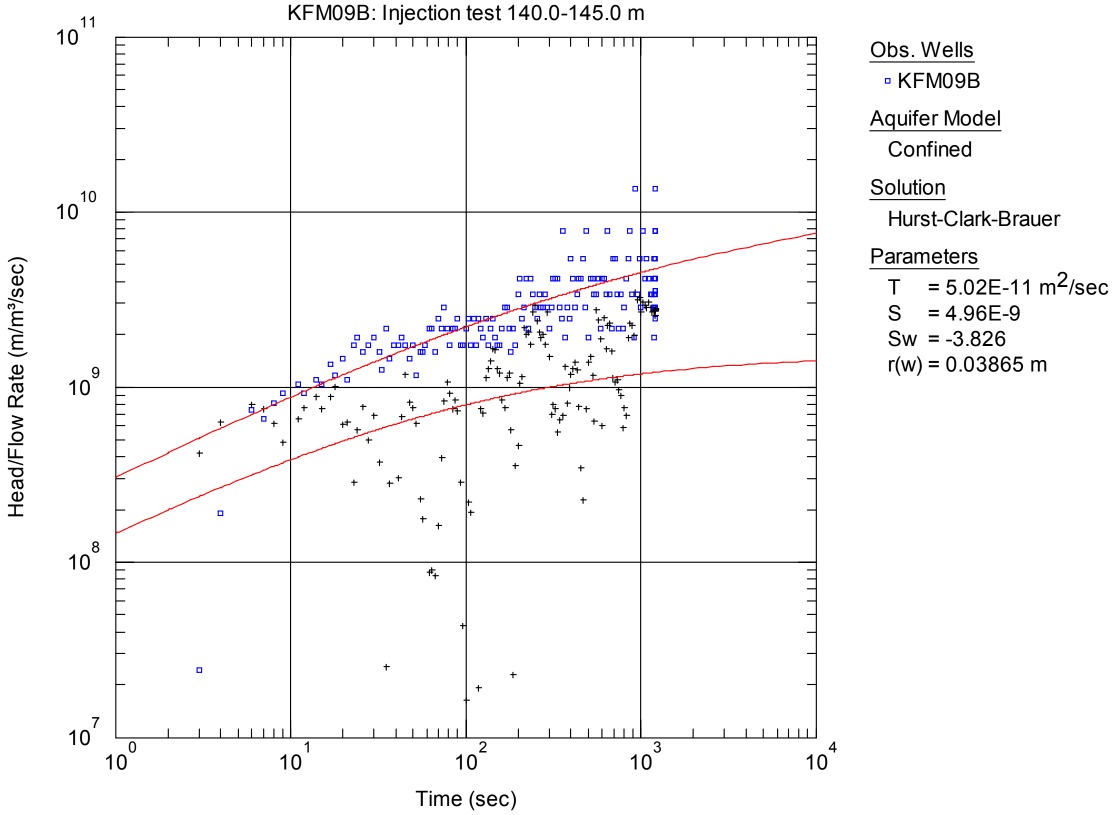


Figure A3-300. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 140.0-145.0 m in KFM09B.*

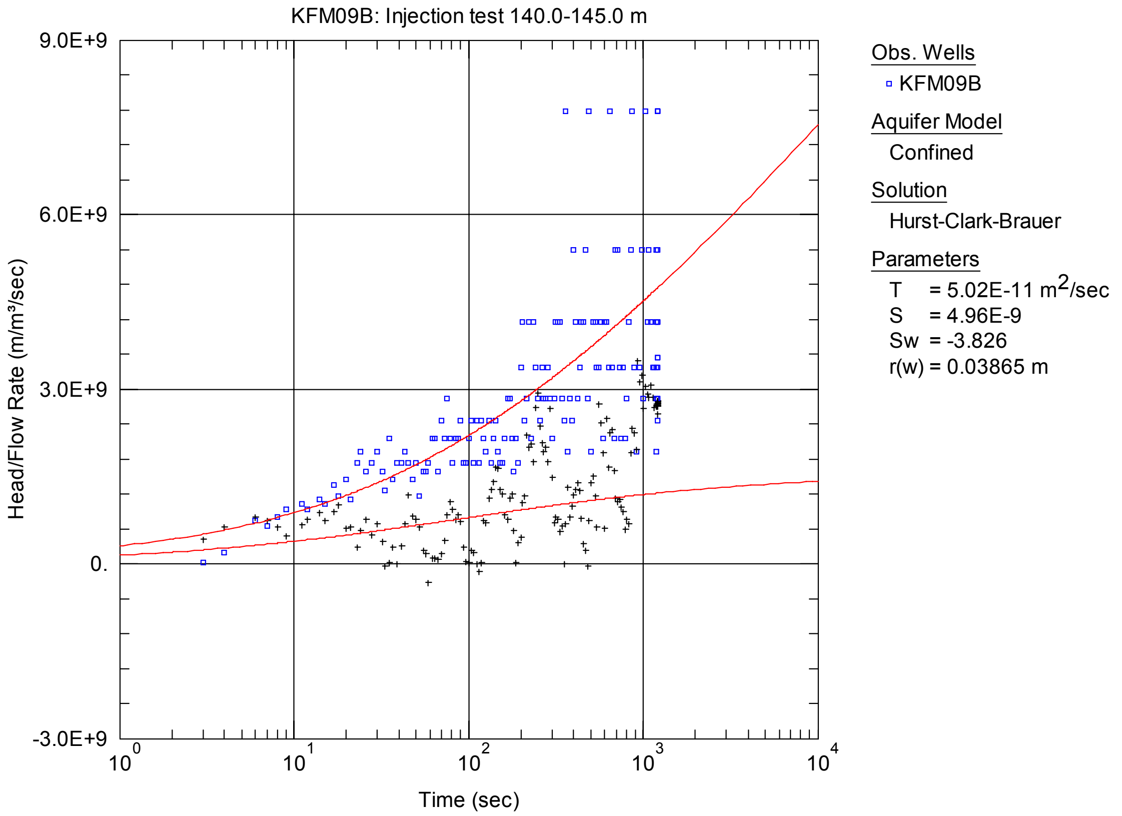


Figure A3-301. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 140.0-145.0 m in KFM09B.*

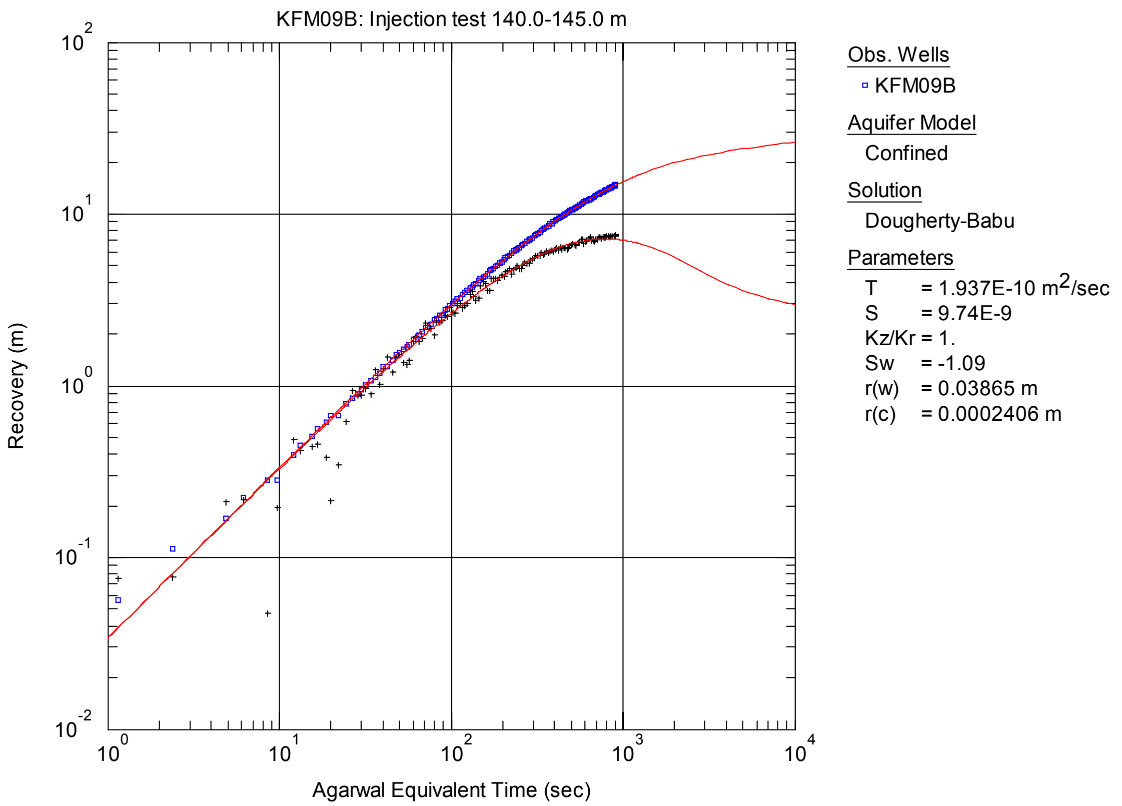


Figure A3-302. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 140.0-145.0 m in KFM09B.*

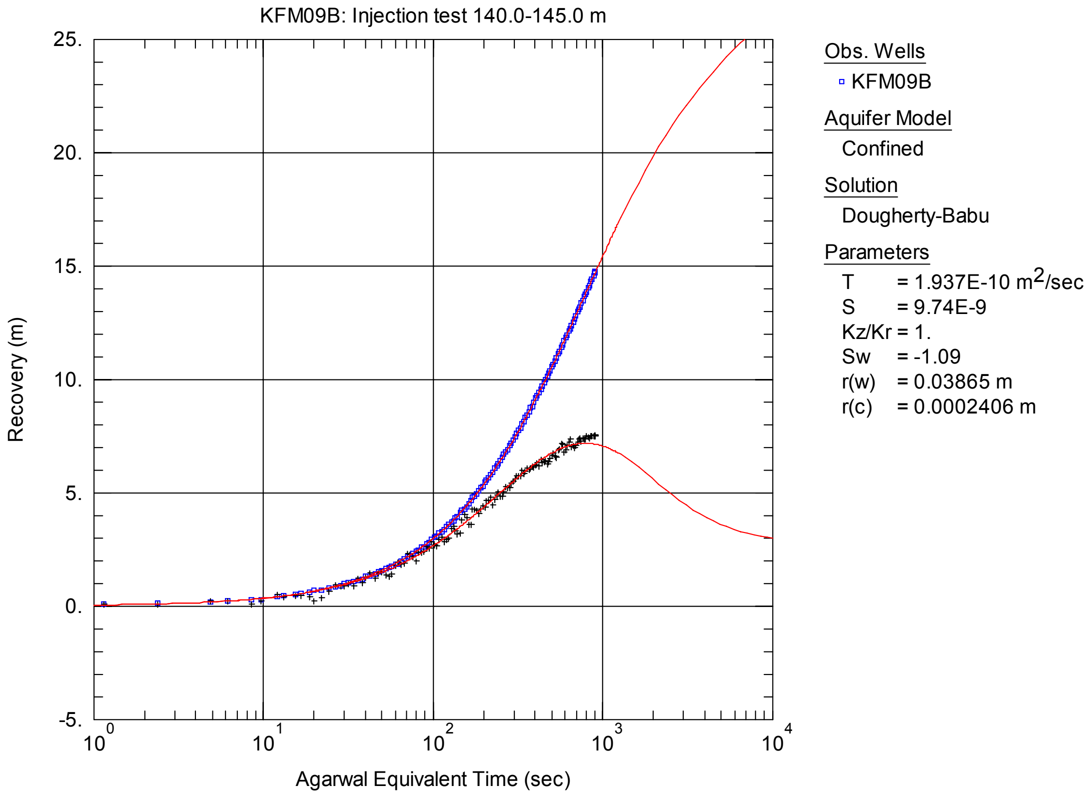


***Figure A3-303.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 140.0-145.0 m in KFM09B.*

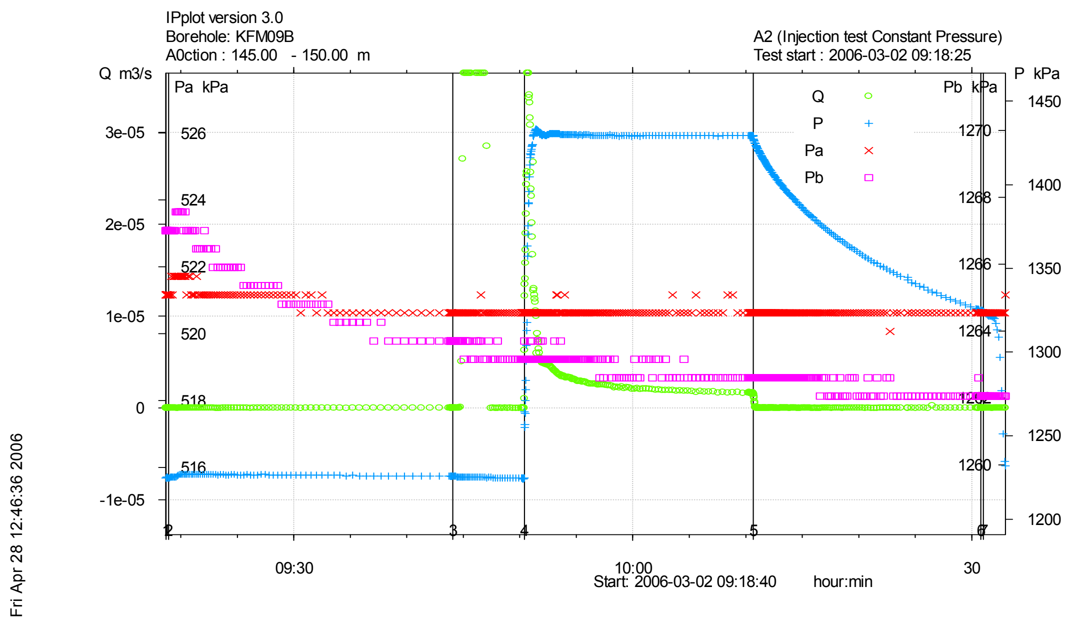


***Figure A3-304.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 145.0-150.0 m in borehole KFM09B.*

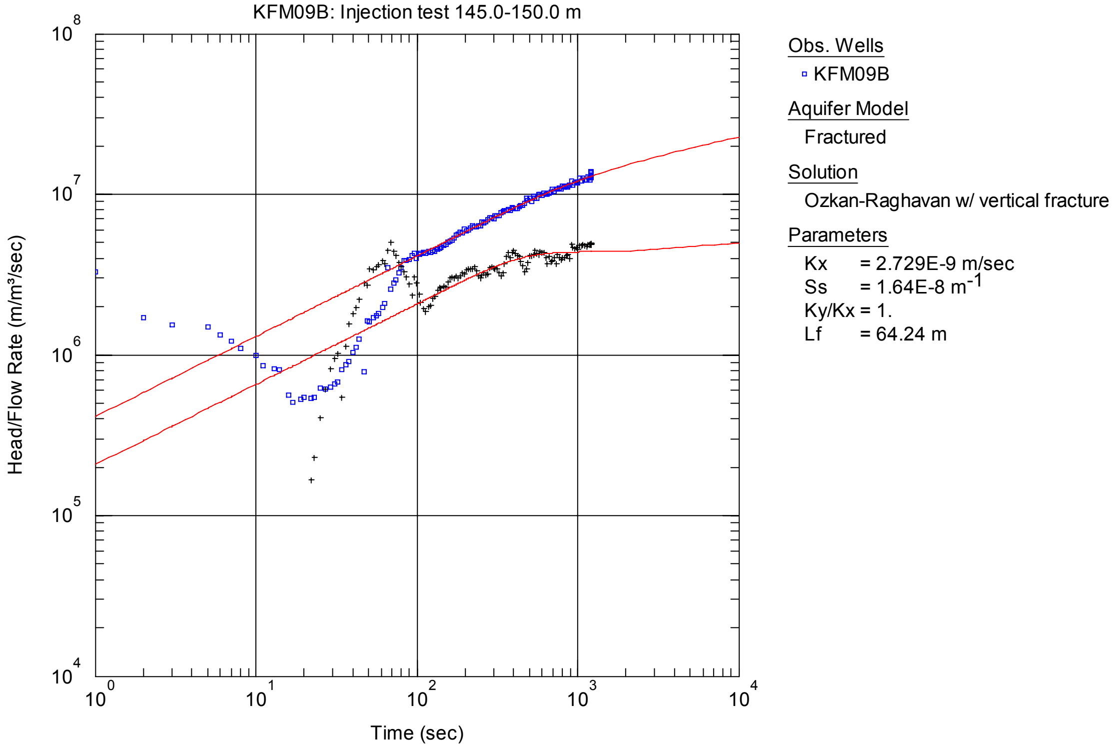


***Figure A3-305.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 145.0-150.0 m in KFM09B.*

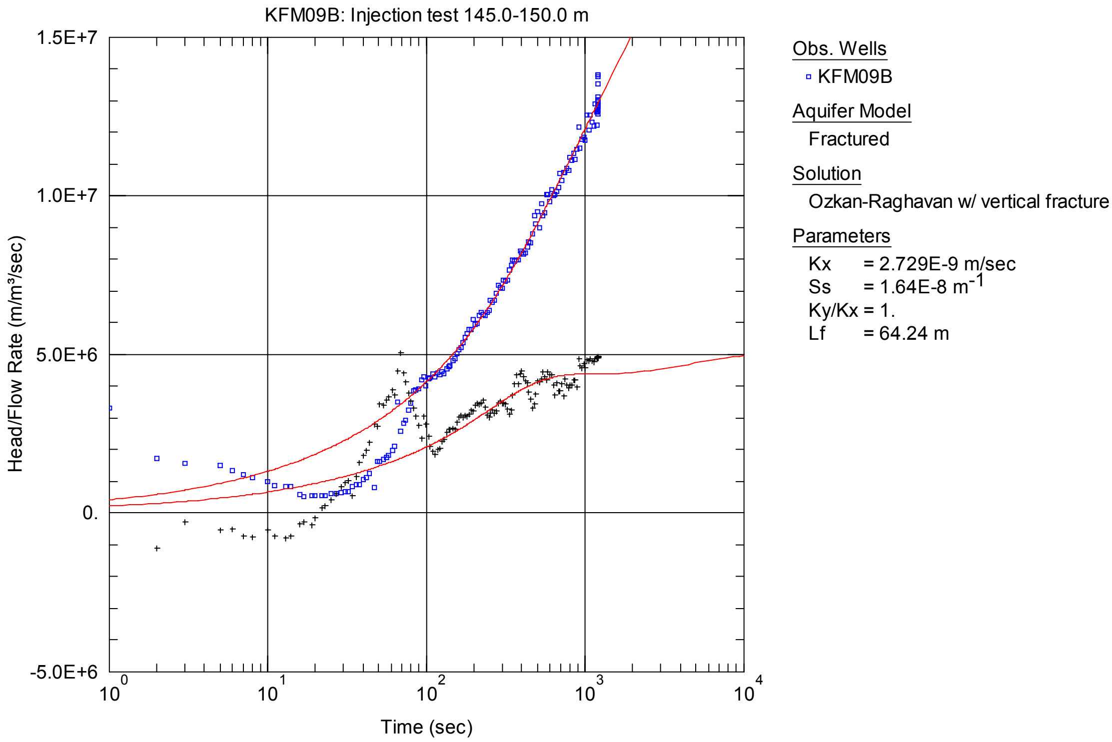


***Figure A3-306.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 145.0-150.0 m in KFM09B.*

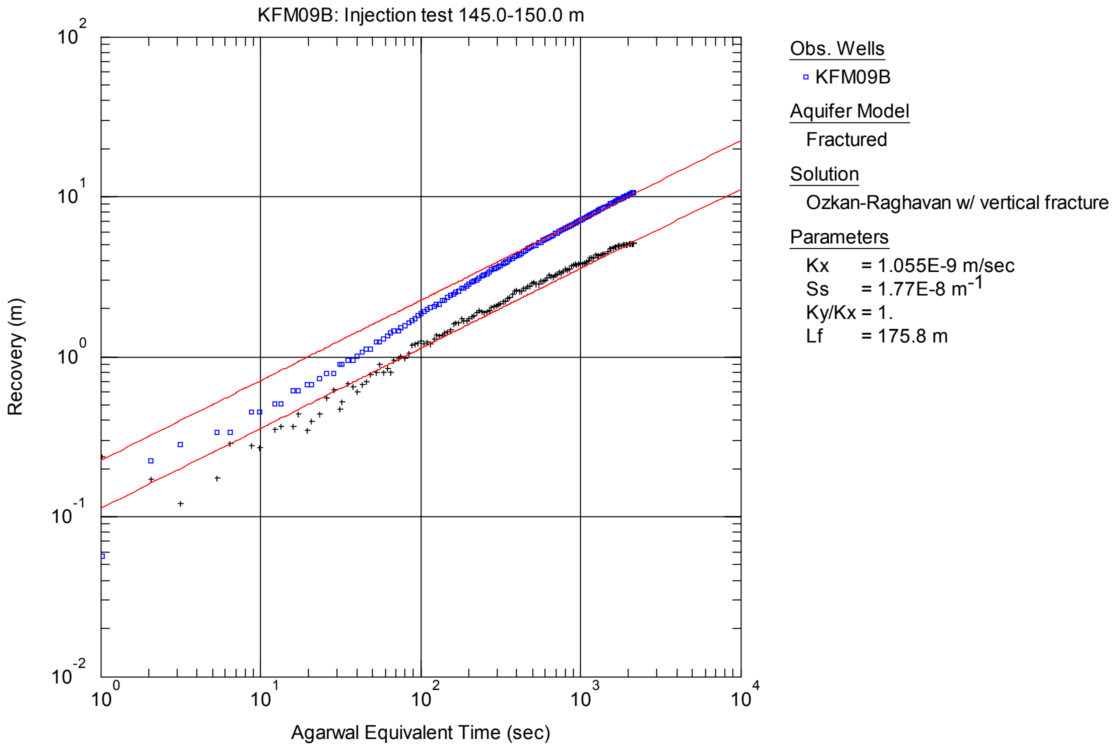


Figure A3-307. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 145.0-150.0 m in KFM09B.*

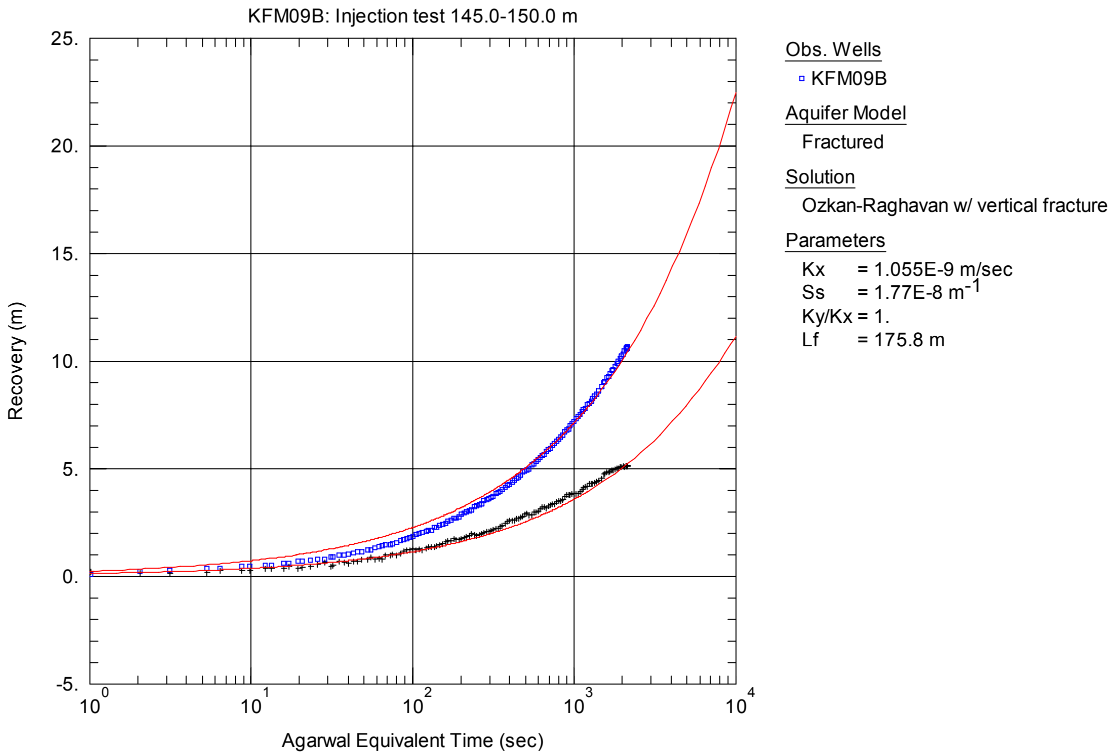


Figure A3-308. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 145.0-150.0 m in KFM09B.*

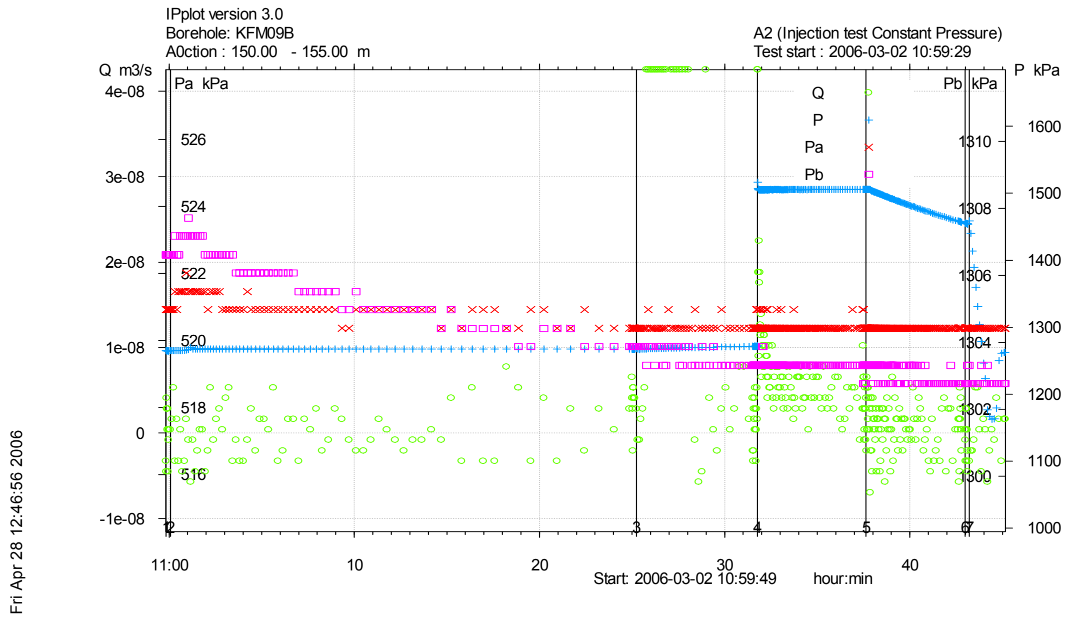


Figure A3-309. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 150.0-155.0 m in borehole KFM09B.*

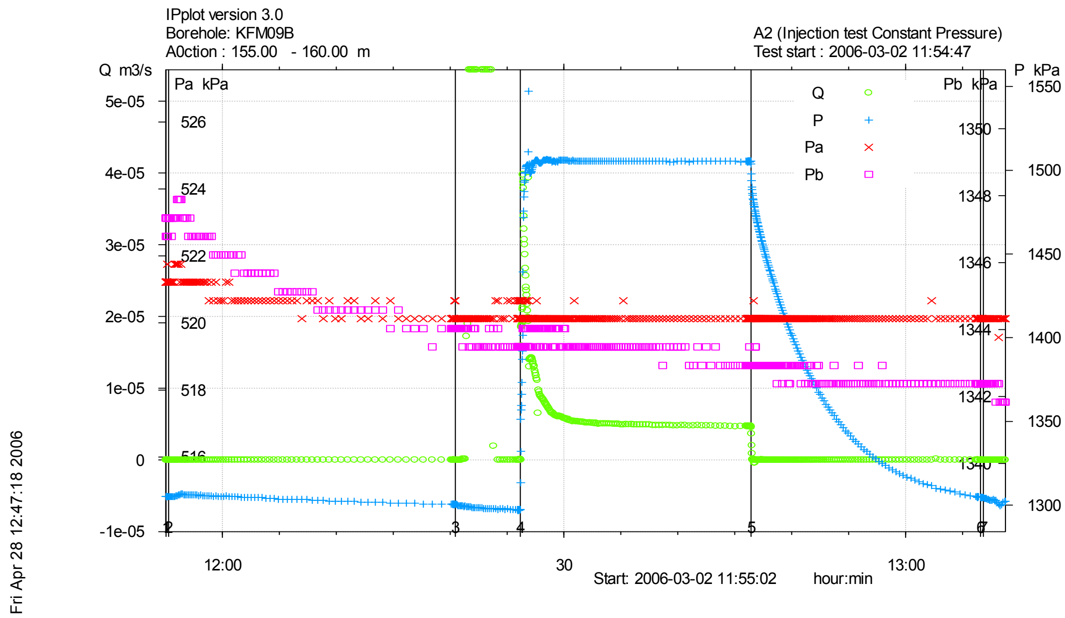


Figure A3-310. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 155.0-160.0 m in borehole KFM09B.*

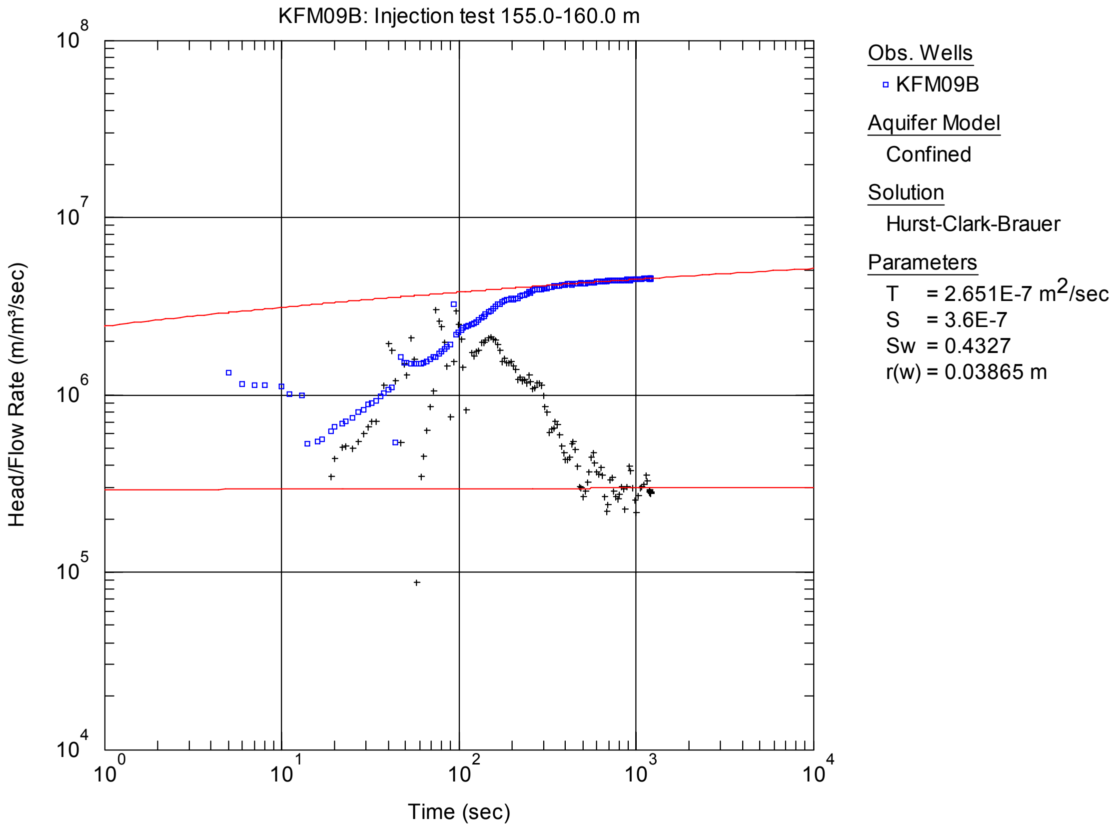


Figure A3-311. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 155.0-160.0 m in KFM09B.*

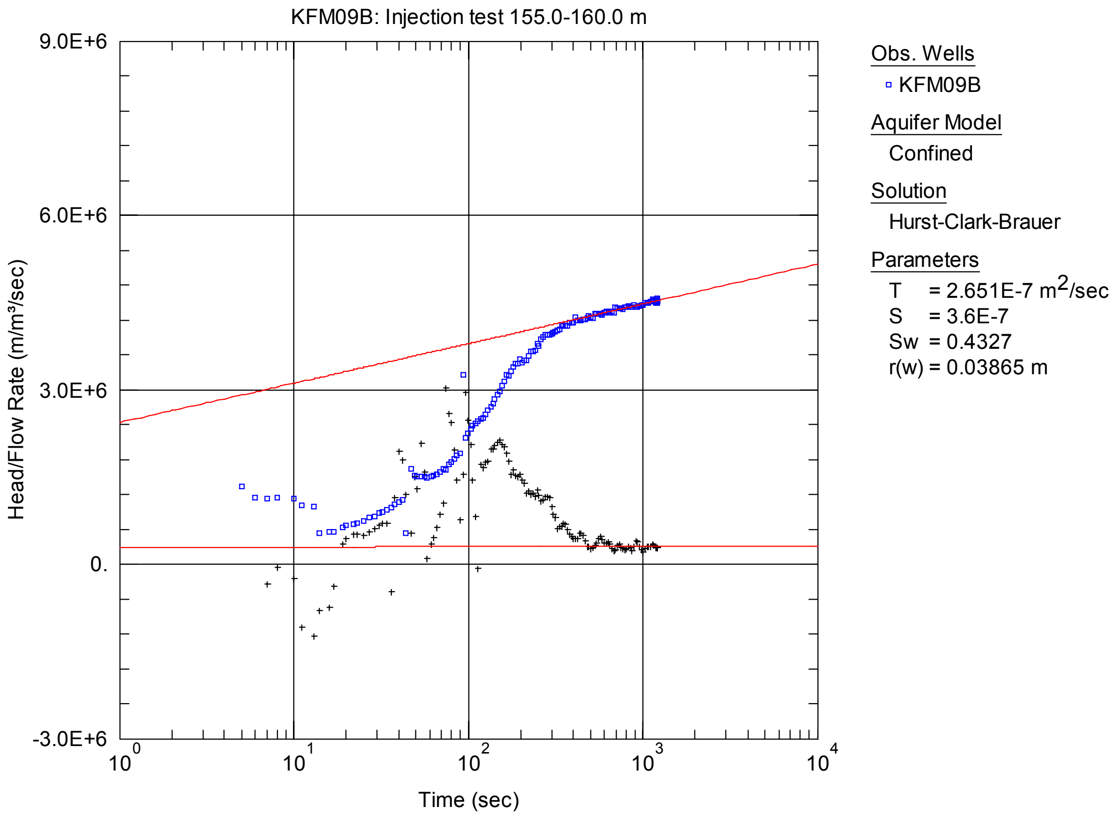


Figure A3-312. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 155.0-160.0 m in KFM09B.*

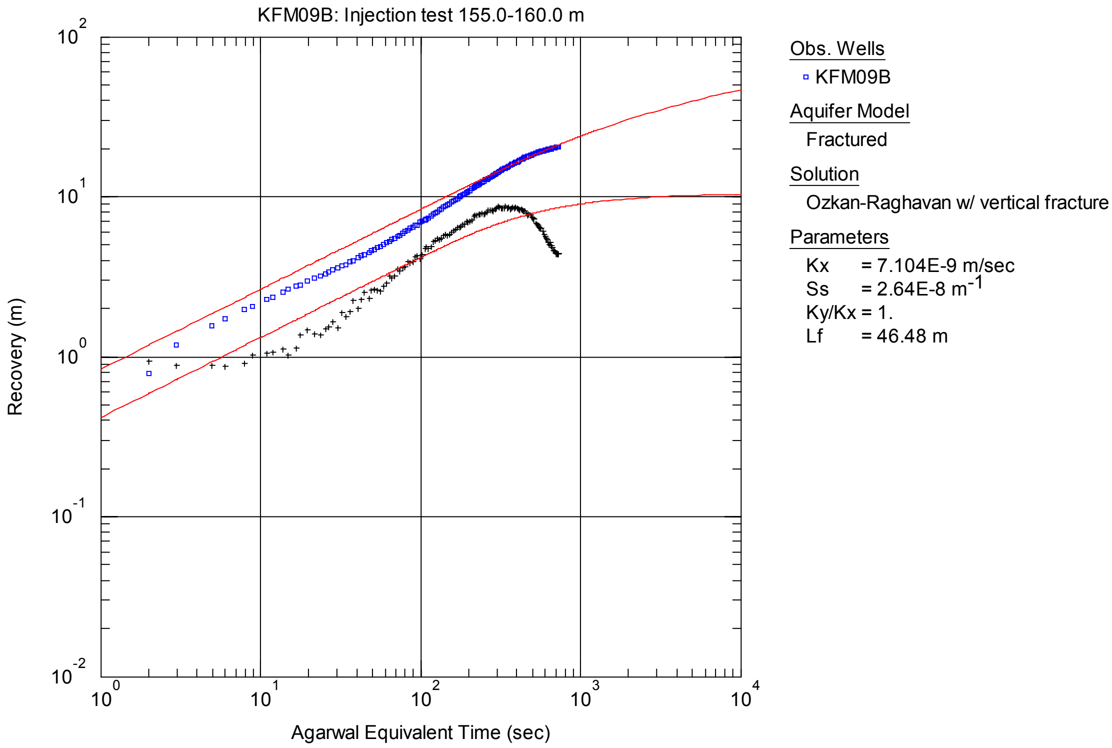


Figure A3-313. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 155.0-160.0 m in KFM09B.*

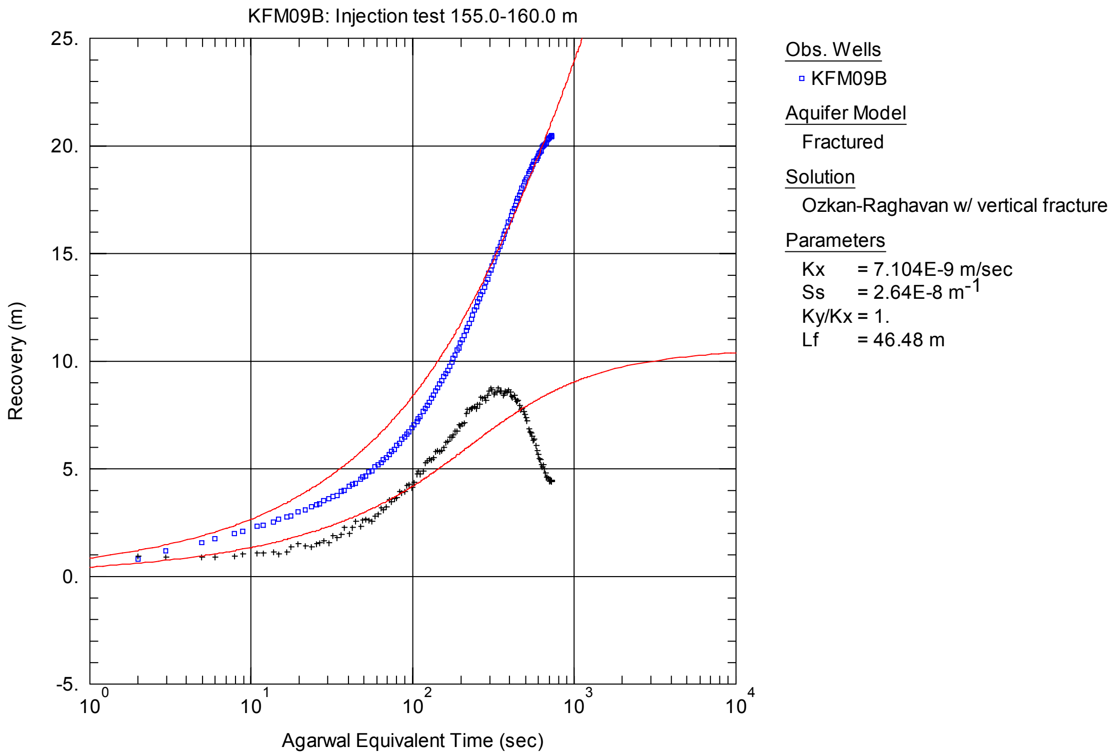


Figure A3-314. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 155.0-160.0 m in KFM09B.*

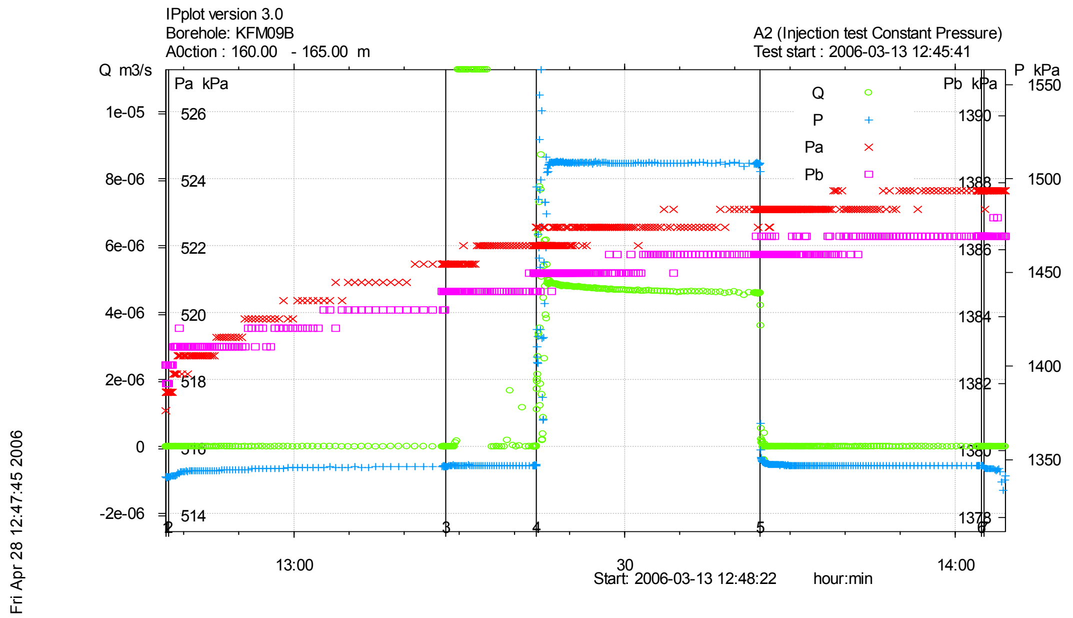


***Figure A3-315.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 160.0-165.0 m in borehole KFM09B.*

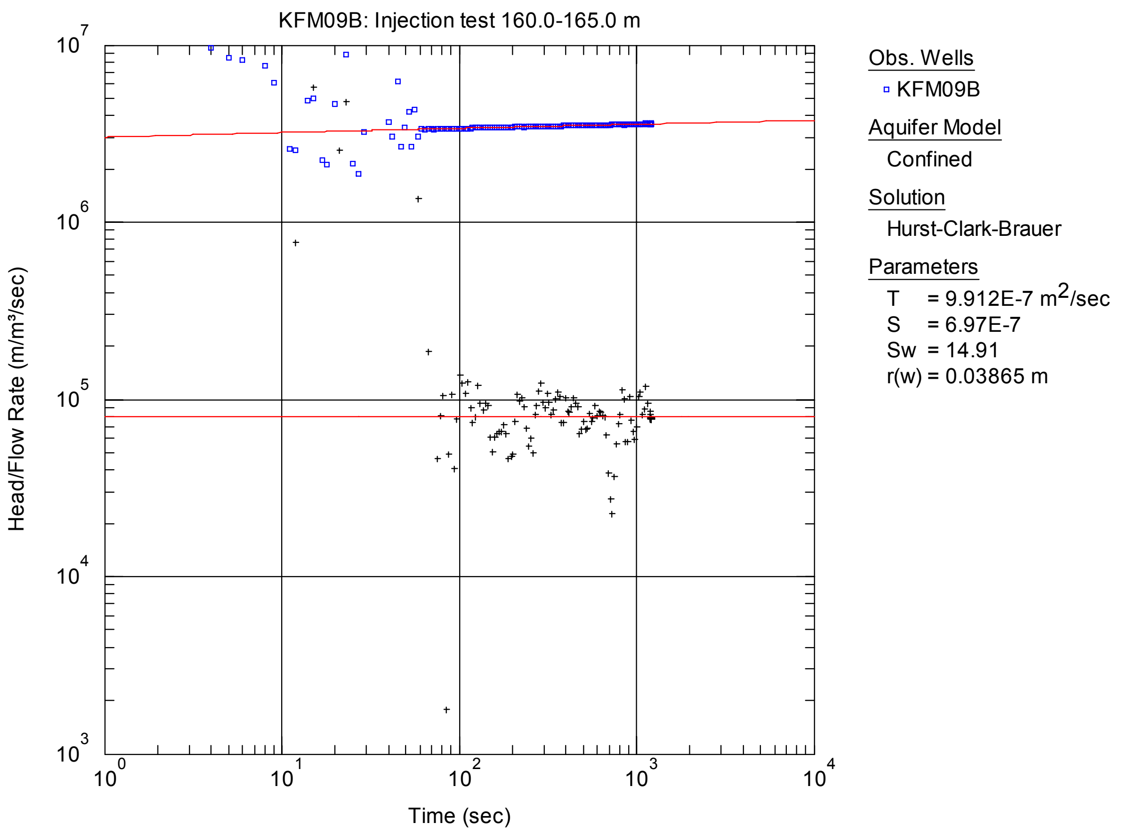


***Figure A3-316.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 160.0-165.0 m in KFM09B.*

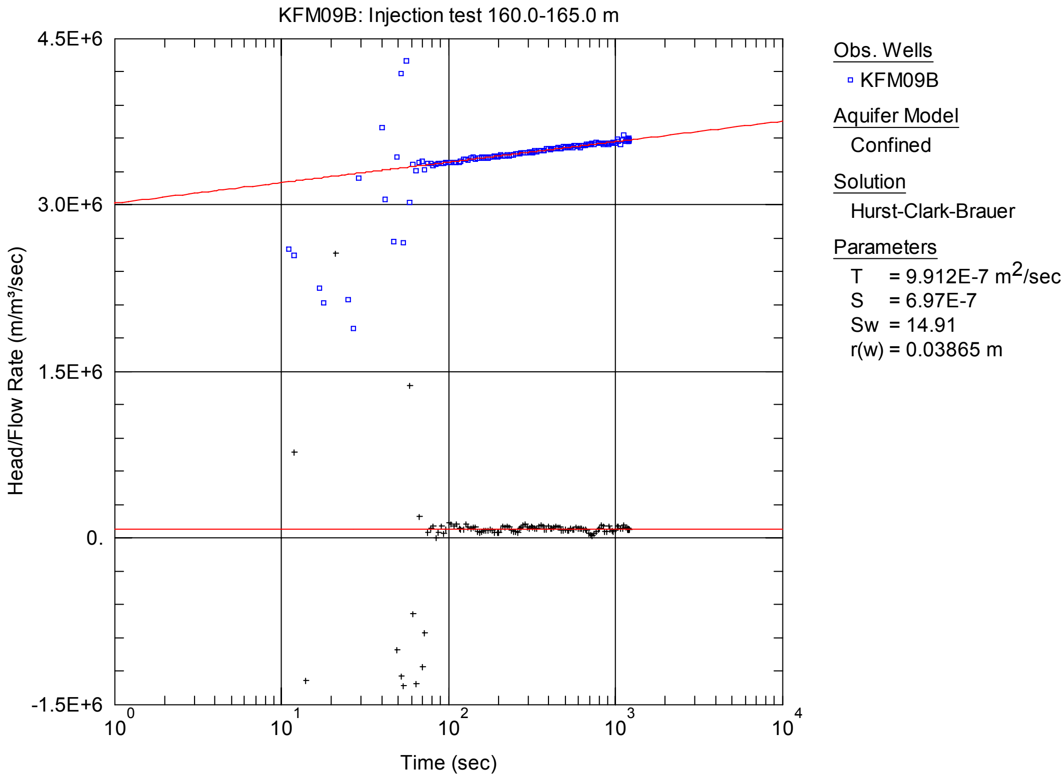


Figure A3-317. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 160.0-165.0 m in KFM09B.*

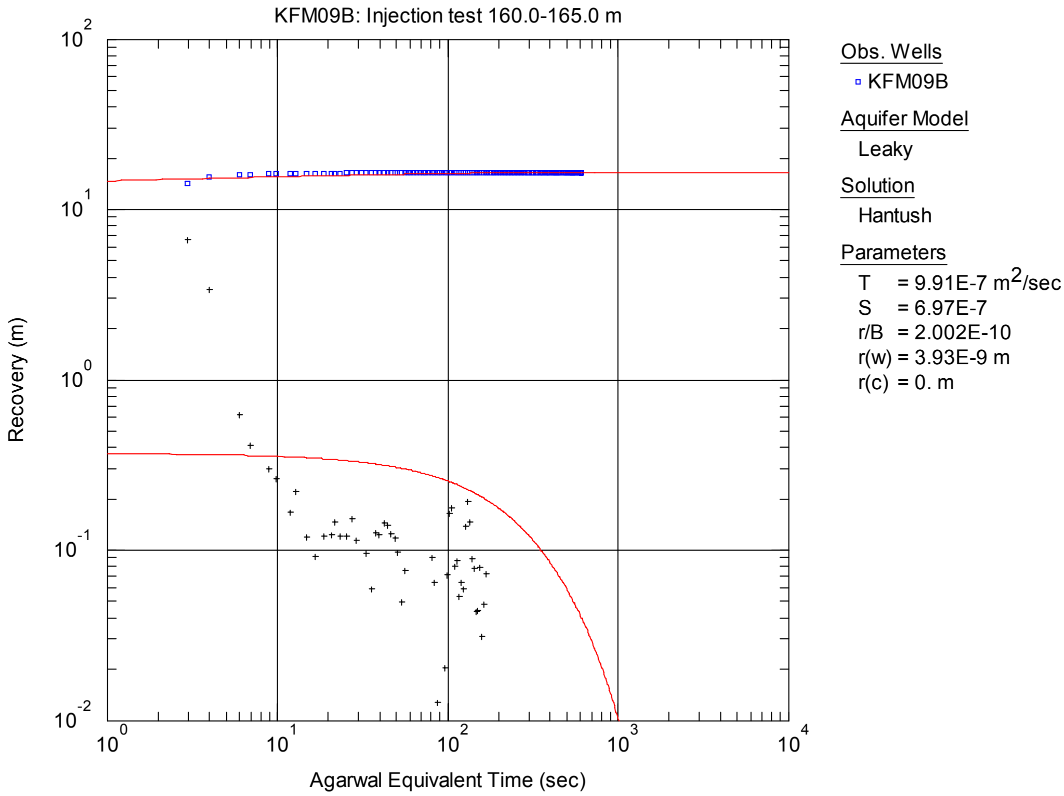


Figure A3-318. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 160.0-165.0 m in KFM09B. No unambiguous transient evaluation was possible from the recovery period. This solution is only shown for demonstrative purposes.*

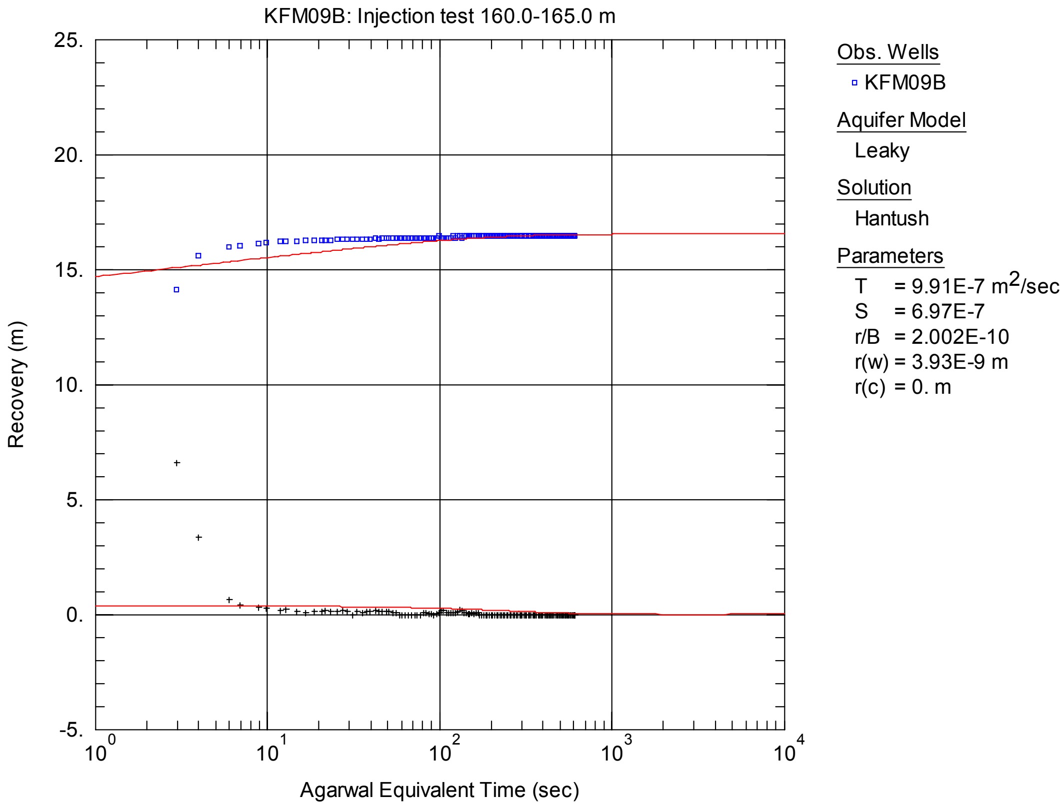


Figure A3-319. Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 160.0-165.0 m in KFM09B. No unambiguous transient evaluation was possible from the recovery period. This solution is only shown for demonstrative purposes.

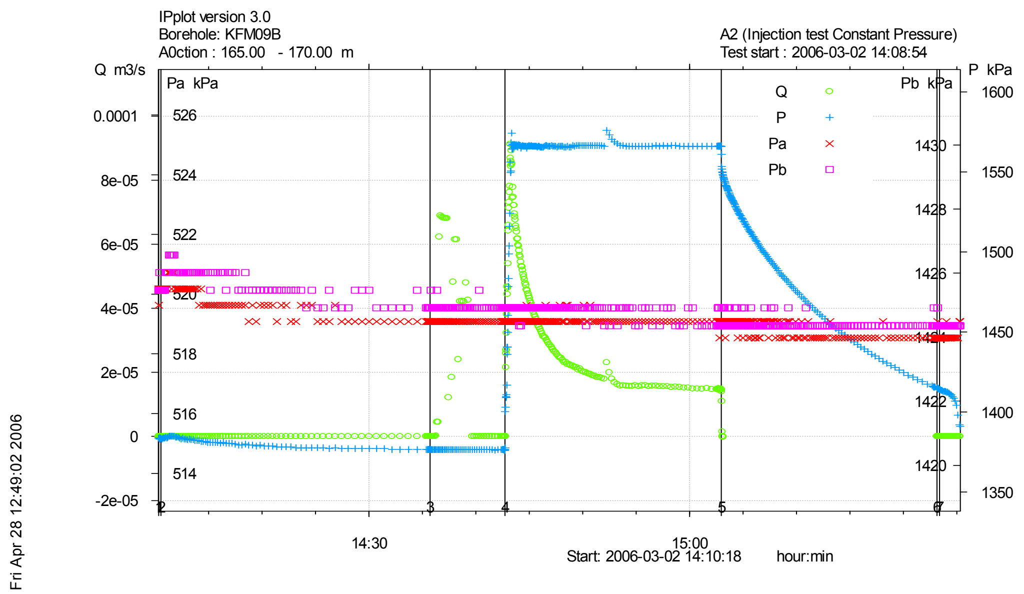


Figure A3-320. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 165.0-170.0 m in borehole KFM09B.

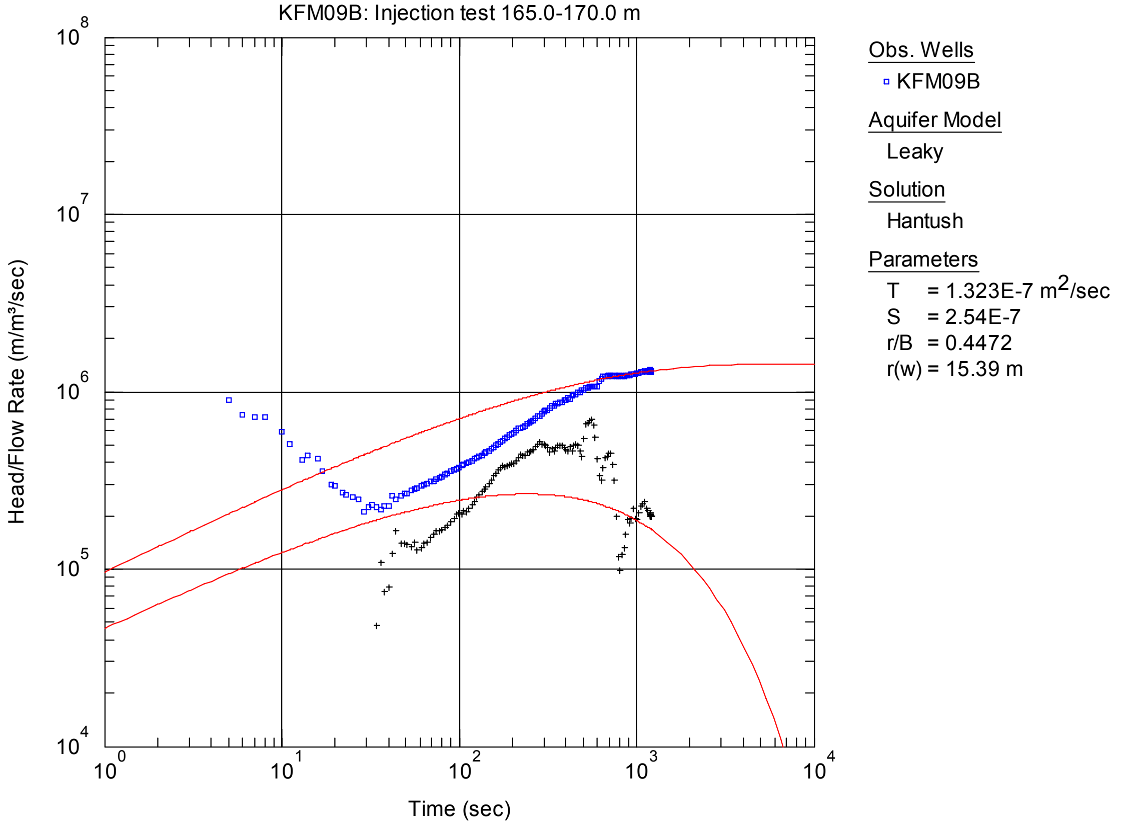


***Figure A3-321.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 165.0-170.0 m in KFM09B.*

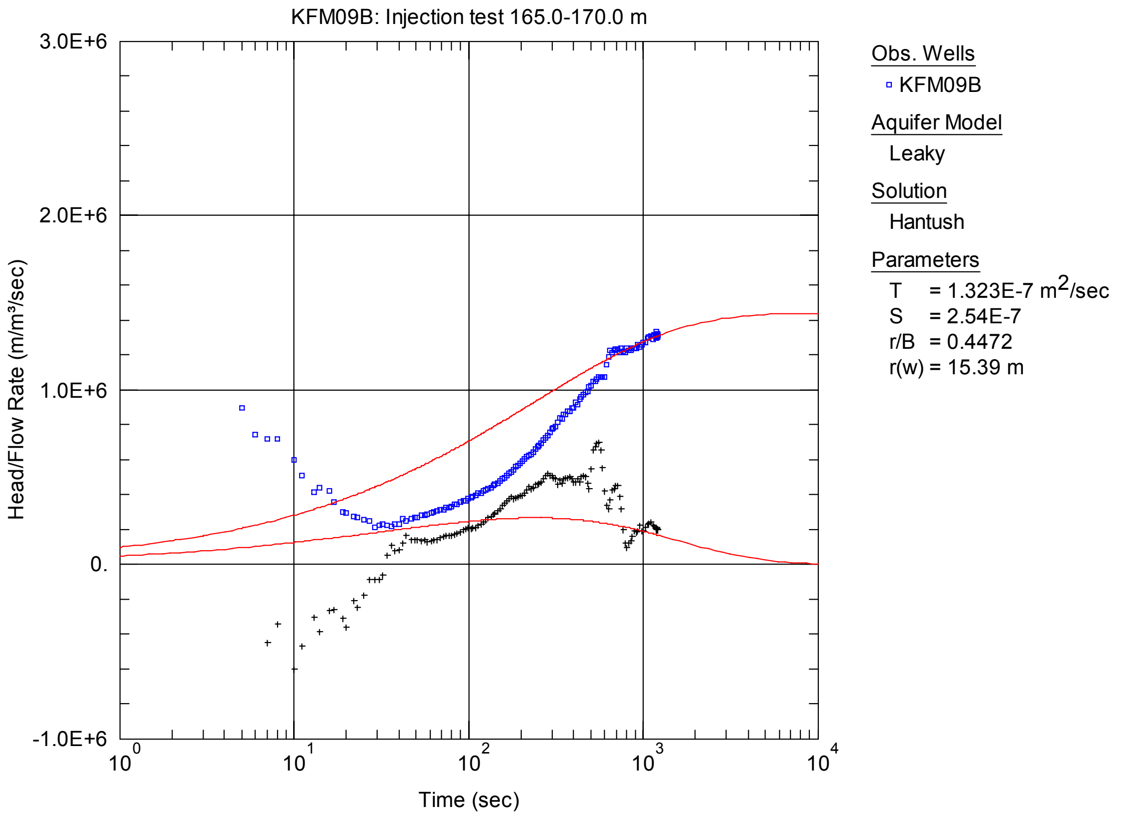


***Figure A3-322.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 165.0-170.0 m in KFM09B.*

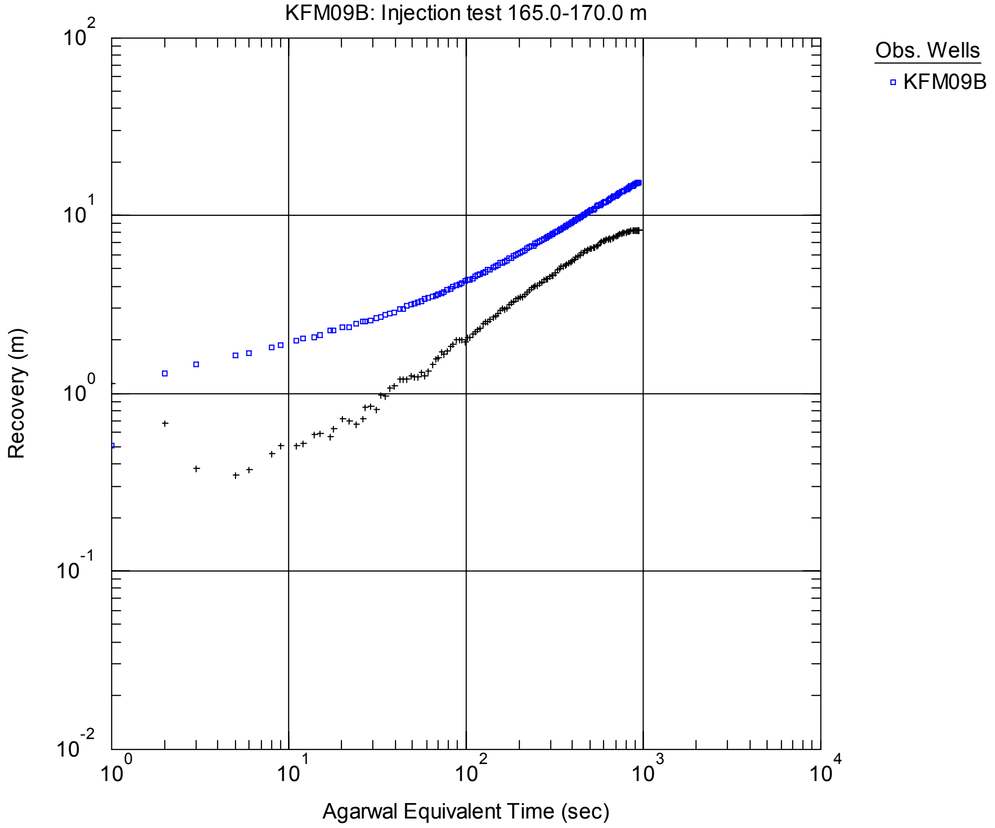


Figure A3-323. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 165.0-170.0 m in KFM09B.*

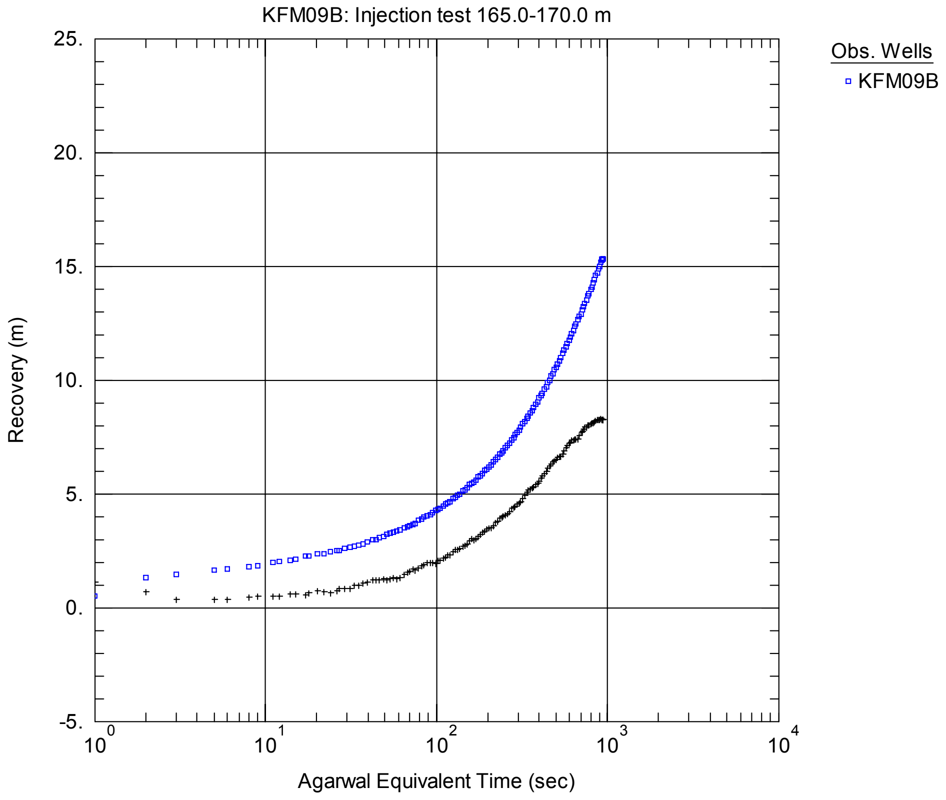


Figure A3-324. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 165.0-170.0 m in KFM09B.*

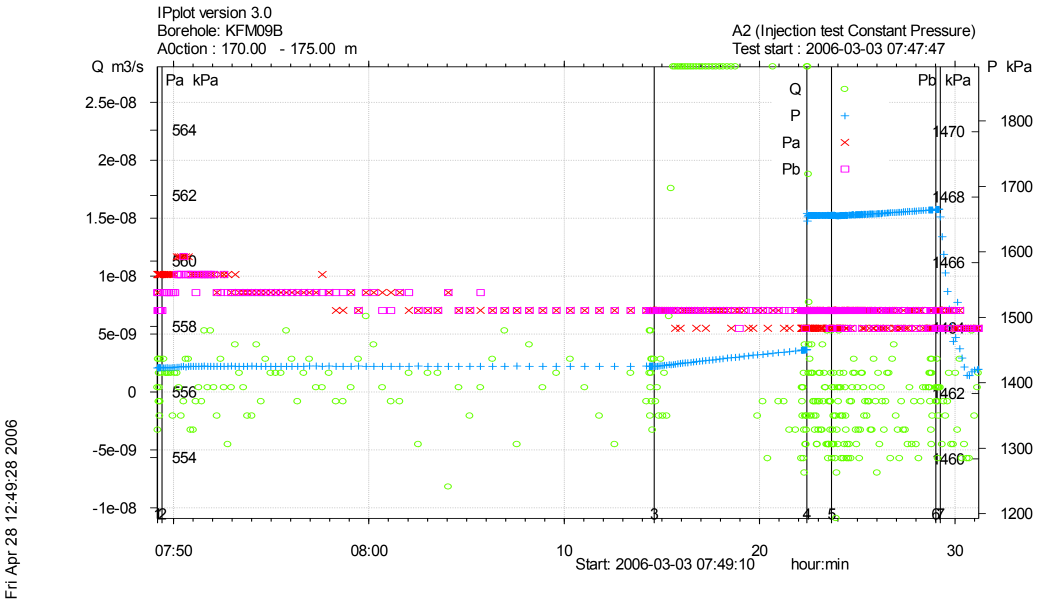


Figure A3-325. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 170.0-175.0 m in borehole KFM09B.*

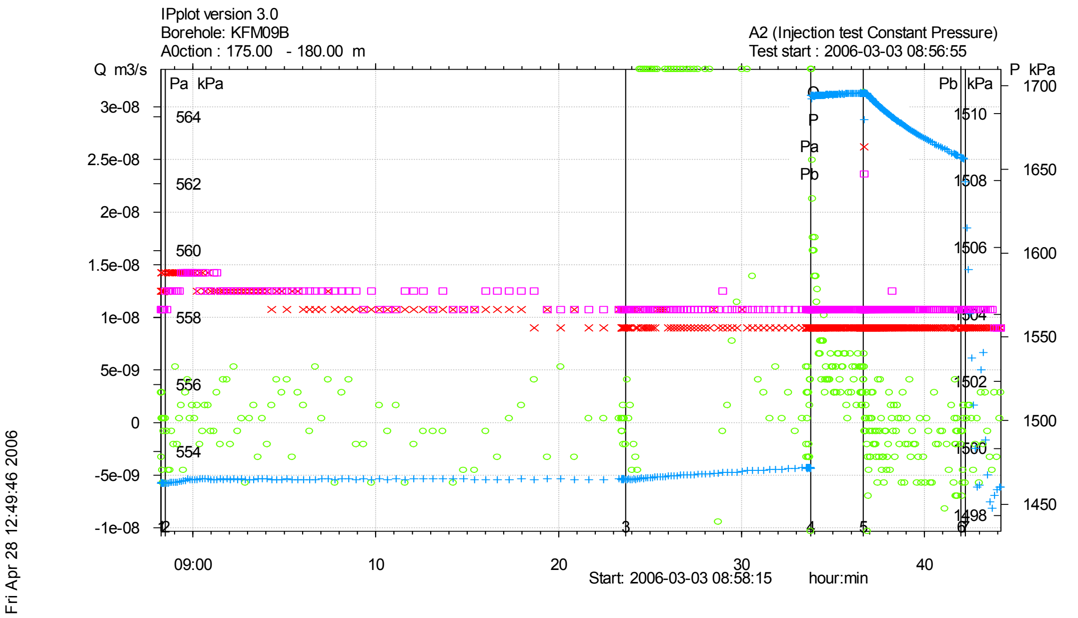


Figure A3-326. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 175.0-180.0 m in borehole KFM09B.*

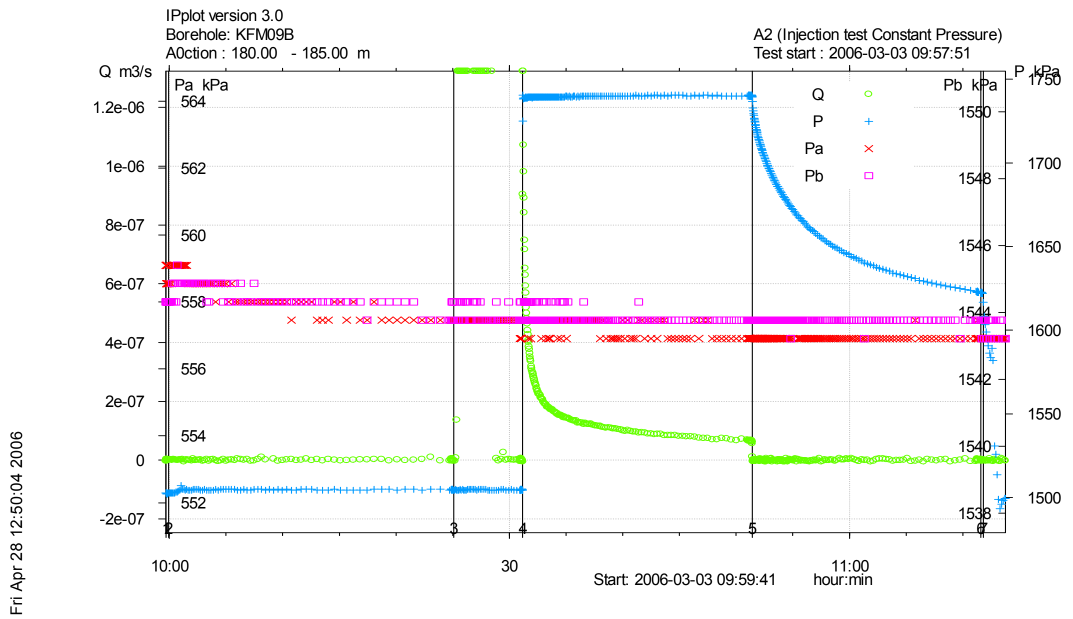


Figure A3-327. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 180.0-185.0 m in borehole KFM09B.*

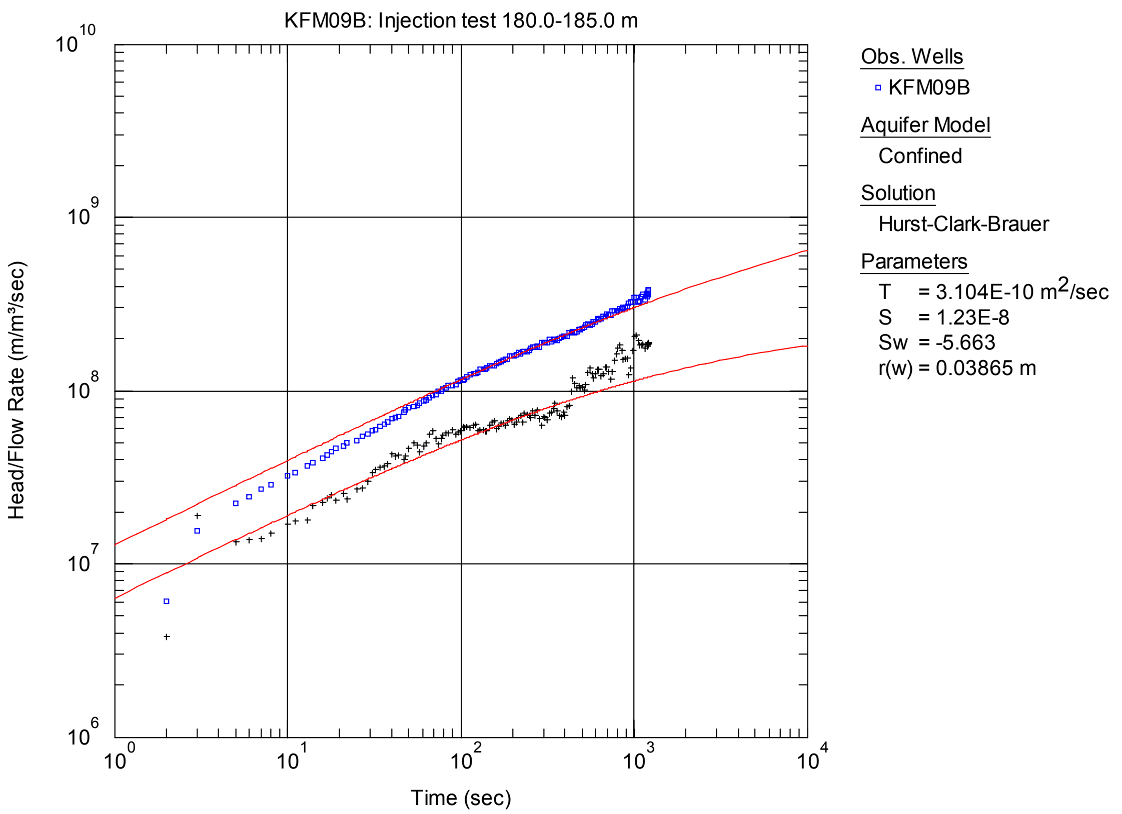


Figure A3-328. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 180.0-185.0 m in KFM09B.*

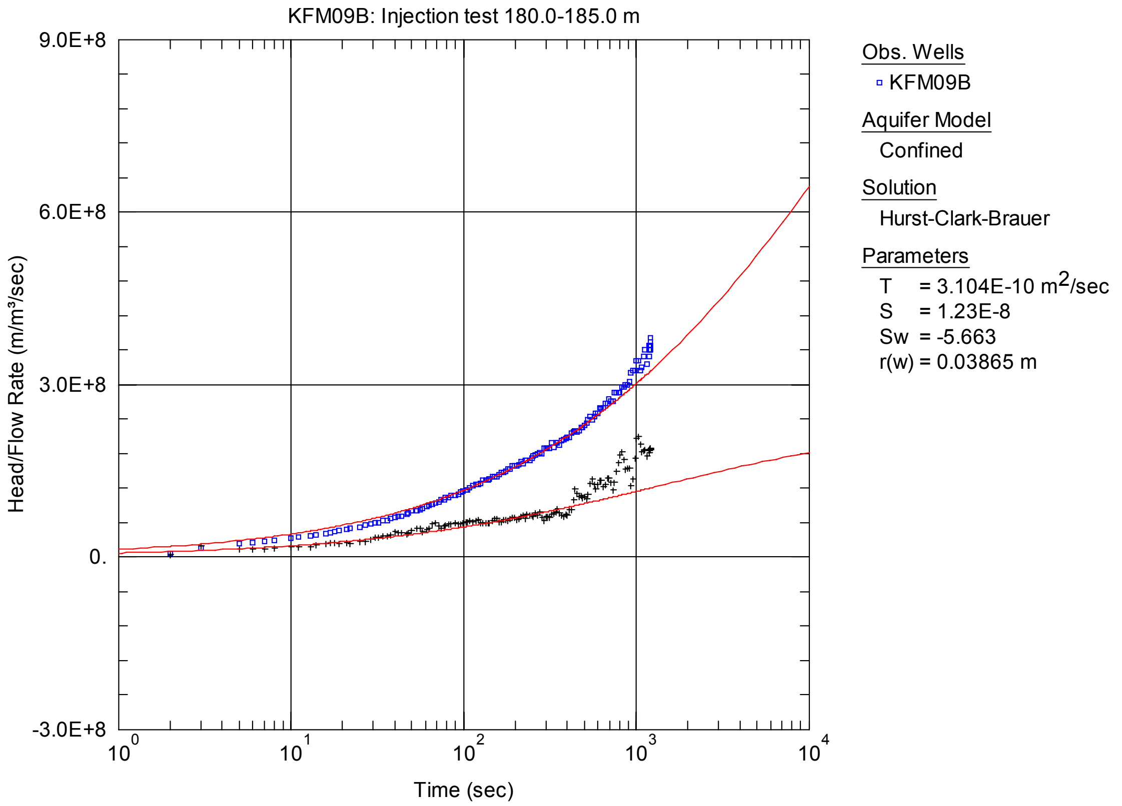


Figure A3-329. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 180.0-185.0 m in KFM09B.*

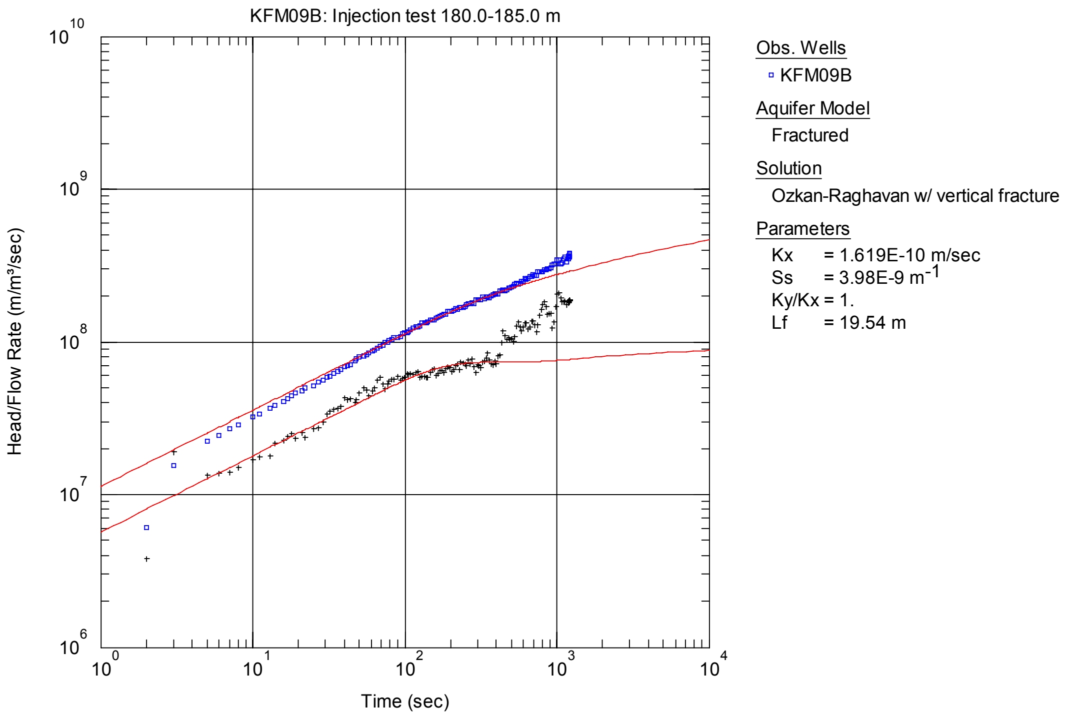


Figure A3-330. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 180.0-185.0 m in KFM09B.*

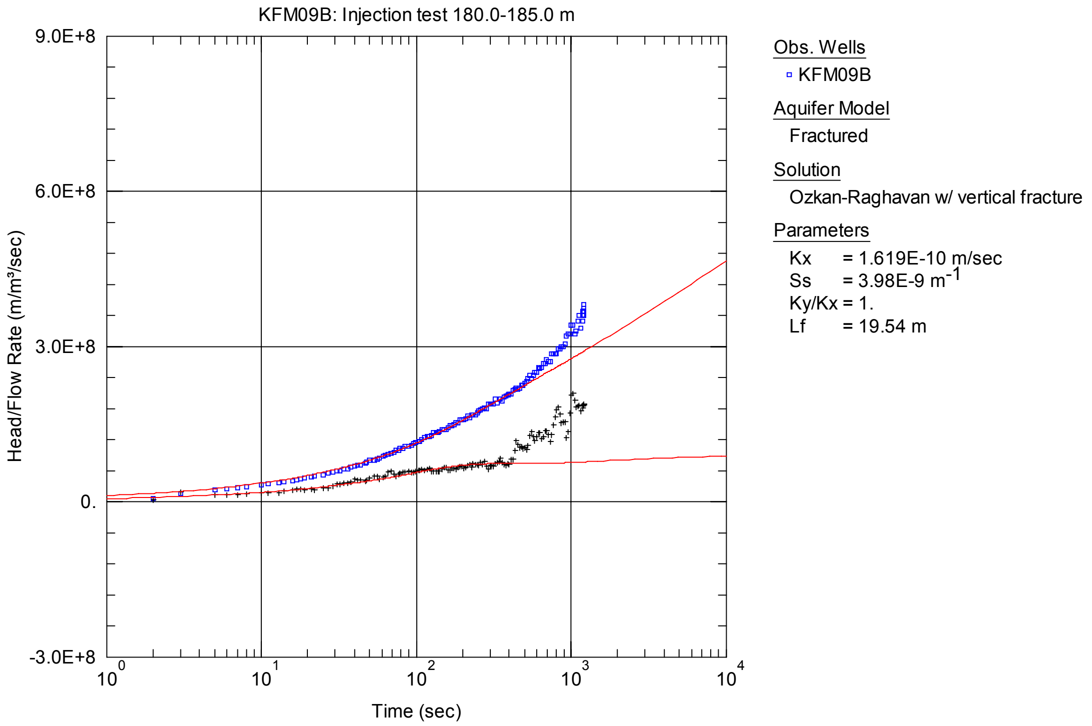


Figure A3-331. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 180.0-185.0 m in KFM09B.*

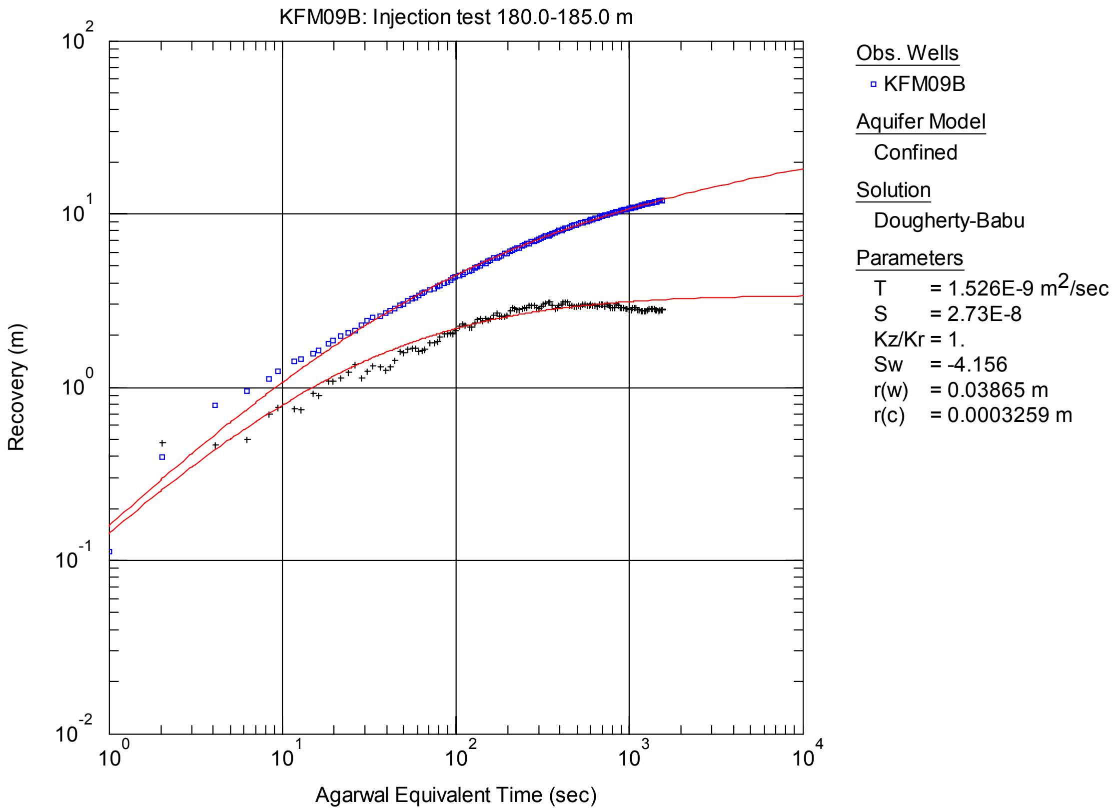


Figure A3-332. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 180.0-185.0 m in KFM09B.*

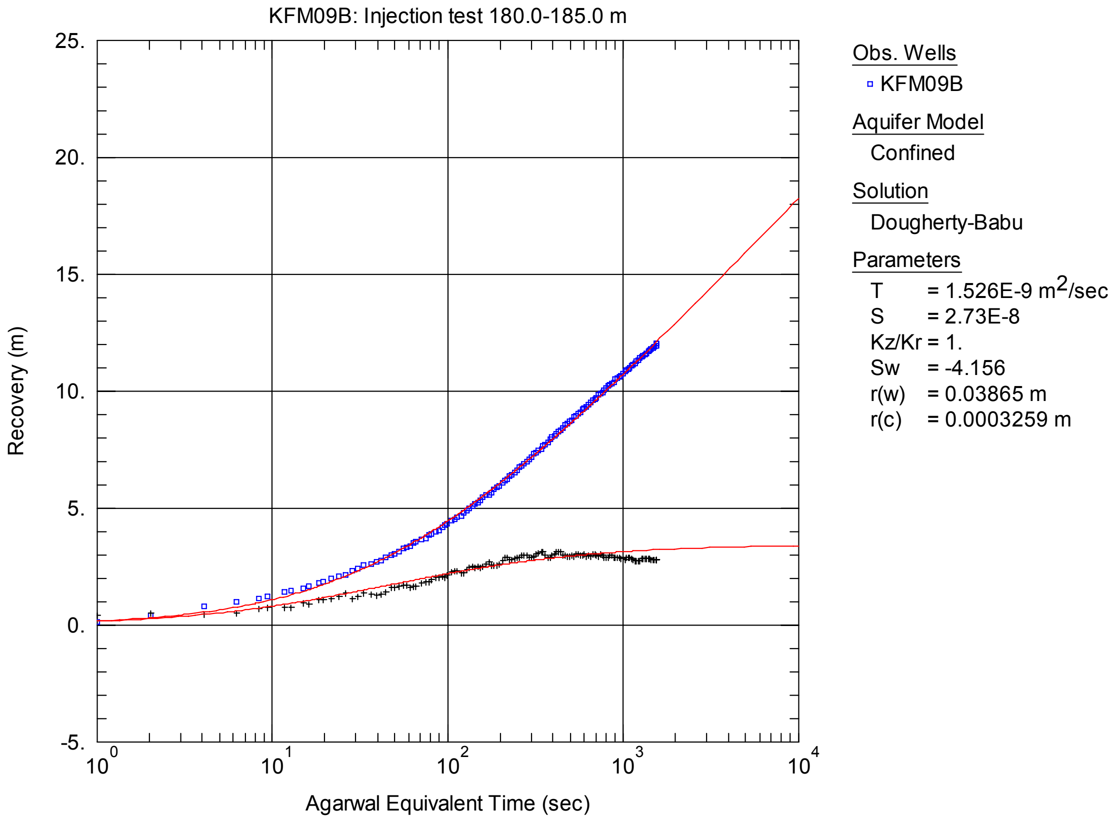


Figure A3-333. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 180.0-185.0 m in KFM09B.*

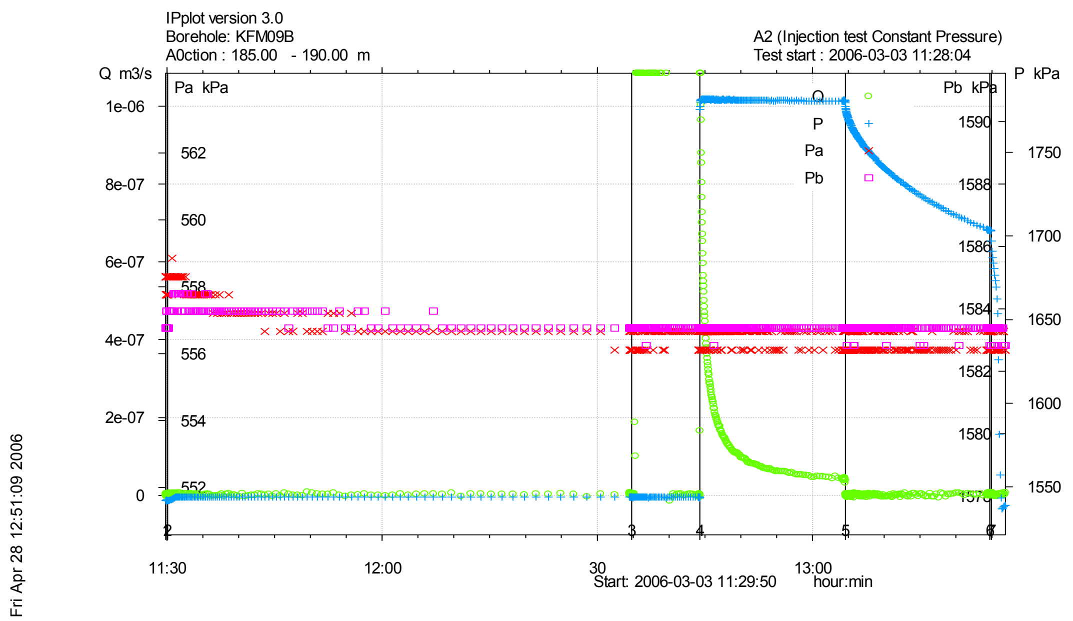


Figure A3-334. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 185.0-190.0 m in borehole KFM09B.*

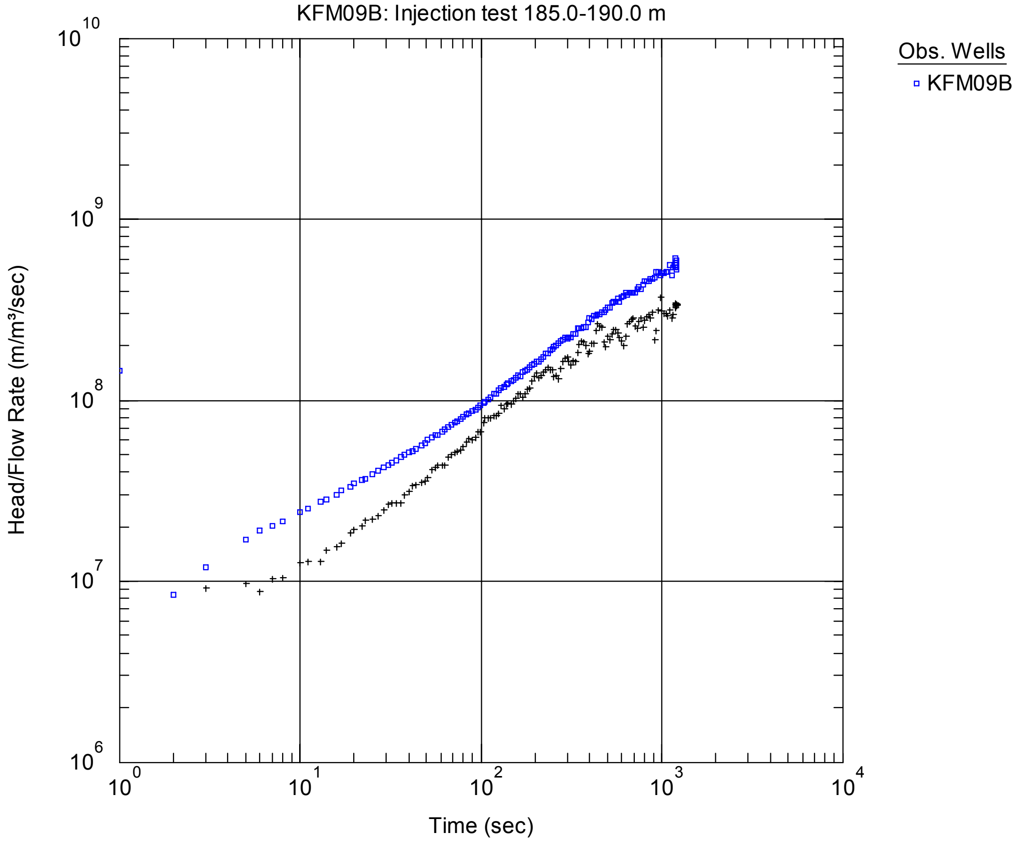


Figure A3-335. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 185.0-190.0 m in KFM09B.*

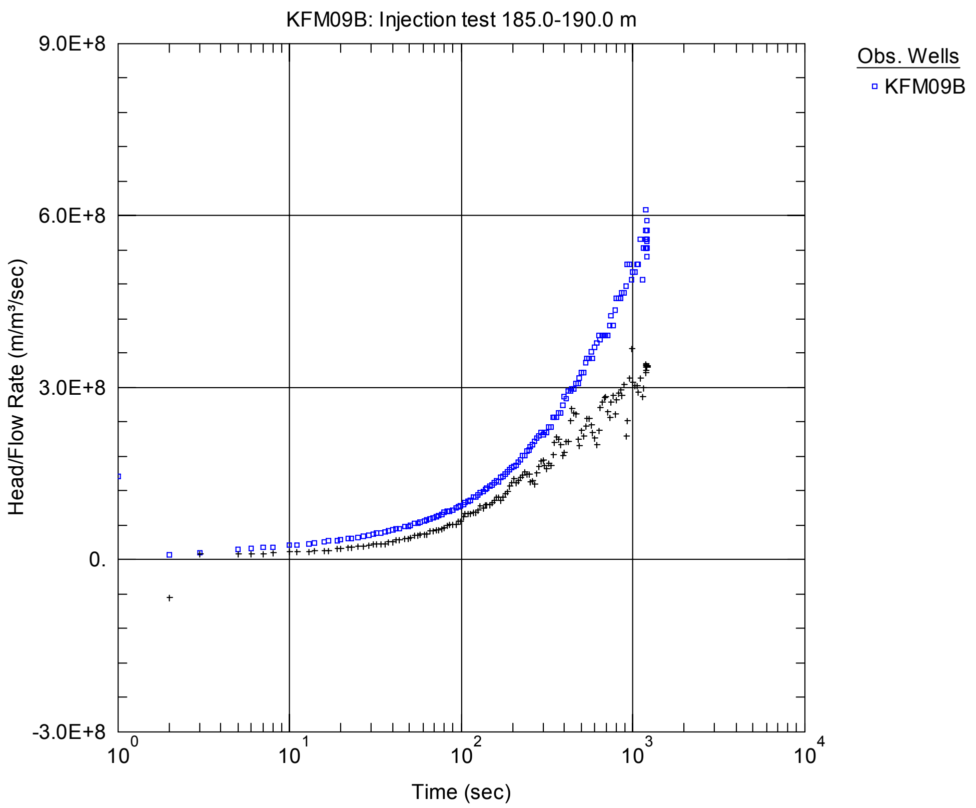


Figure A3-336. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 185.0-190.0 m in KFM09B.*

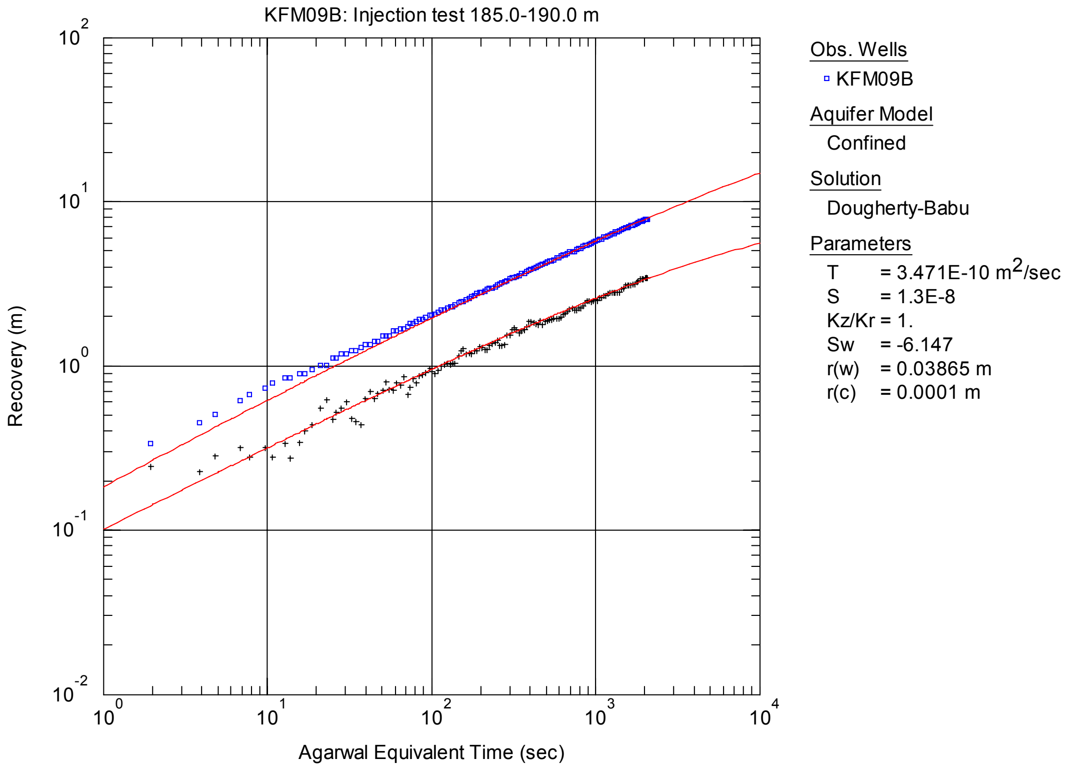


Figure A3-337. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Dougherty-Babu solution, from the injection test in section 185.0-190.0 m in KFM09B.*

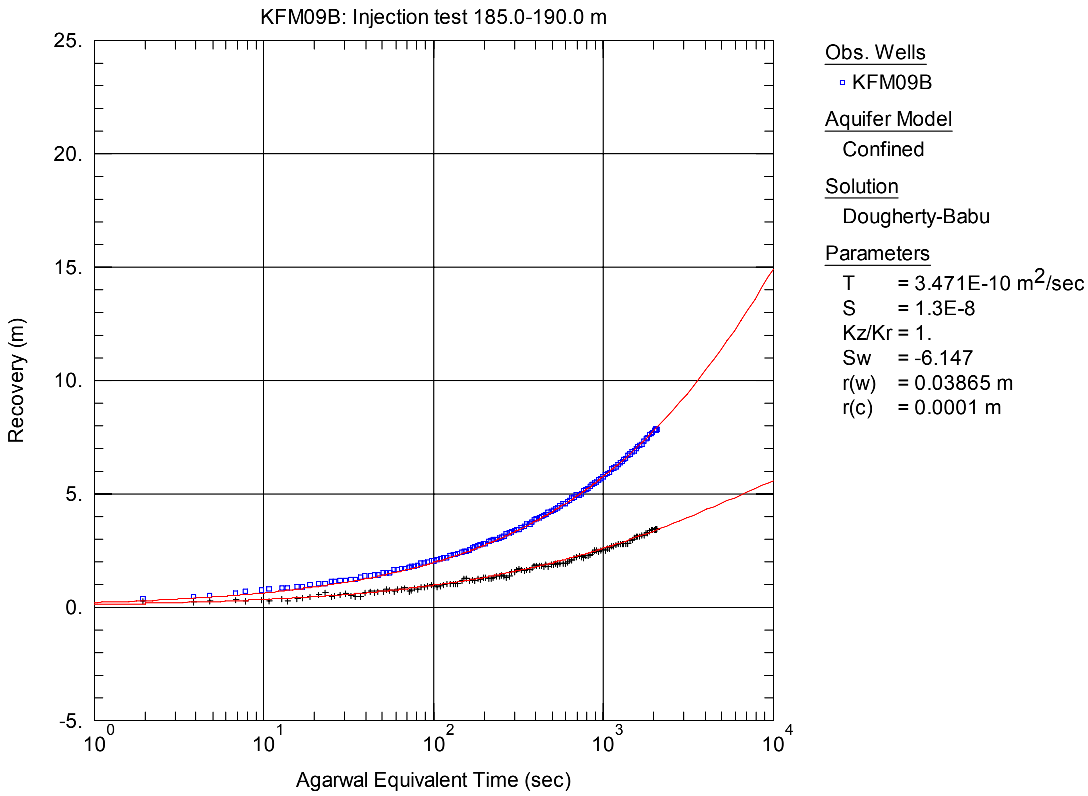


Figure A3-338. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Dougherty-Babu solution, from the injection test in section 185.0-190.0 m in KFM09B.*

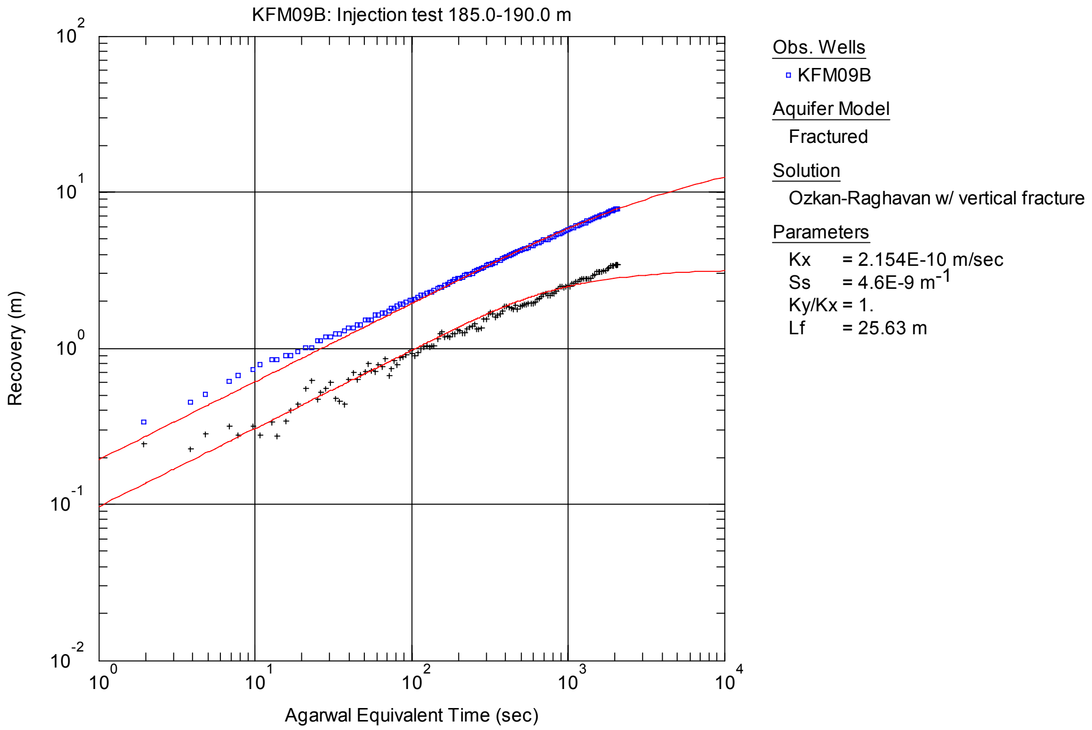


***Figure A3-339.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 185.0-190.0 m in KFM09B.*

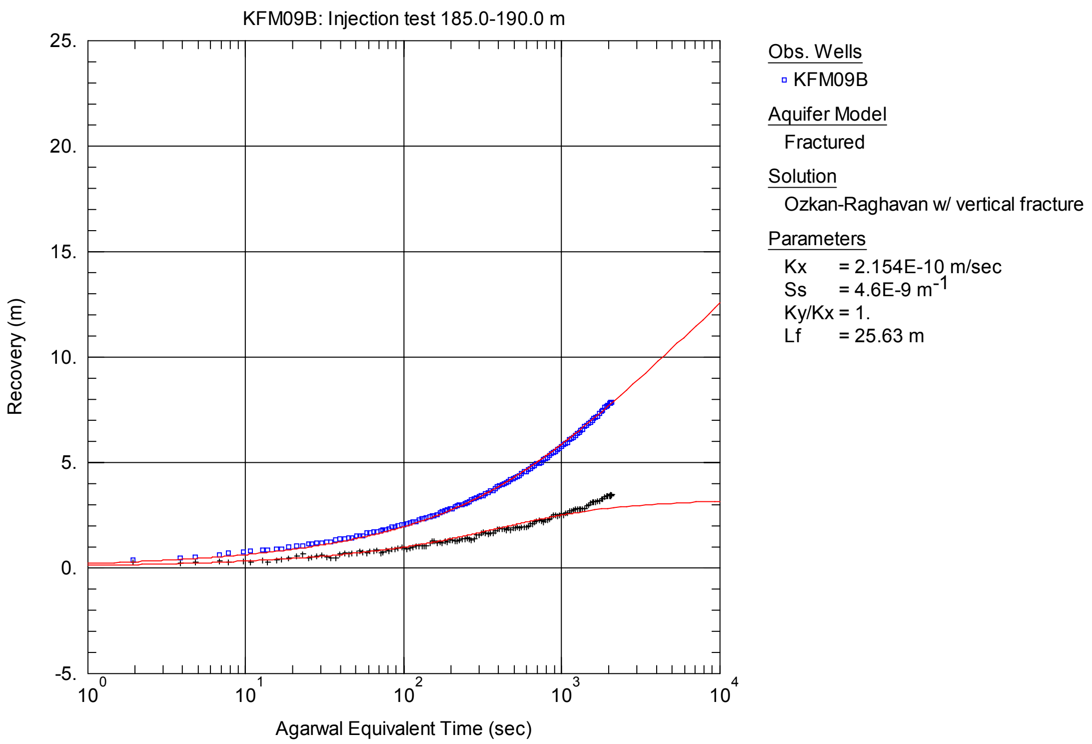


***Figure A3-340.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 185.0-190.0 m in KFM09B.*

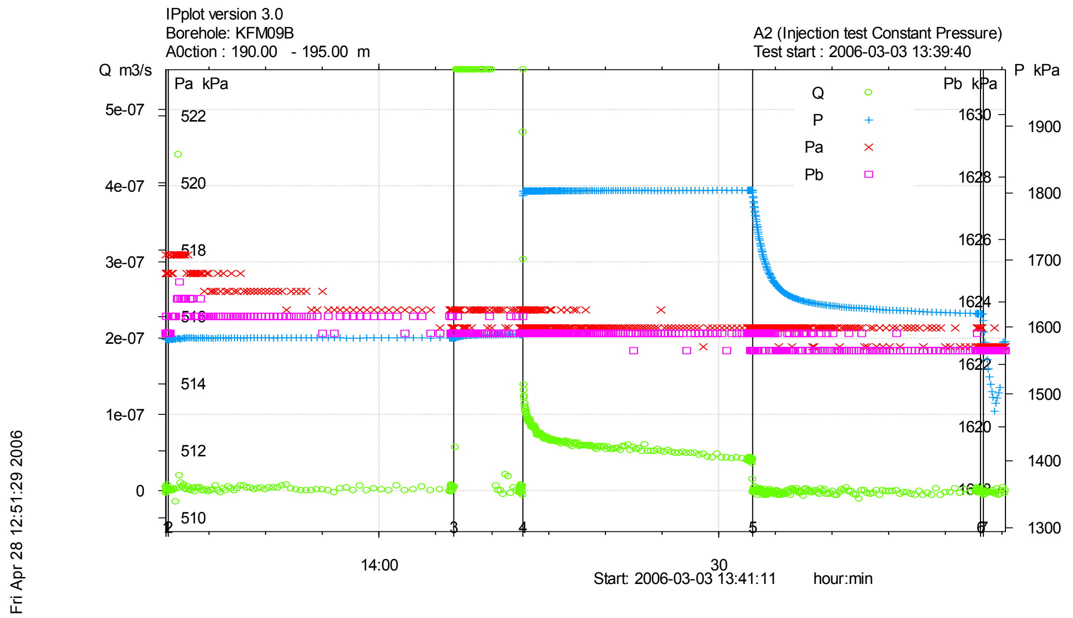


***Figure A3-341.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 190.0-195.0 m in borehole KFM09B.*

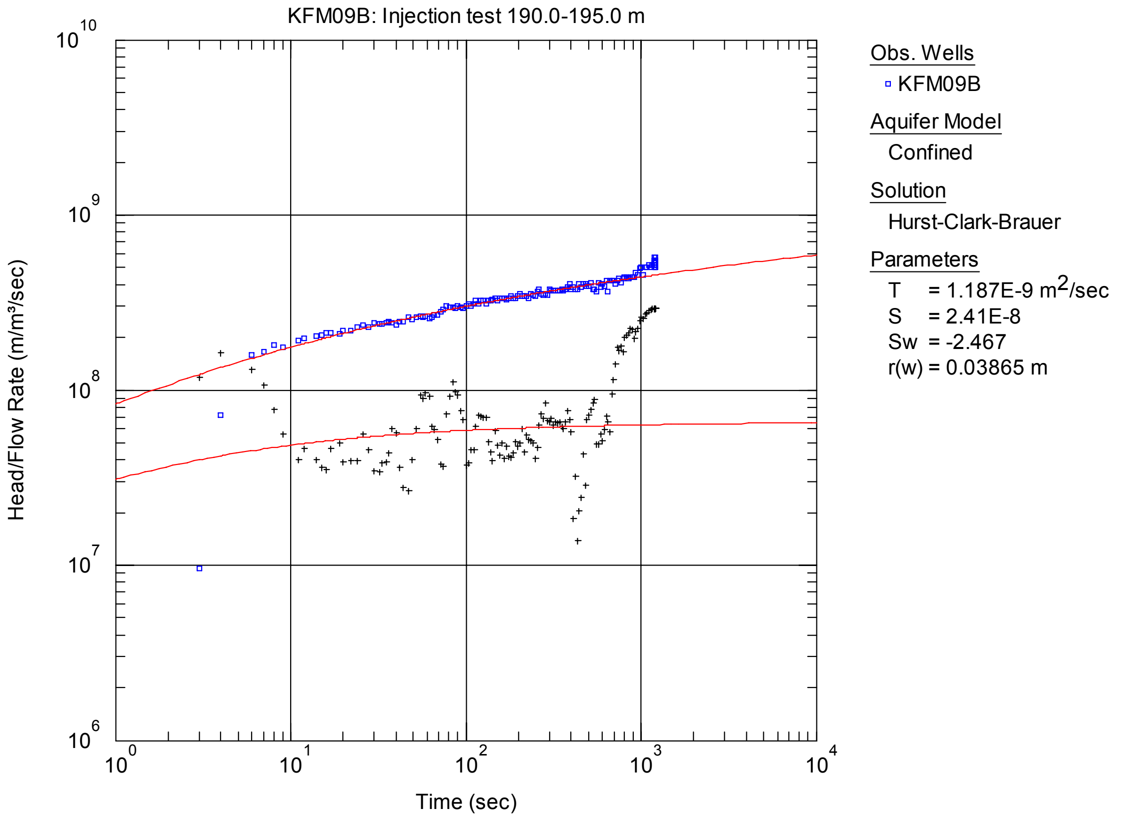


***Figure A3-342.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 190.0-195.0 m in KFM09B.*

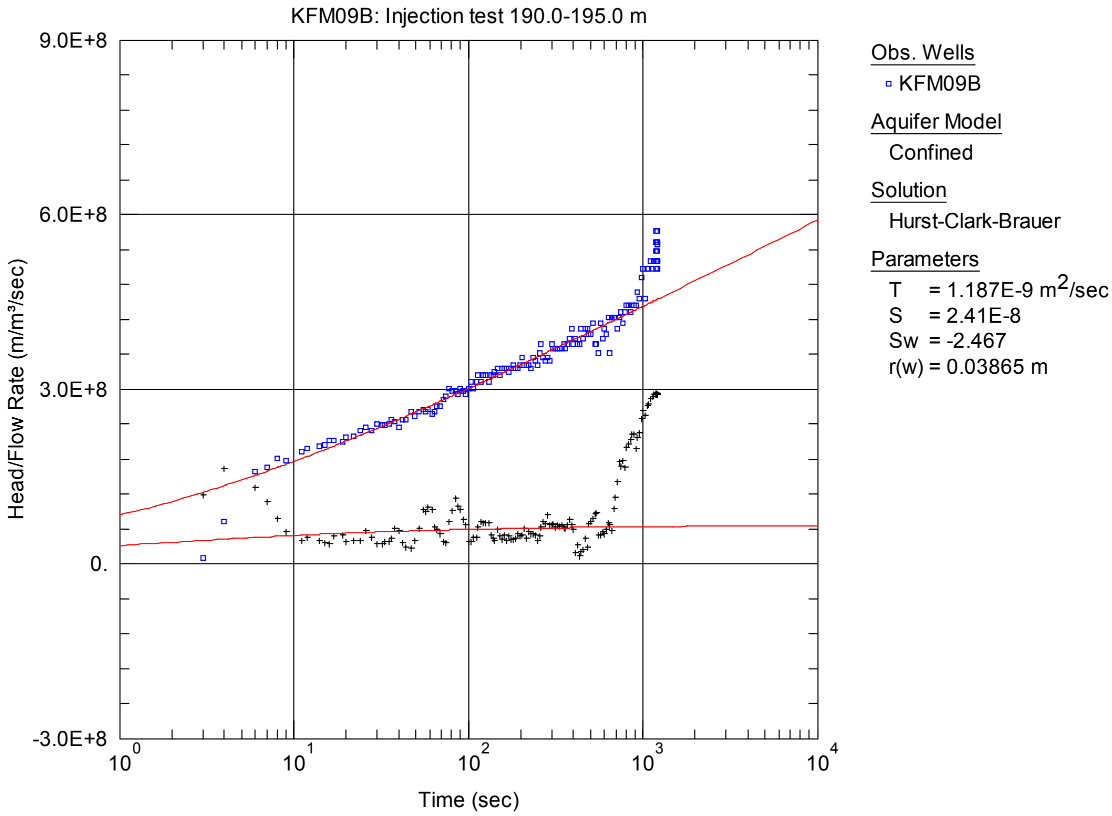


Figure A3-343. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 190.0-195.0 m in KFM09B.*

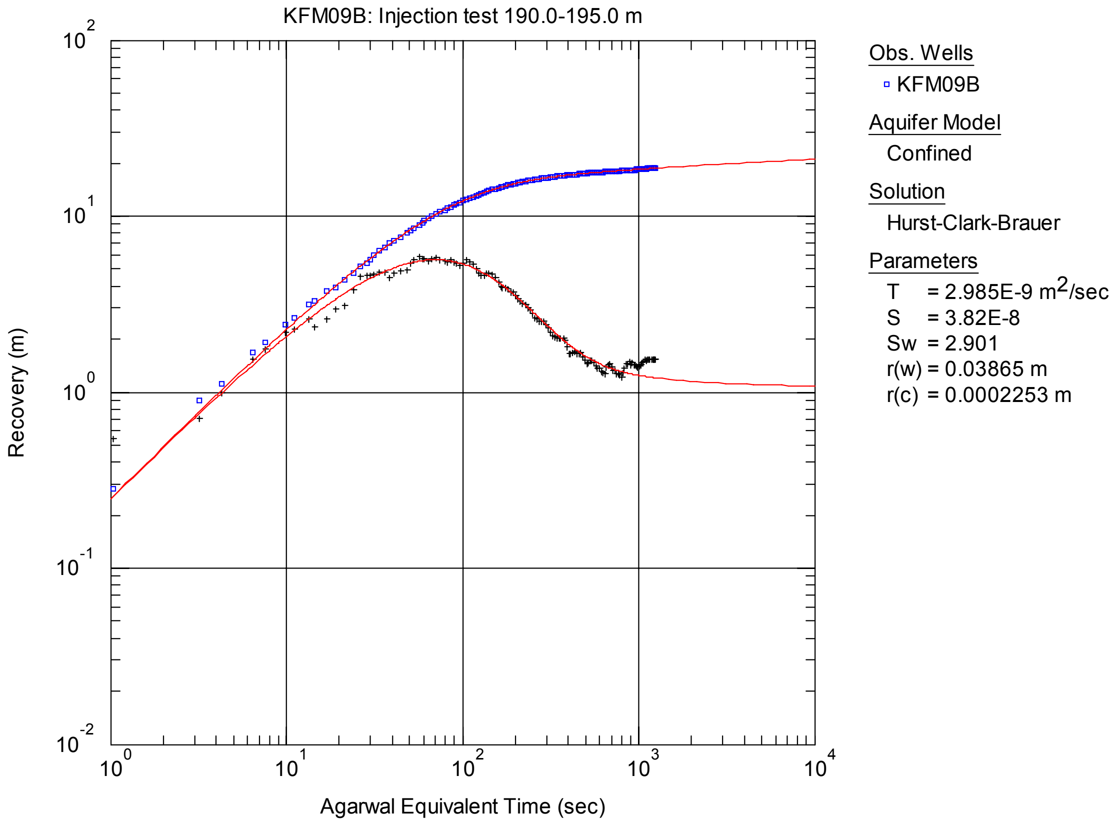


Figure A3-344. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 190.0-195.0 m in KFM09B.*

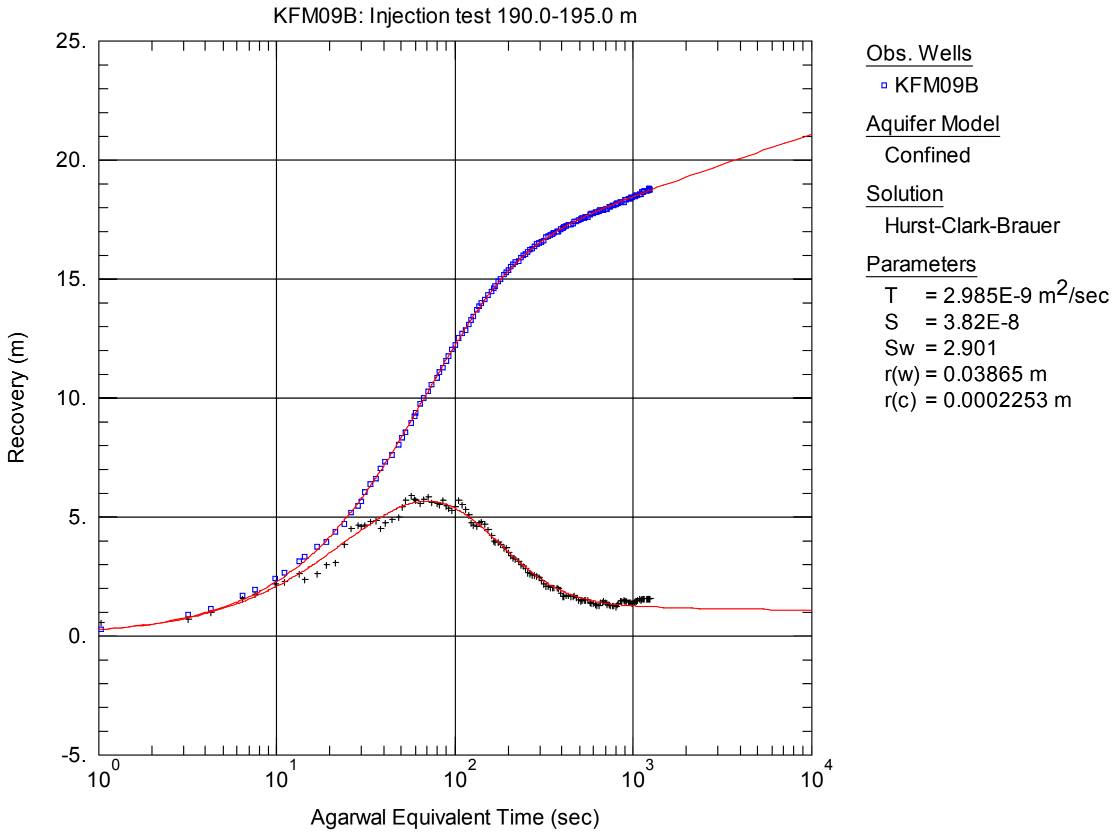


Figure A3-345. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 190.0-195.0 m in KFM09B.*

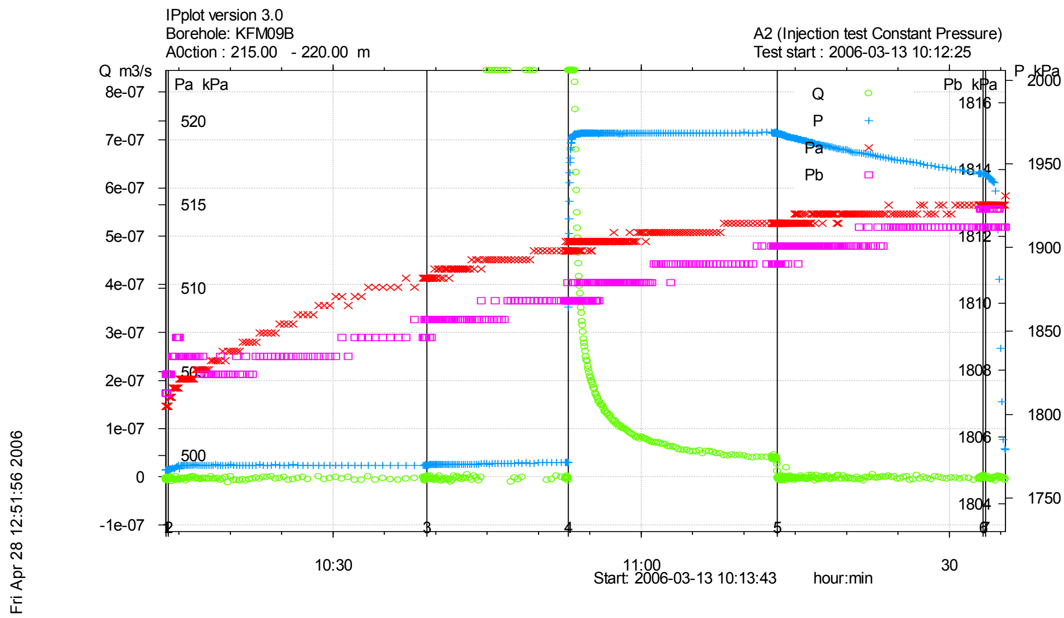


Figure A3-346. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 215.0-220.0 m in borehole KFM09B.*

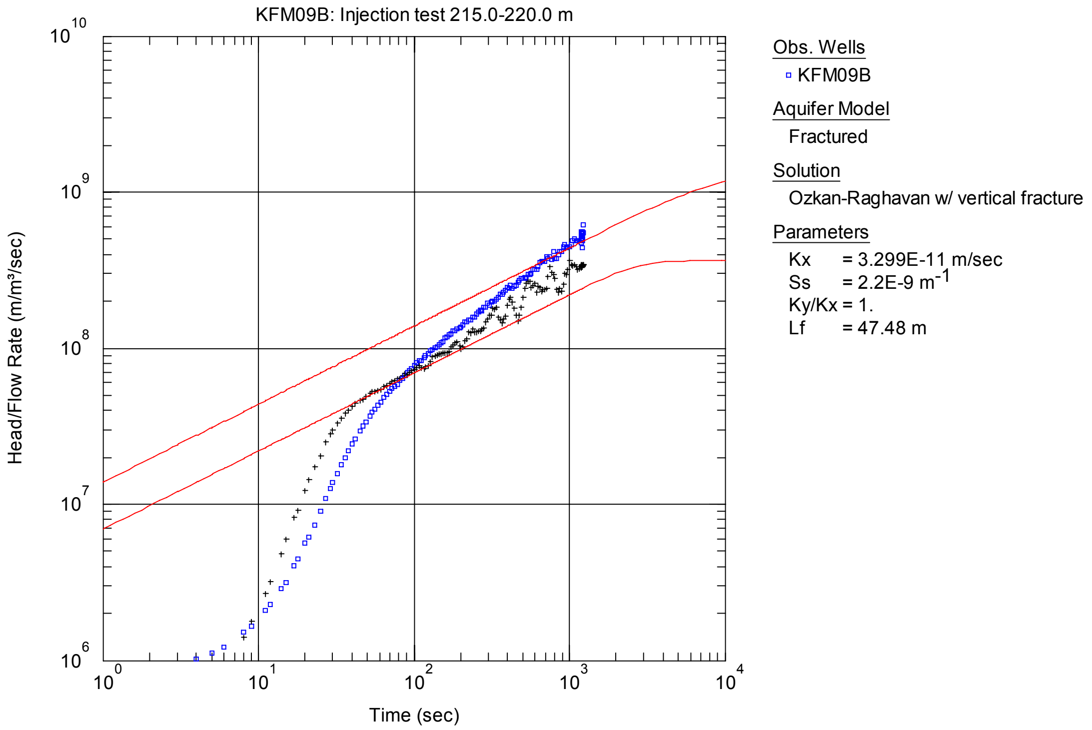


Figure A3-347. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 215.0-220.0 m in KFM09B. No unambiguous transient evaluation was possible. This solution is only shown for demonstrative purposes, mainly to display that the section is of low transmissivity.*

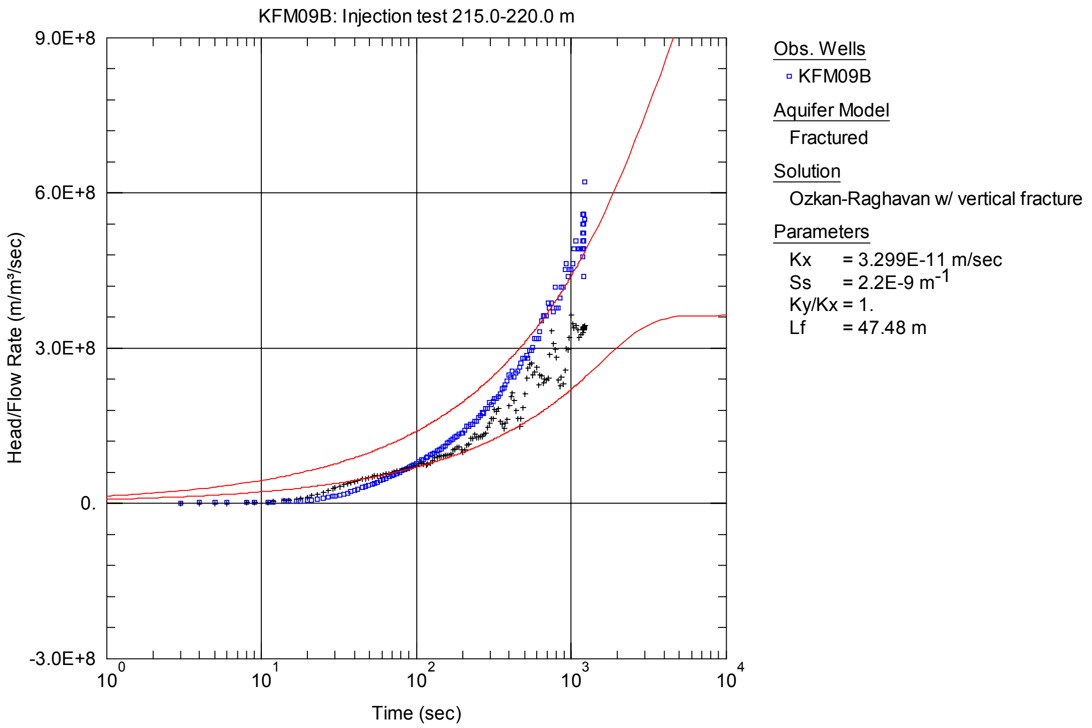


Figure A3-348. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 215.0-220.0 m in KFM09B. No unambiguous transient evaluation was possible. This solution is only shown for demonstrative purposes, mainly to display that the section is of low transmissivity.*

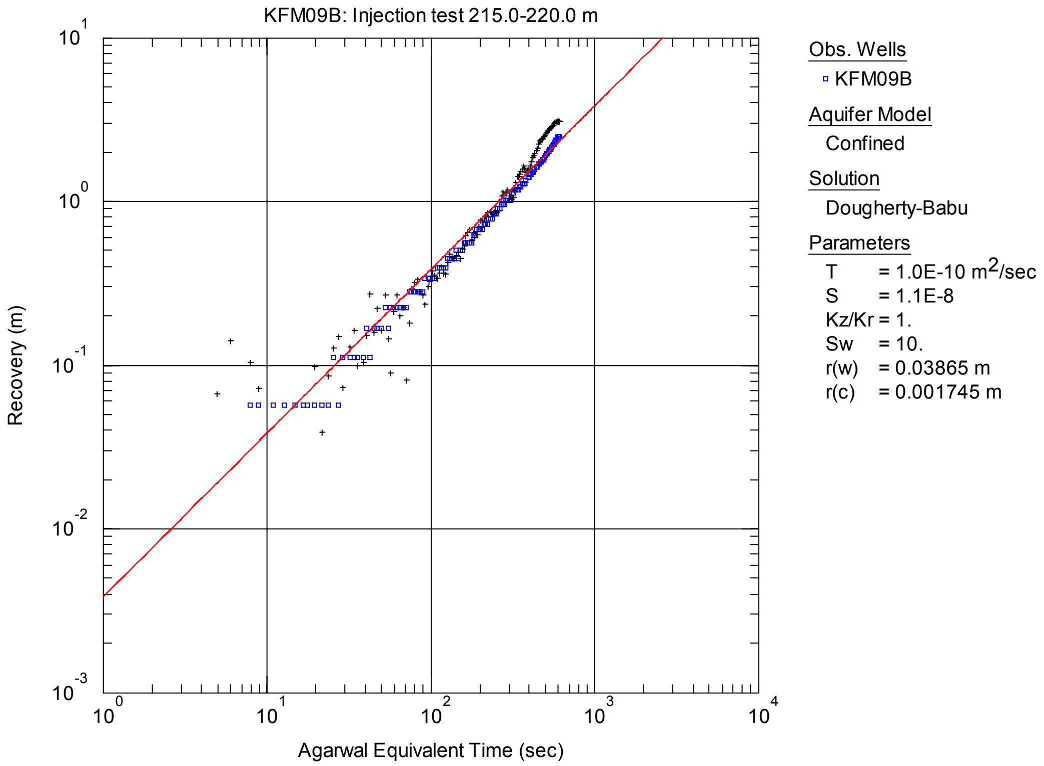


Figure A3-349. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 215.0-220.0 m in KFM09B. No unambiguous transient evaluation was possible. This solution is only shown for demonstrative purposes, mainly to display that the section is of low transmissivity.*

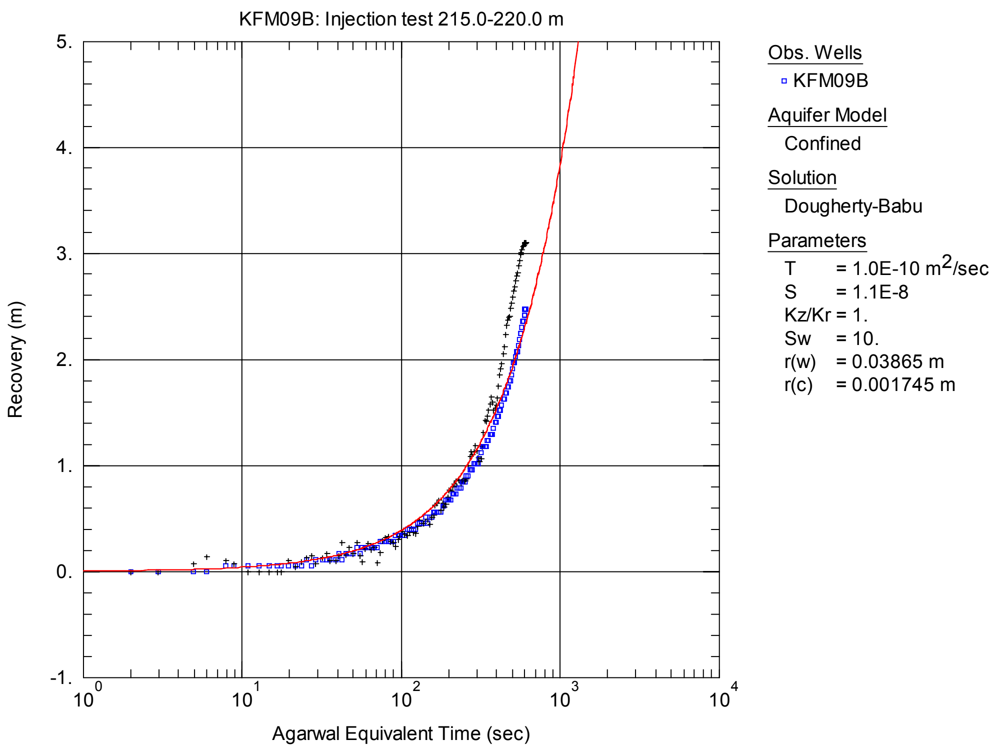


Figure A3-350. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 215.0-220.0 m in KFM09B. No unambiguous transient evaluation was possible. This solution is only shown for demonstrative purposes, mainly to display that the section is of low transmissivity.*

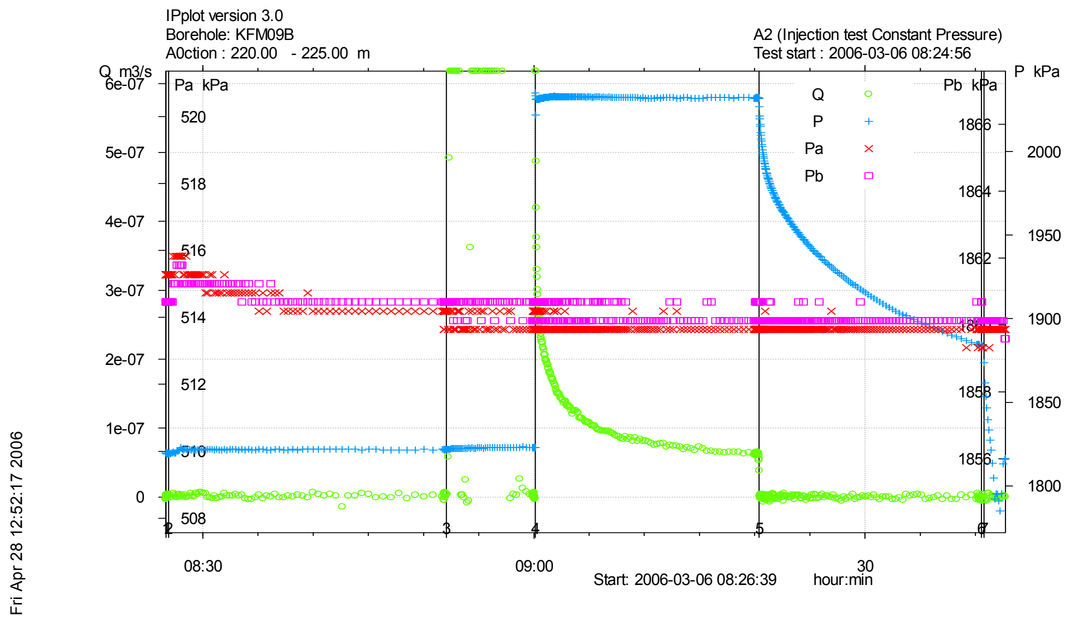


Figure A3-351. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 220.0-225.0 m in borehole KFM09B.*

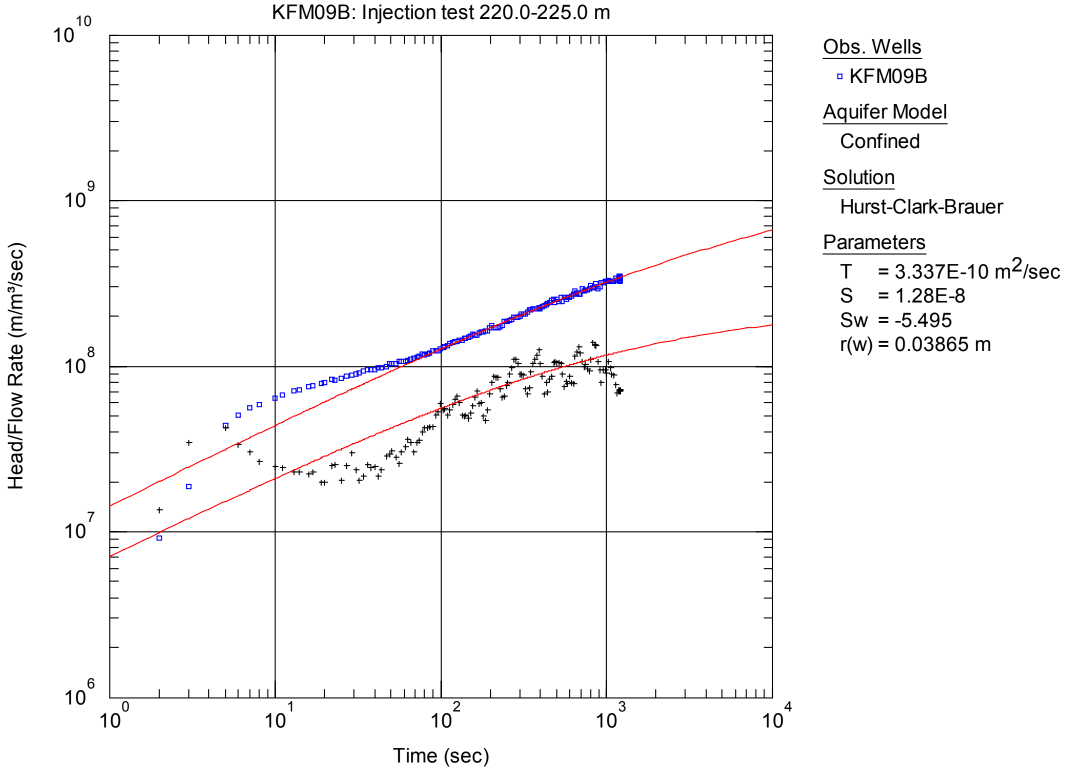


Figure A3-352. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 220.0-225.0 m in KFM09B.*

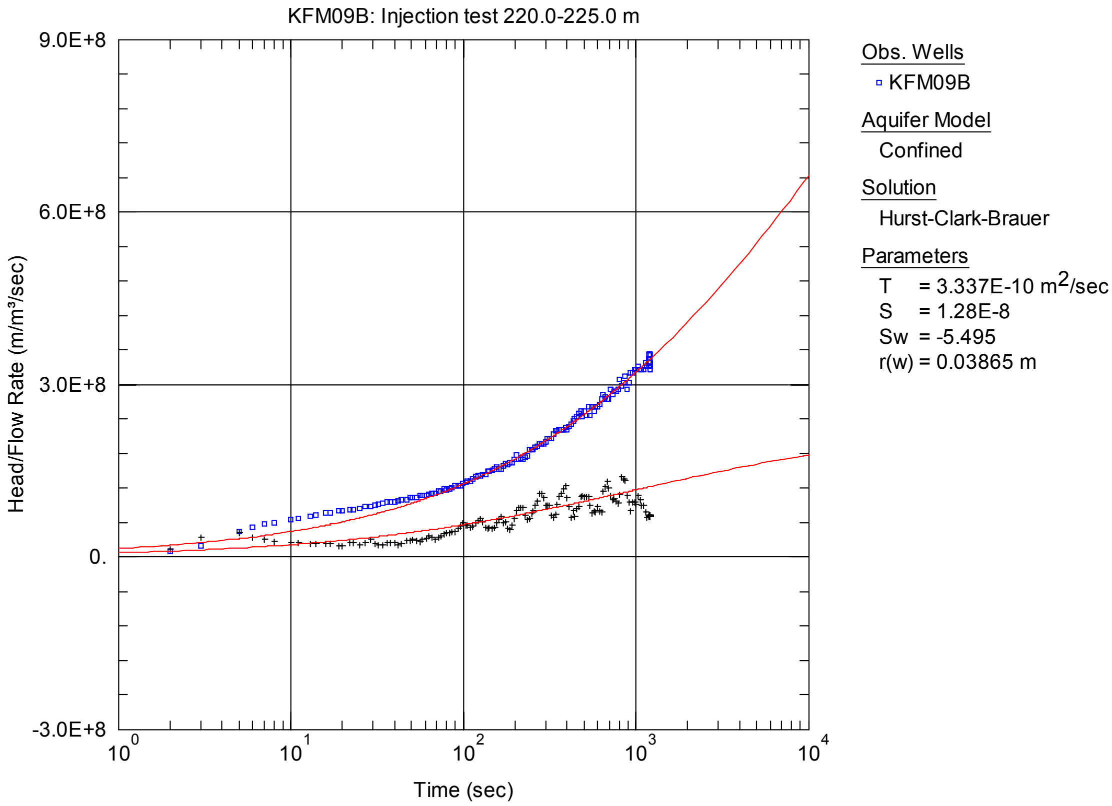


Figure A3-353. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 220.0-225.0 m in KFM09B.*

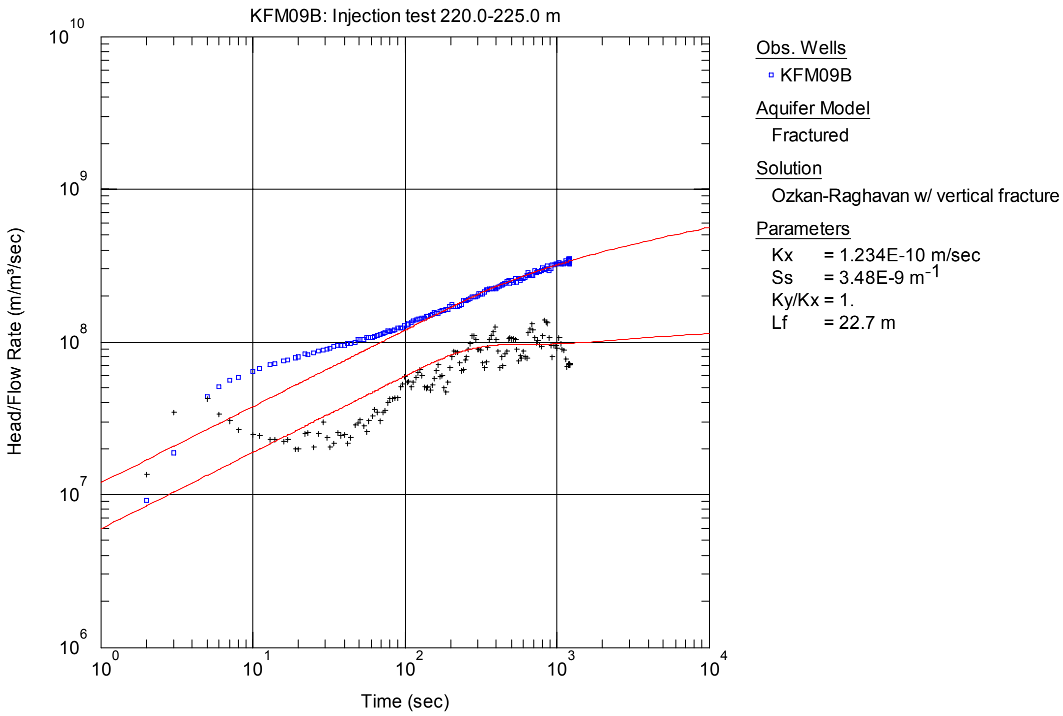


Figure A3-354. *Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 220.0-225.0 m in KFM09B.*

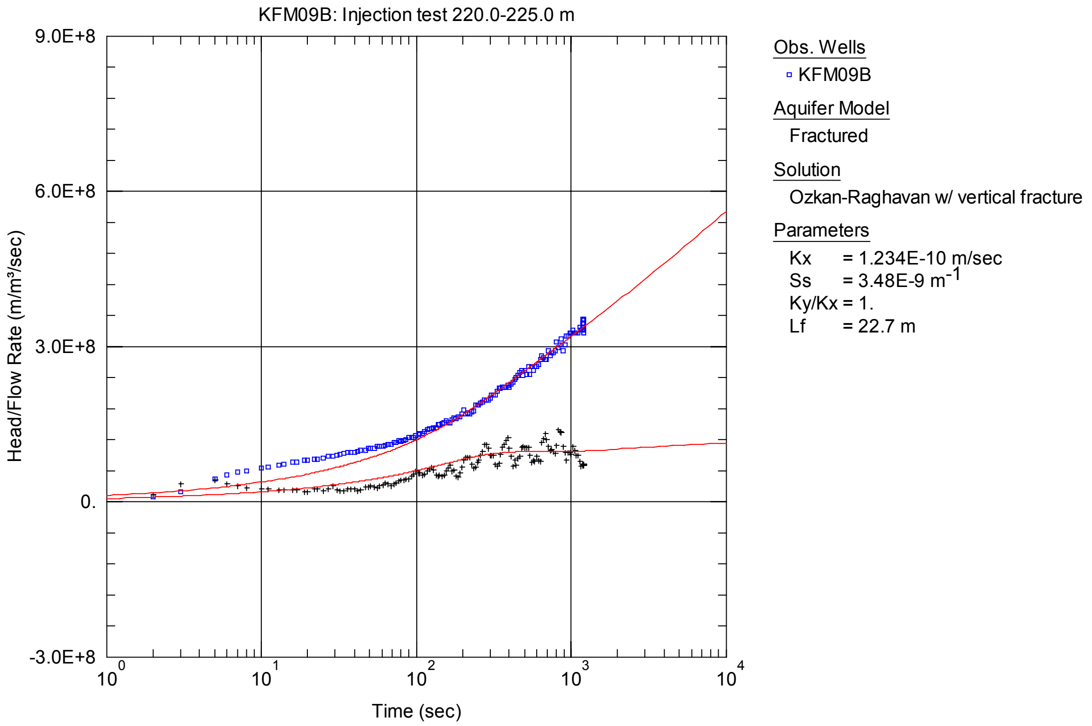


Figure A3-355. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 220.0-225.0 m in KFM09B.*

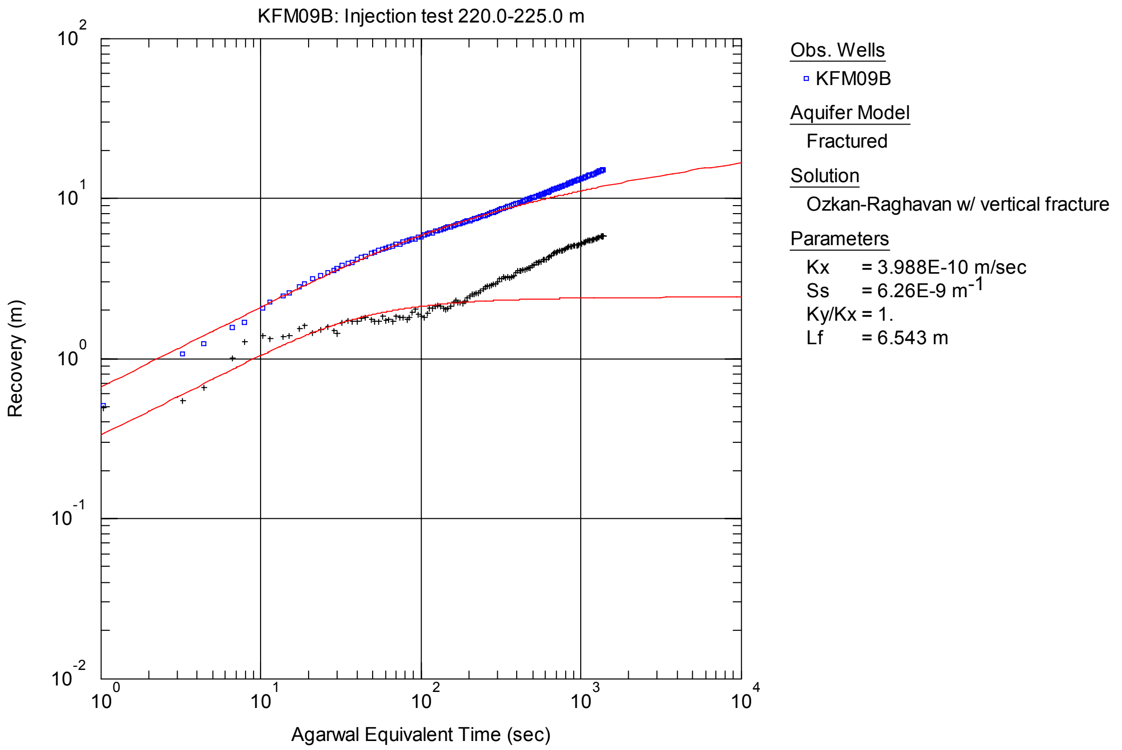


Figure A3-356. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 220.0-225.0 m in KFM09B.*

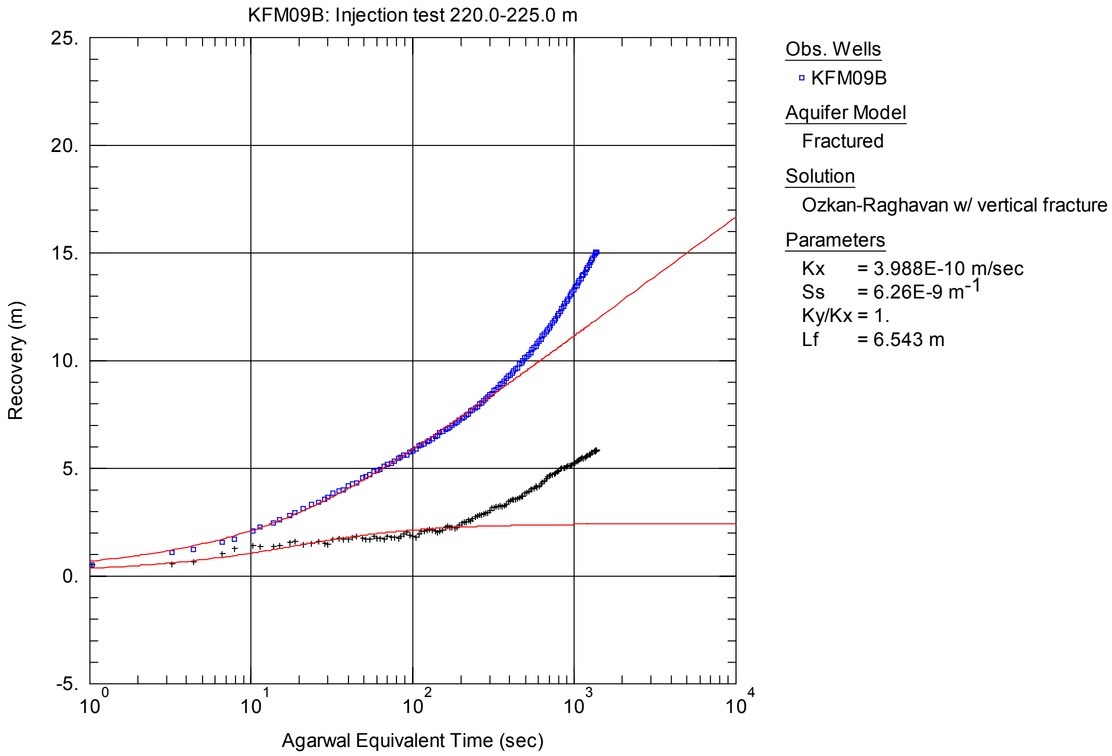


Figure A3-357. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 220.0-225.0 m in KFM09B.*

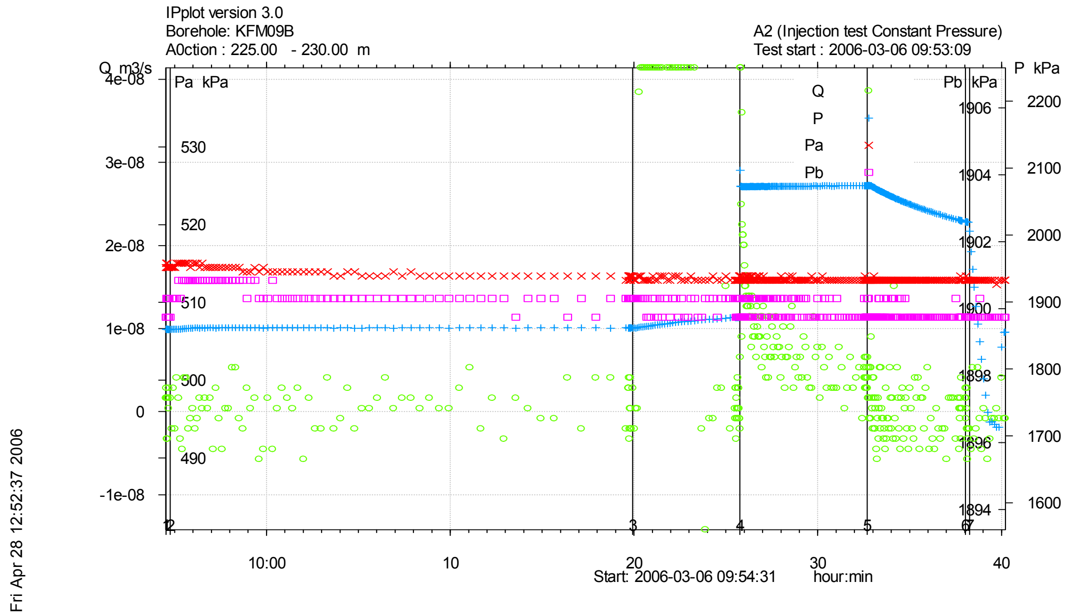


Figure A3-358. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 225.0-230.0 m in borehole KFM09B.*

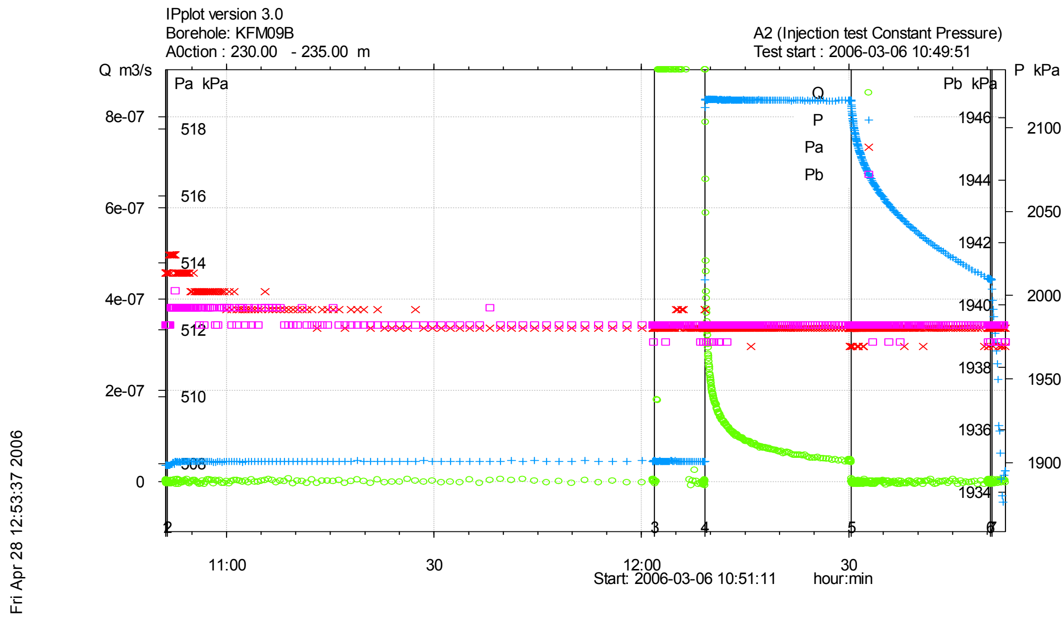


Figure A3-359. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 230.0-235.0 m in borehole KFM09B.*

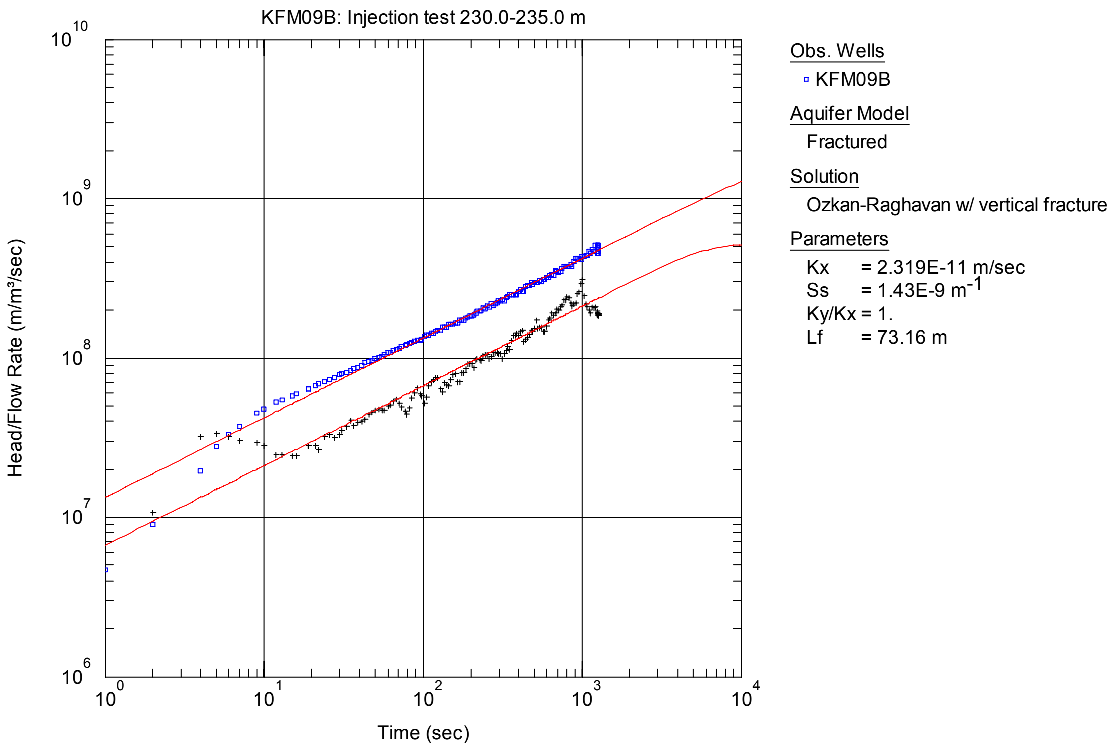


Figure A3-360. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 230.0-235.0 m in KFM09B. No unambiguous transient evaluation was possible from the injection period. This solution is only shown for demonstrative purposes.*

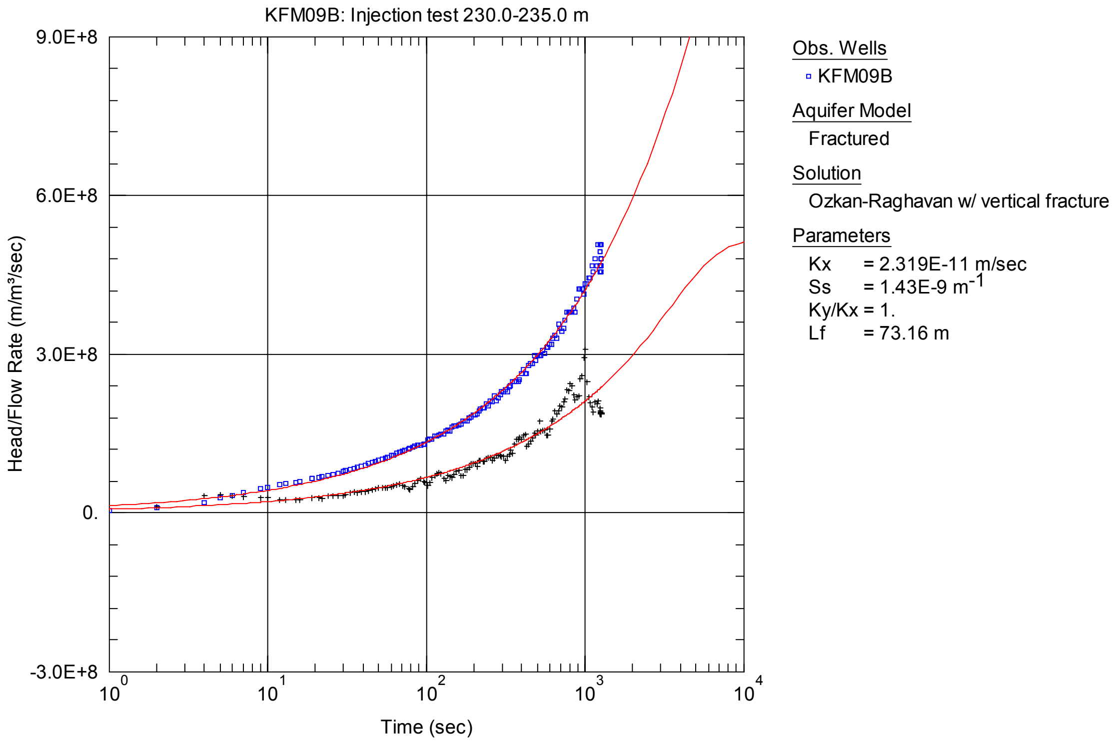


Figure A3-361. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 230.0-235.0 m in KFM09B. No unambiguous transient evaluation was possible from the injection period. This solution is only shown for demonstrative purposes.*

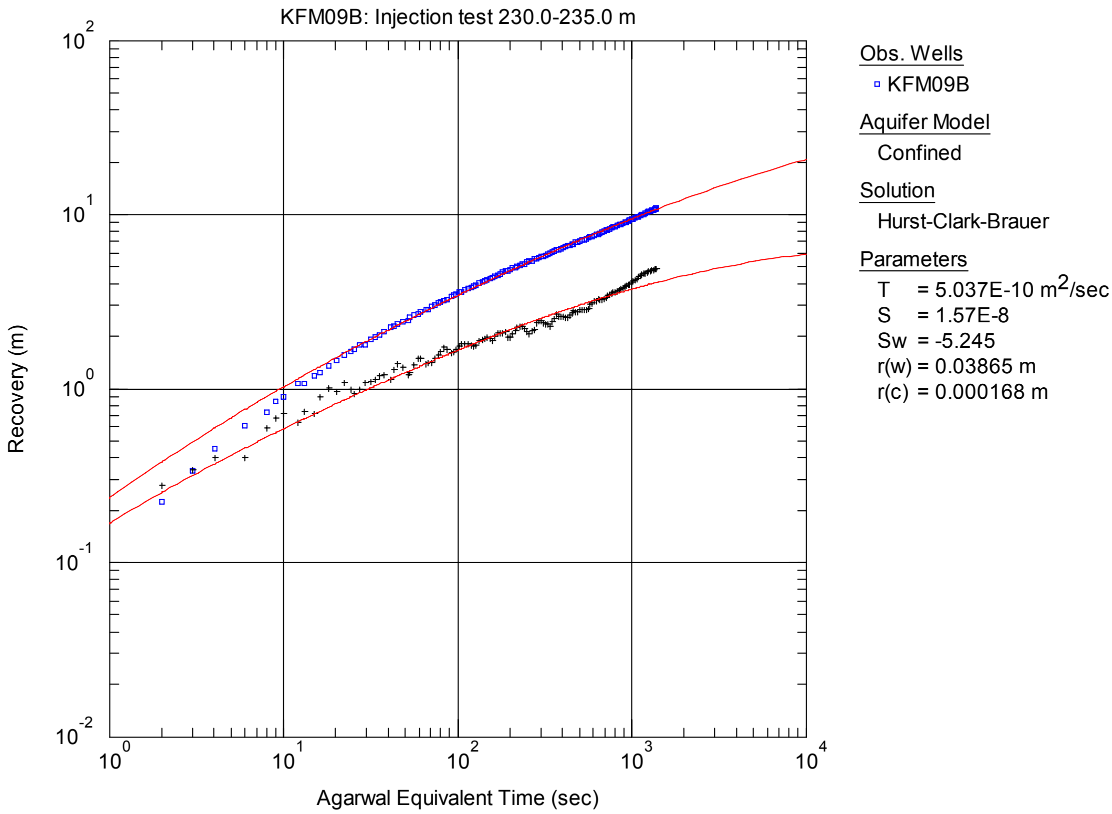


Figure A3-362. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 230.0-235.0 m in KFM09B.*

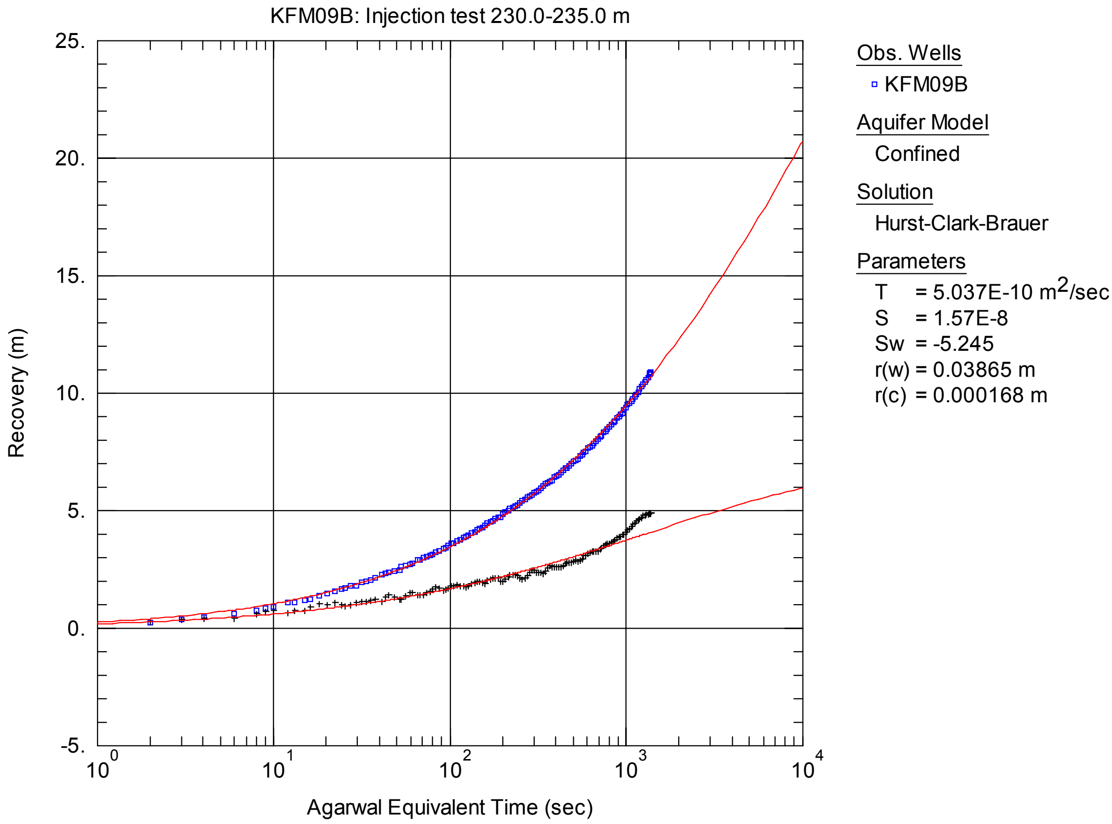


Figure A3-363. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 230.0-235.0 m in KFM09B.*

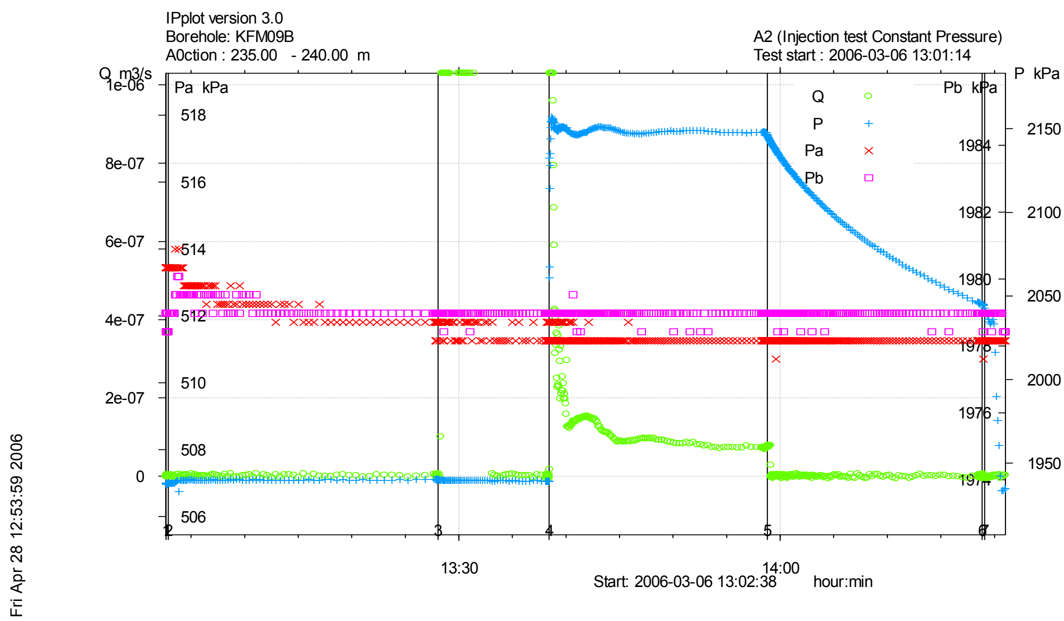


Figure A3-364. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 235.0-240.0 m in borehole KFM09B.*

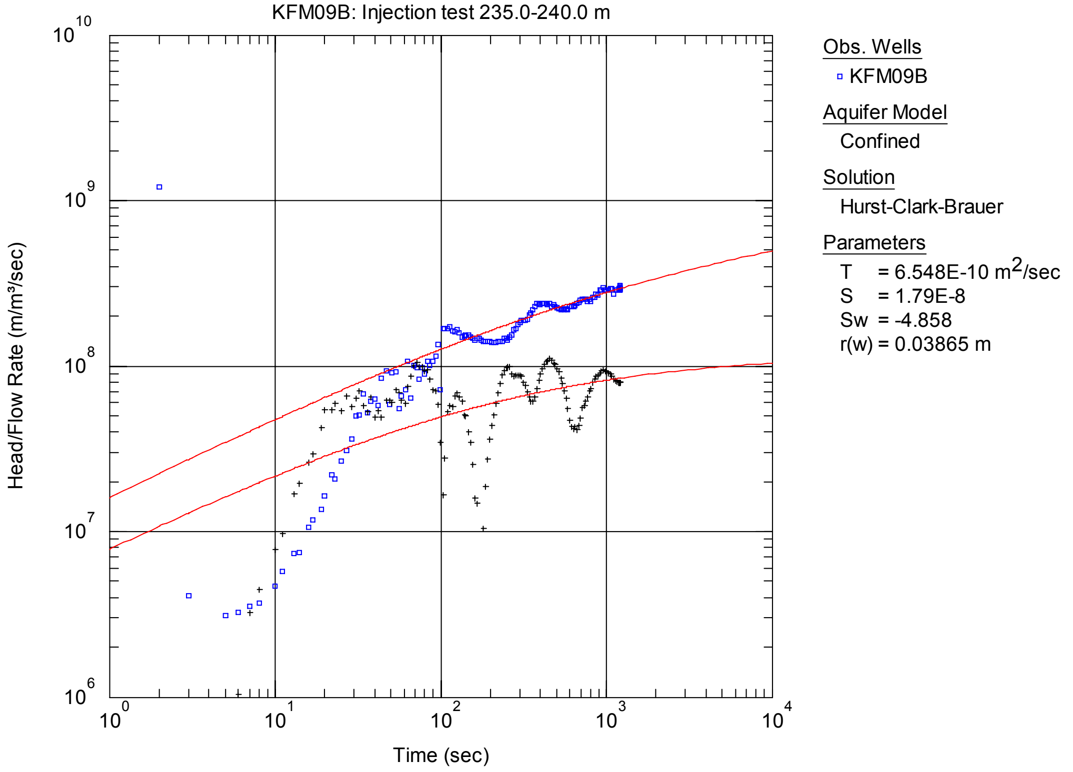


***Figure A3-365.** Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 235.0-240.0 m in KFM09B.*

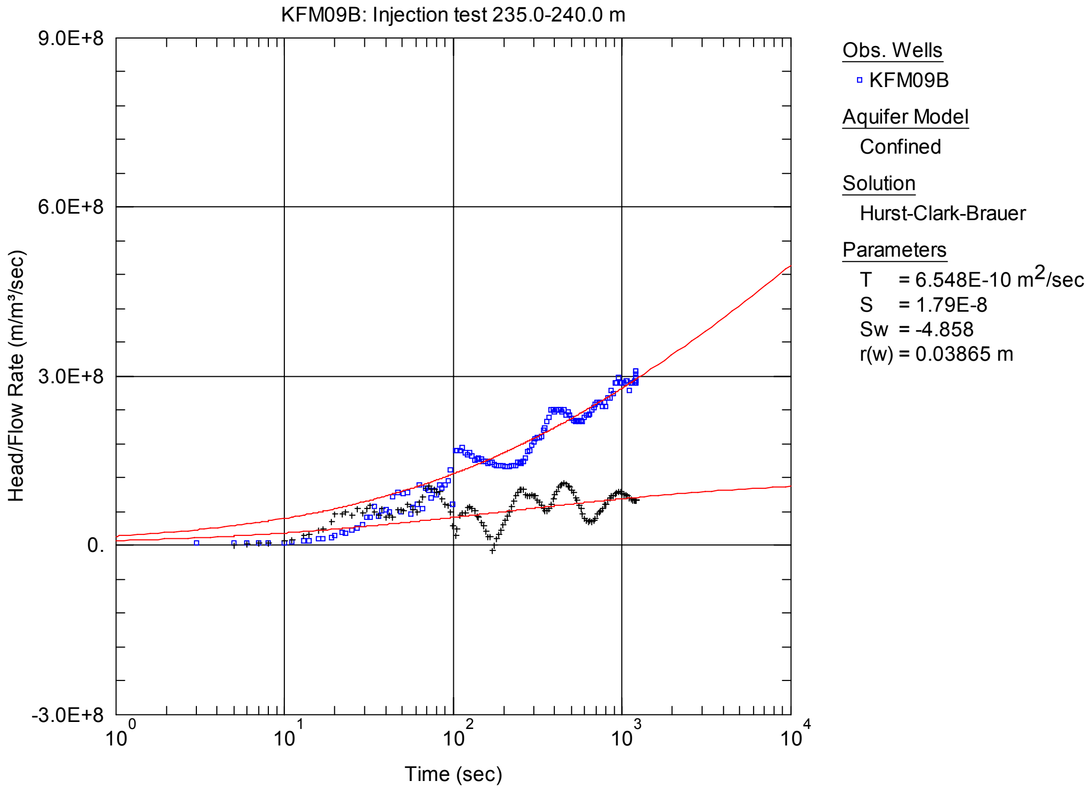


***Figure A3-366.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Hurst-Clark-Brauer solution, from the injection test in section 235.0-240.0 m in KFM09B.*

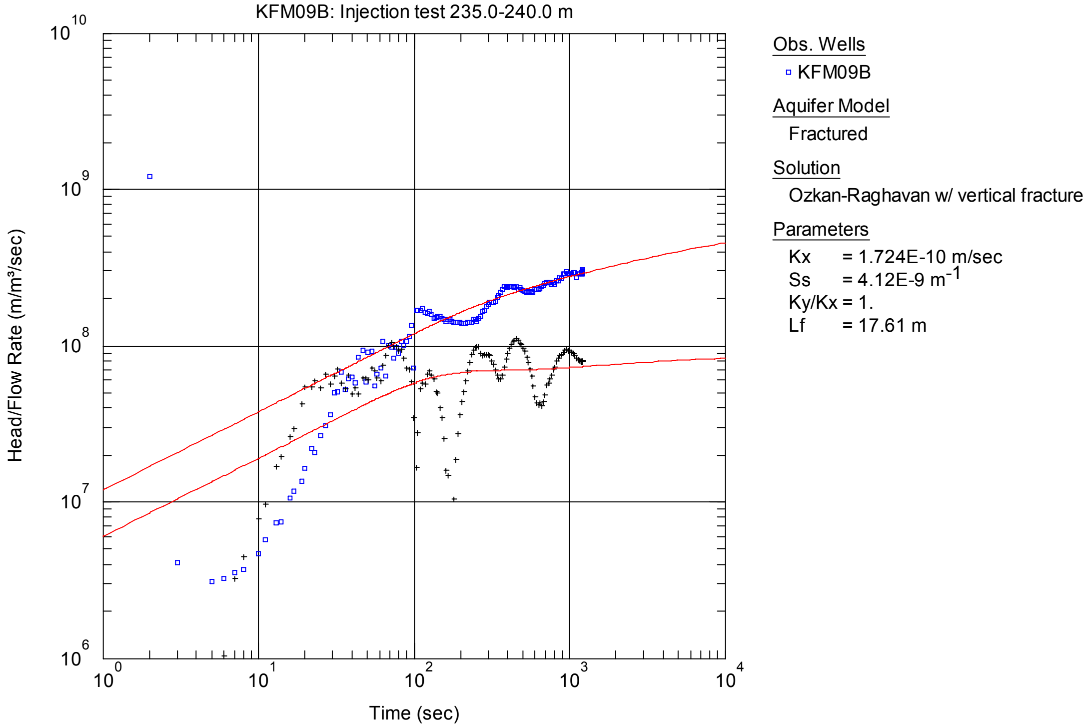


***Figure A3-367.** Log-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 235.0-240.0 m in KFM09B.*

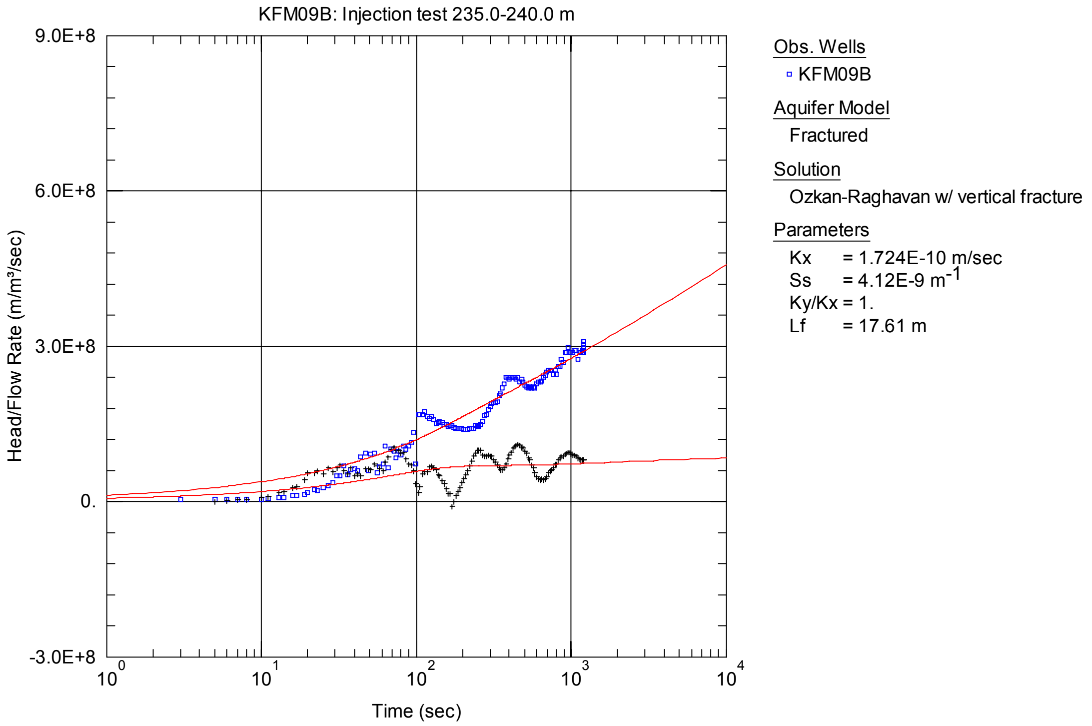


***Figure A3-368.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 235.0-240.0 m in KFM09B.*

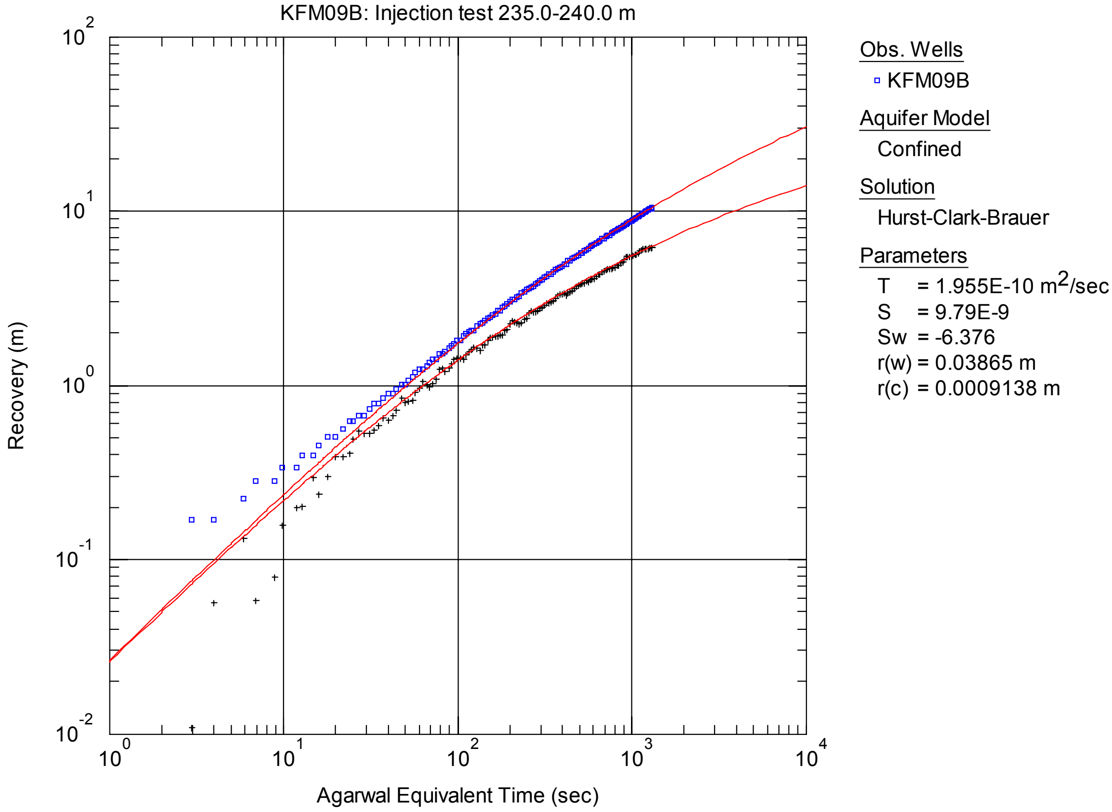


Figure A3-369. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 235.0-240.0 m in KFM09B.*

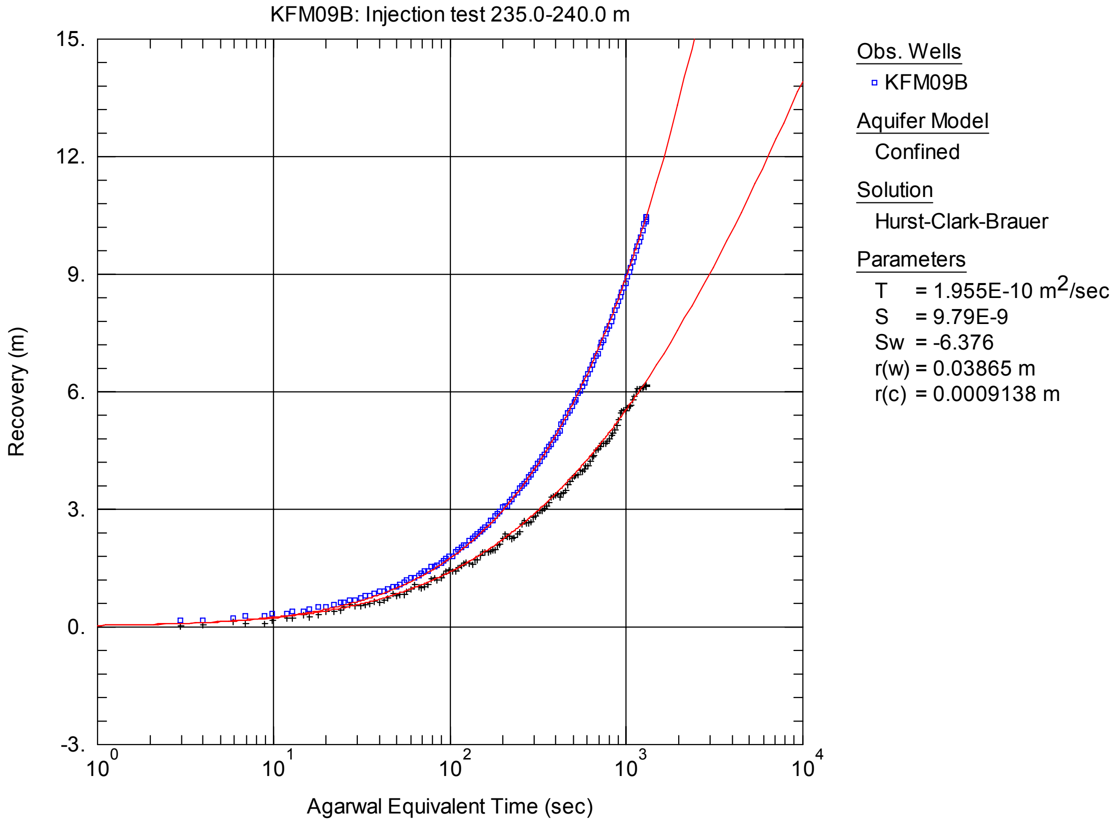


Figure A3-370. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 235.0-240.0 m in KFM09B.*

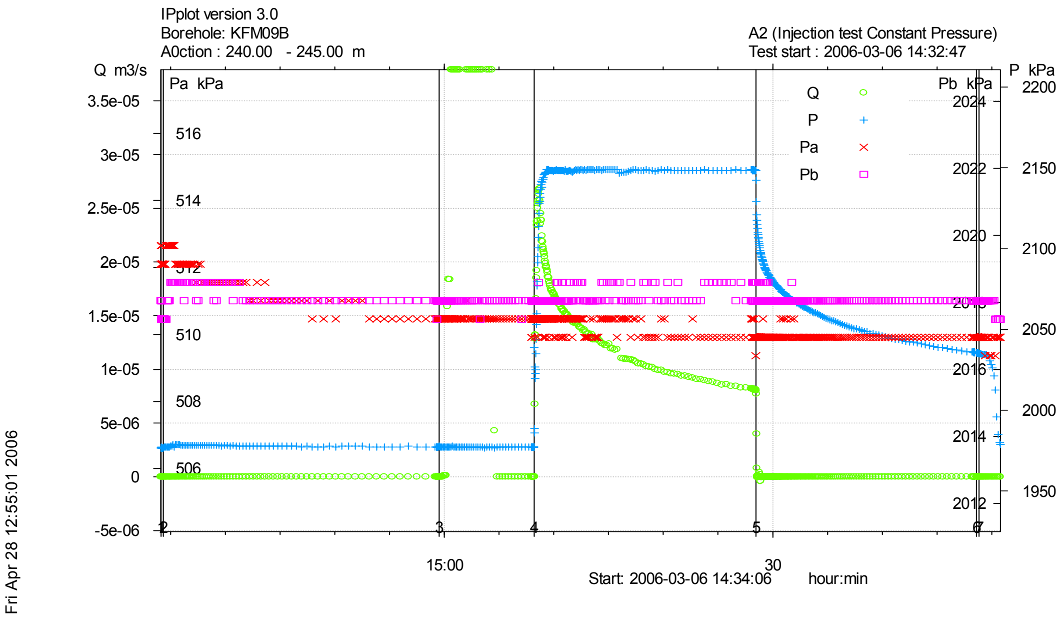


Figure A3-371. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 240.0-245.0 m in borehole KFM09B.*

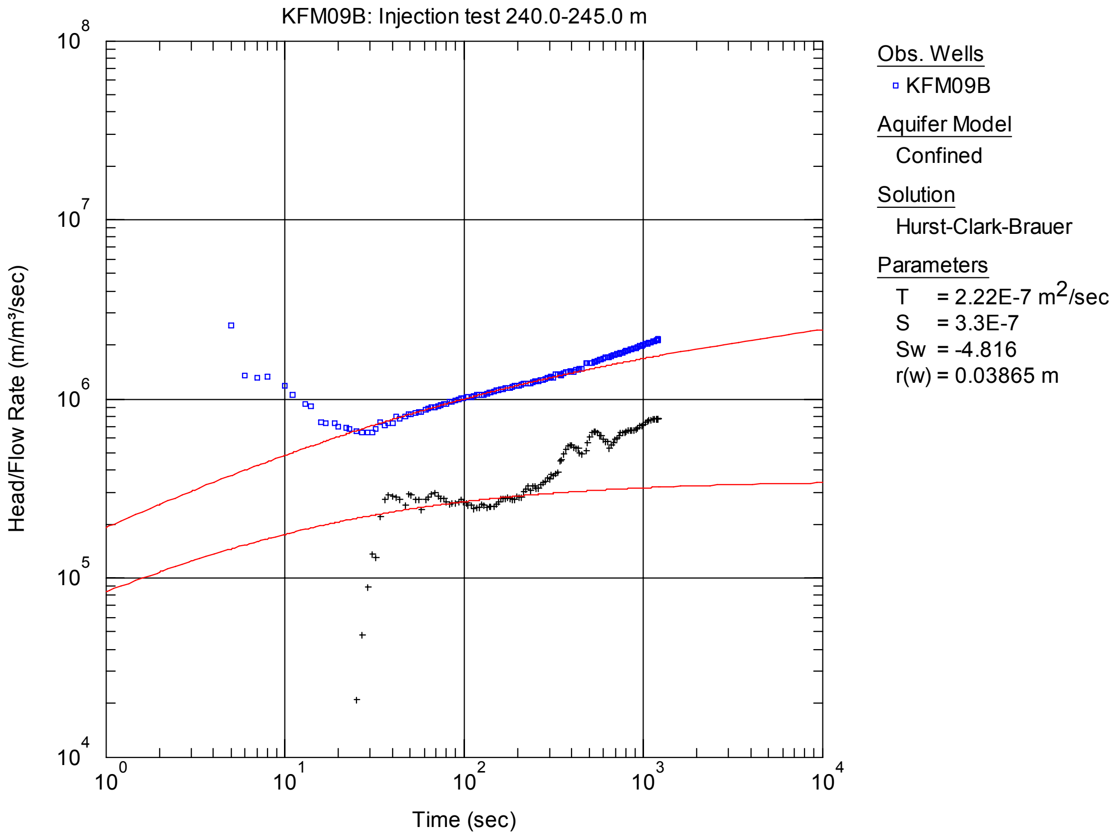


Figure A3-372. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 240.0-245.0 m in KFM09B.*

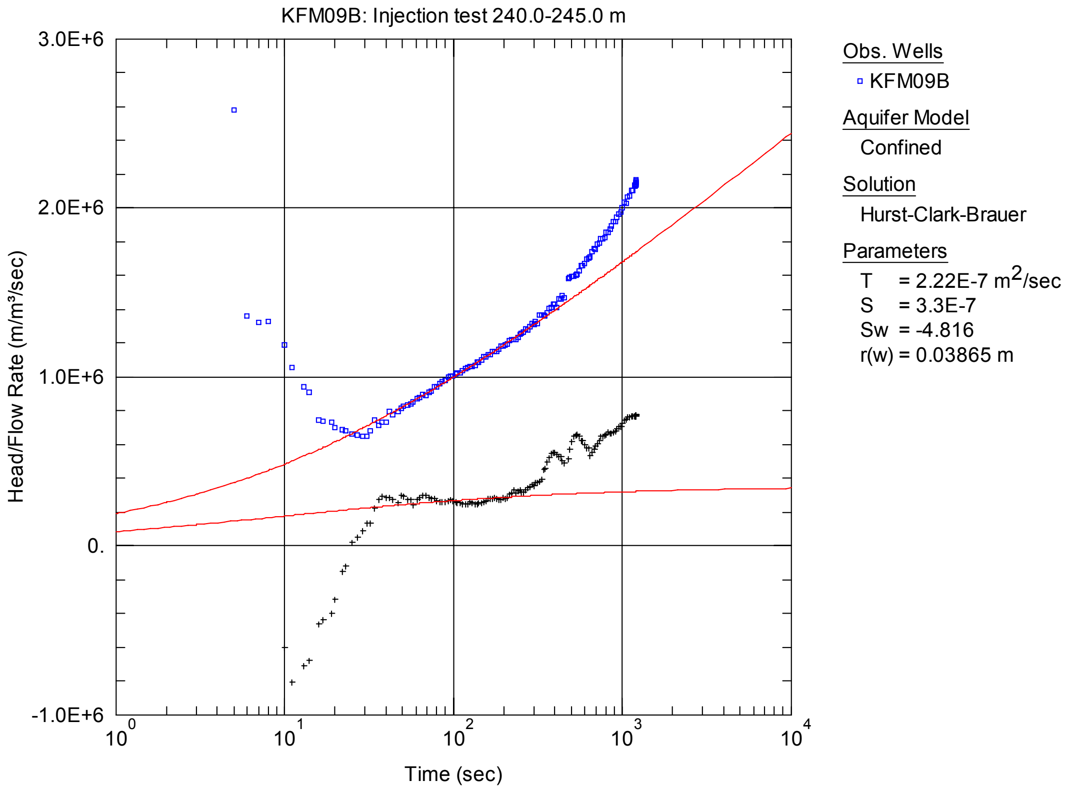


***Figure A3-373.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 240.0-245.0 m in KFM09B.*

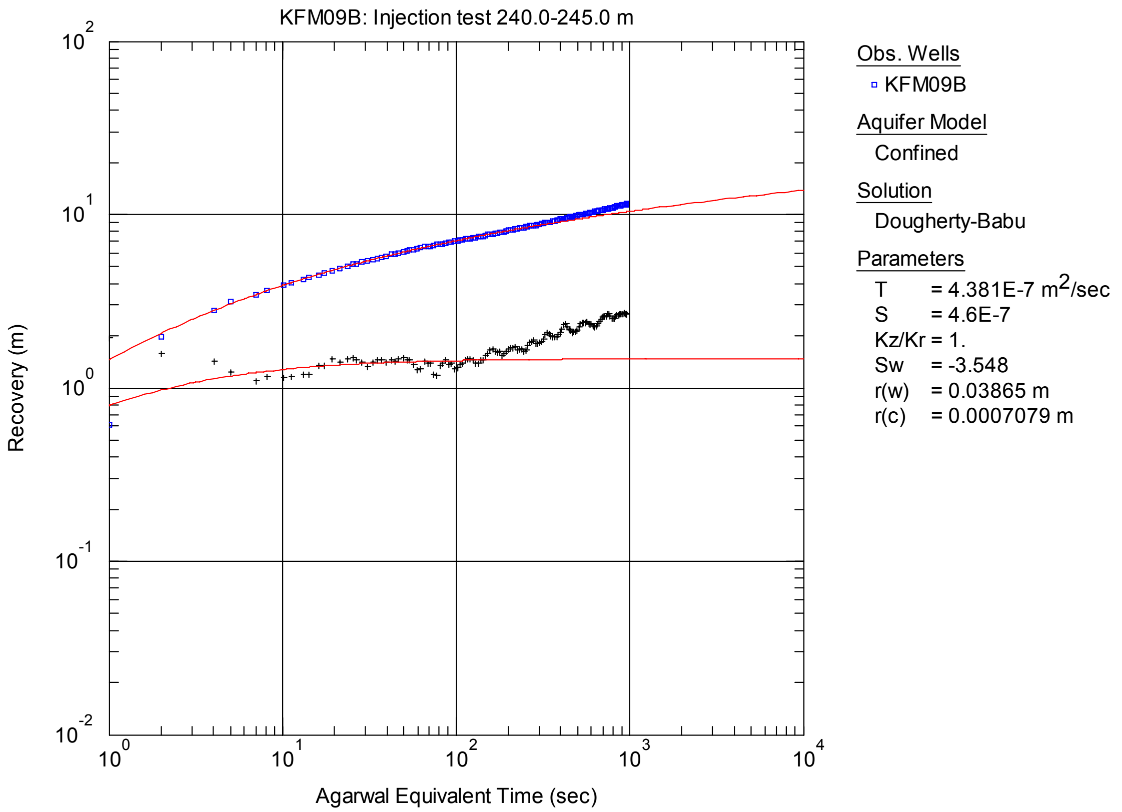


***Figure A3-374.** Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 240.0-245.0 m in KFM09B.*

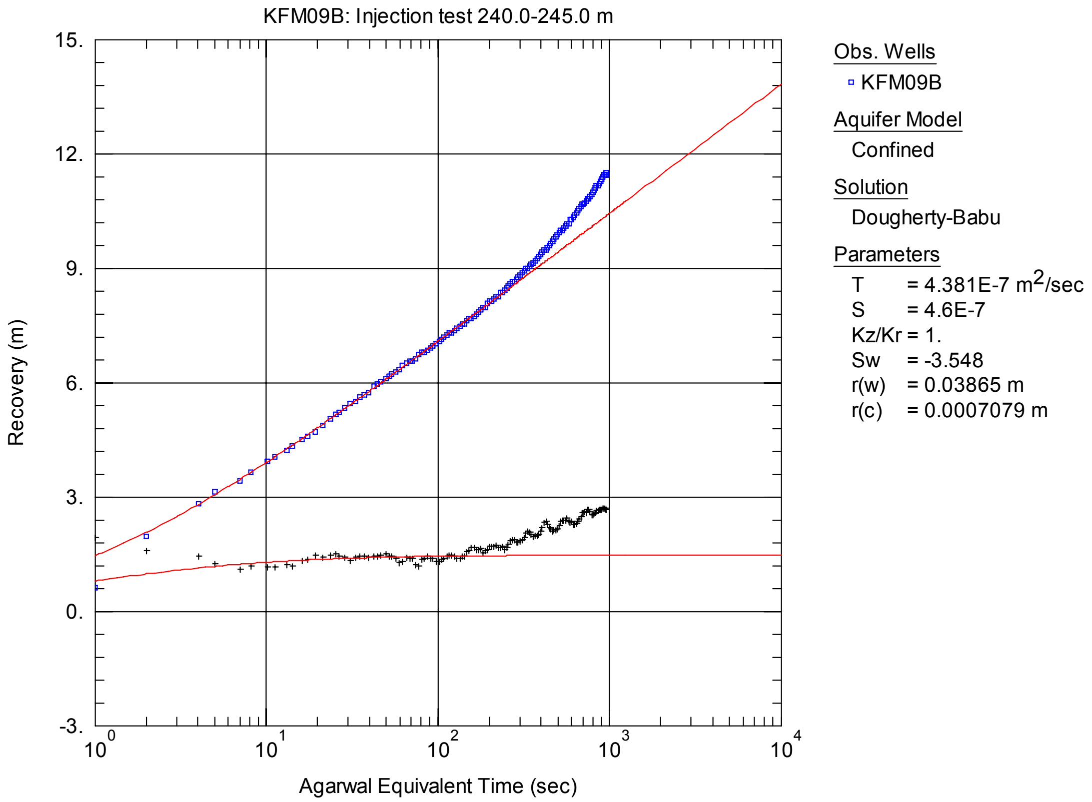


***Figure A3-375.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 240.0-245.0 m in KFM09B.*

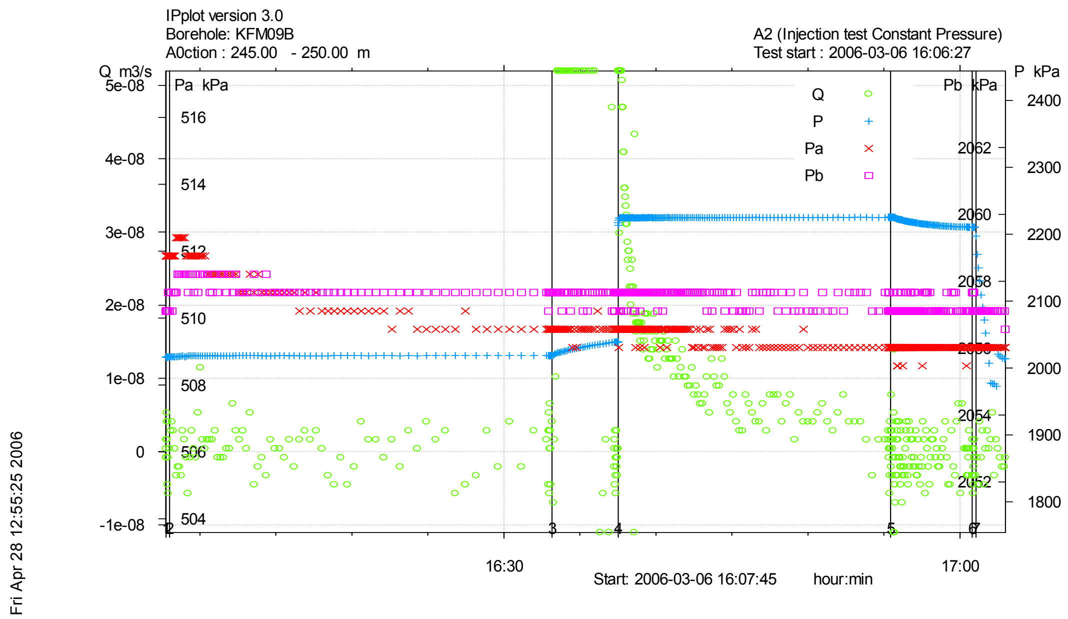


***Figure A3-376.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 245.0-250.0 m in borehole KFM09B.*

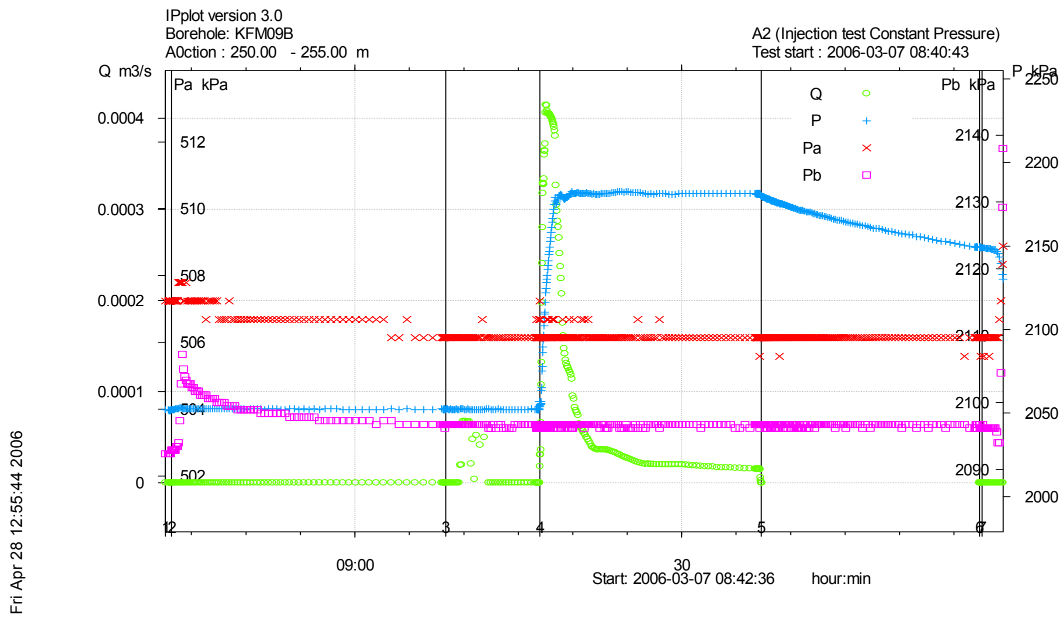


***Figure A3-377.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 250.0-255.0 m in borehole KFM09B.*

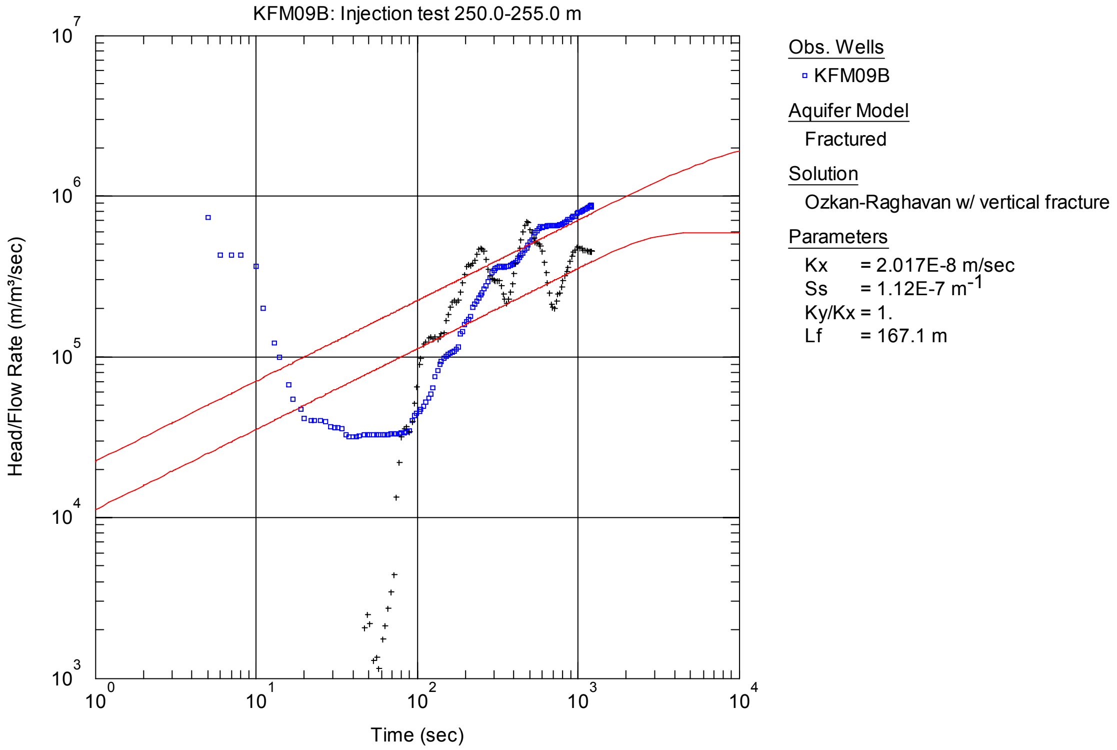


***Figure A3-378.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 250.0-255.0 m in KFM09B. No unambiguous transient evaluation was possible from the injection period. This solution is only shown for demonstrative purposes.*

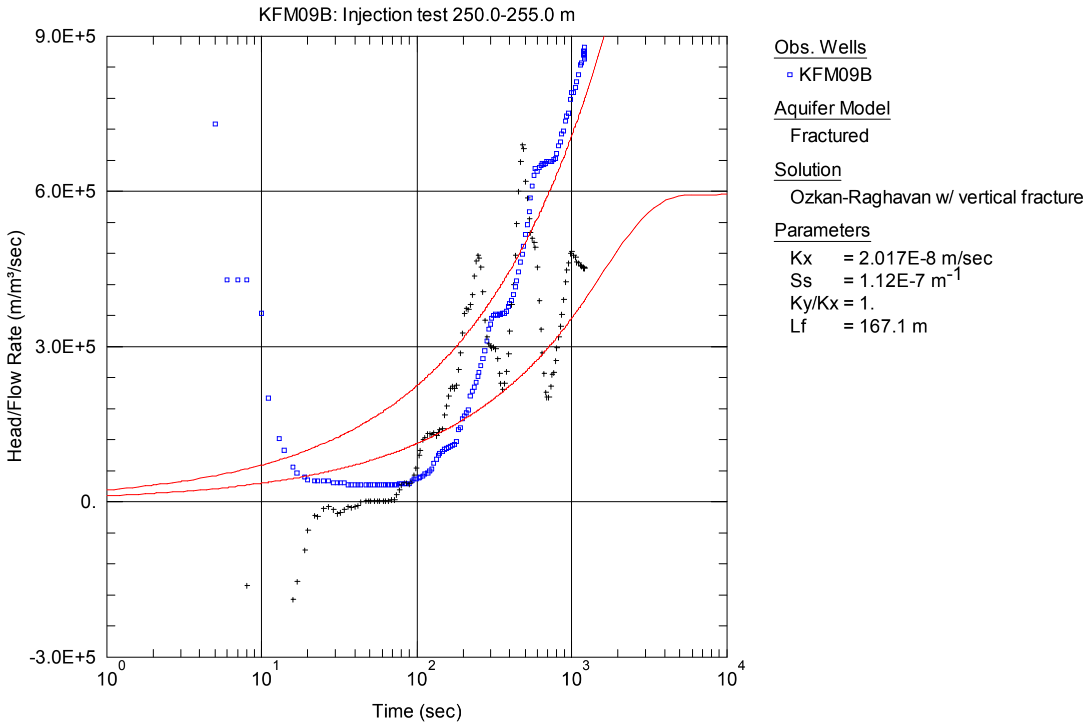


Figure A3-379. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 250.0-255.0 m in KFM09B. No unambiguous transient evaluation was possible from the injection period. This solution is only shown for demonstrative purposes.*

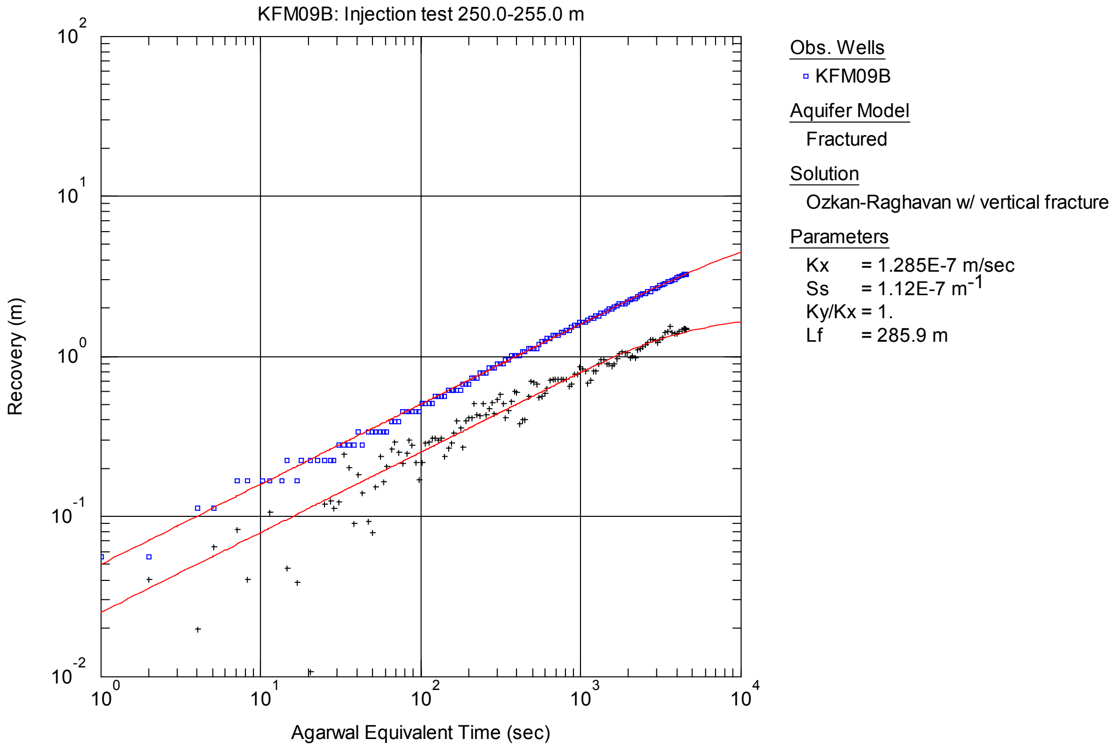


Figure A3-380. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 250.0-255.0 m in KFM09B.*

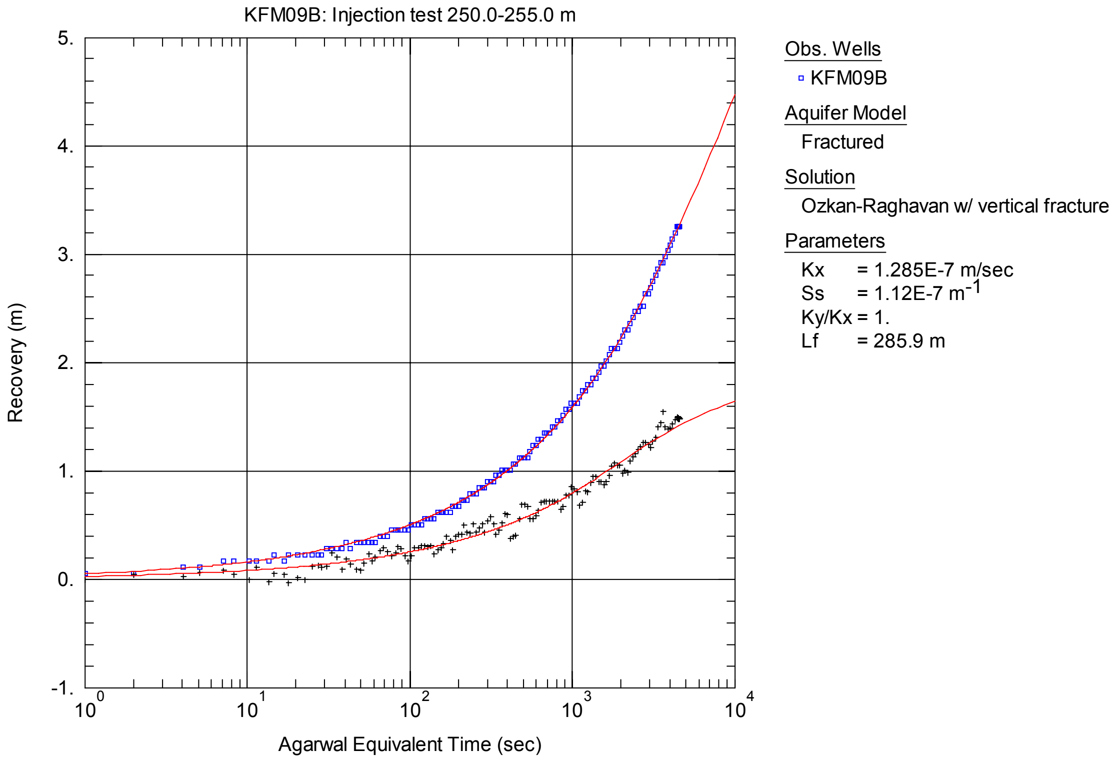


Figure A3-381. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 250.0-255.0 m in KFM09B.*

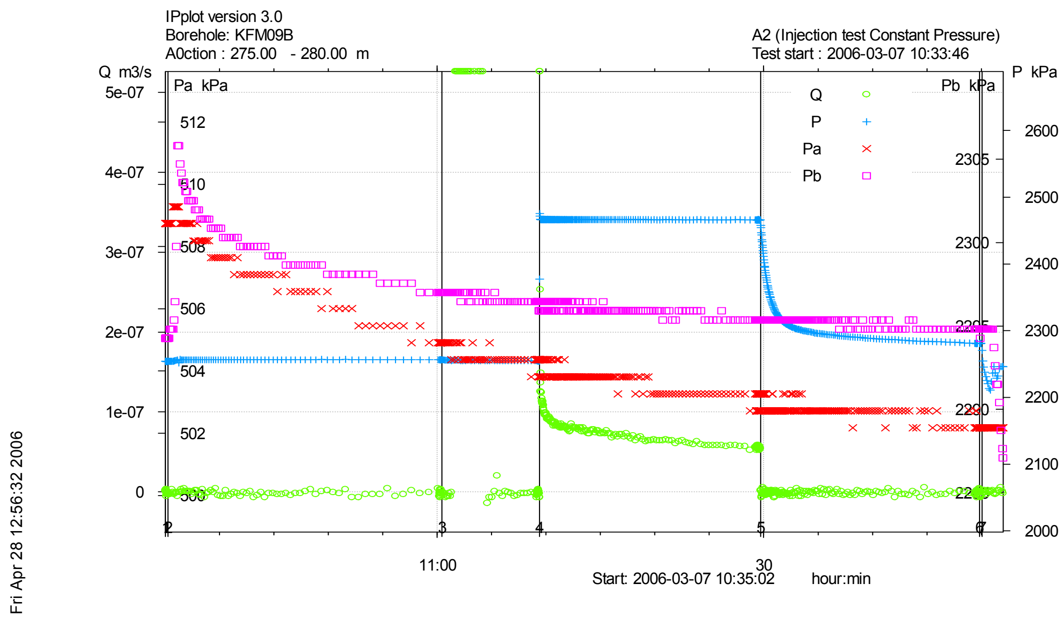


Figure A3-382. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 275.0-280.0 m in borehole KFM09B.*

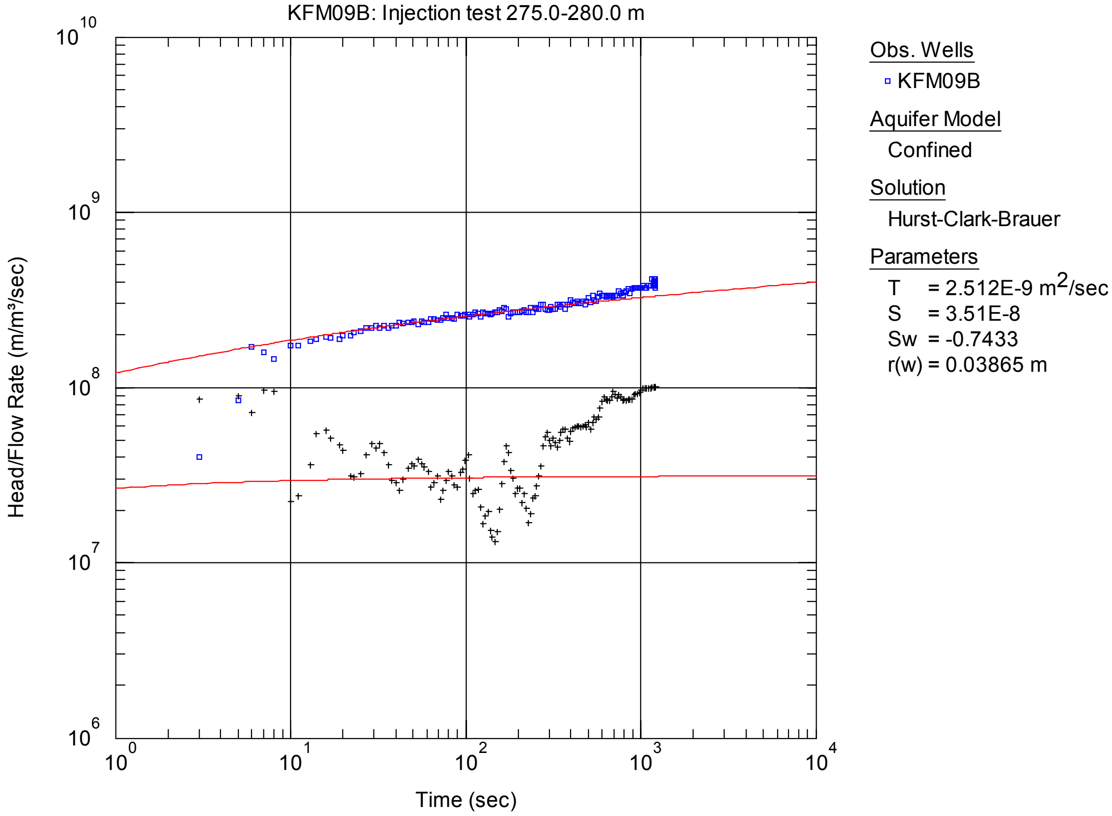


***Figure A3-383.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 275.0-280.0 m in KFM09B.*

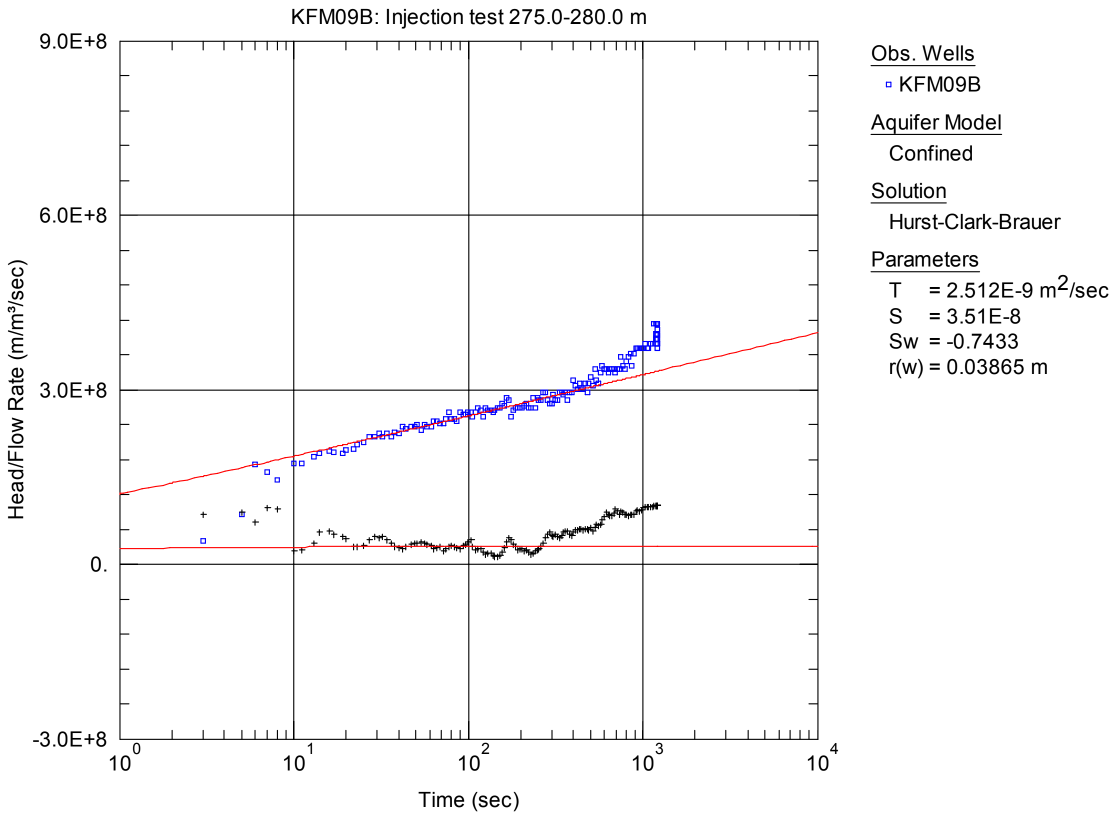


***Figure A3-384.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 275.0-280.0 m in KFM09B.*

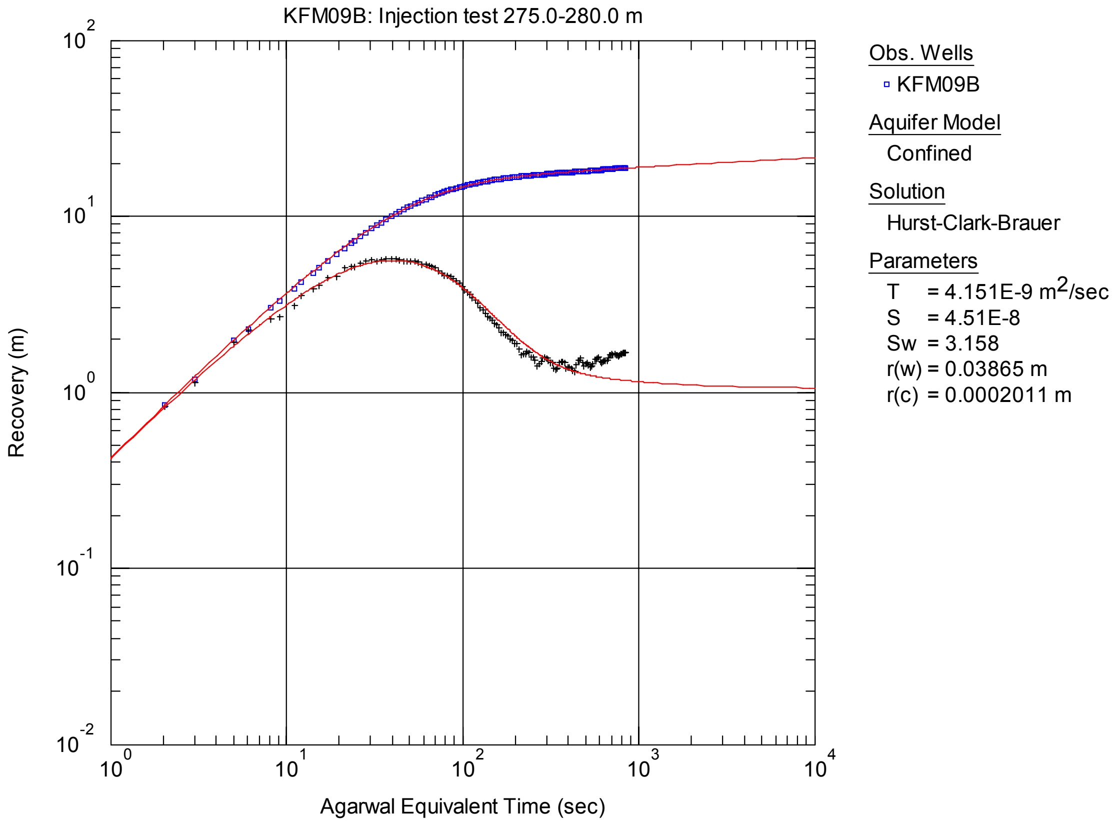


Figure A3-385. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 275.0-280.0 m in KFM09B.*

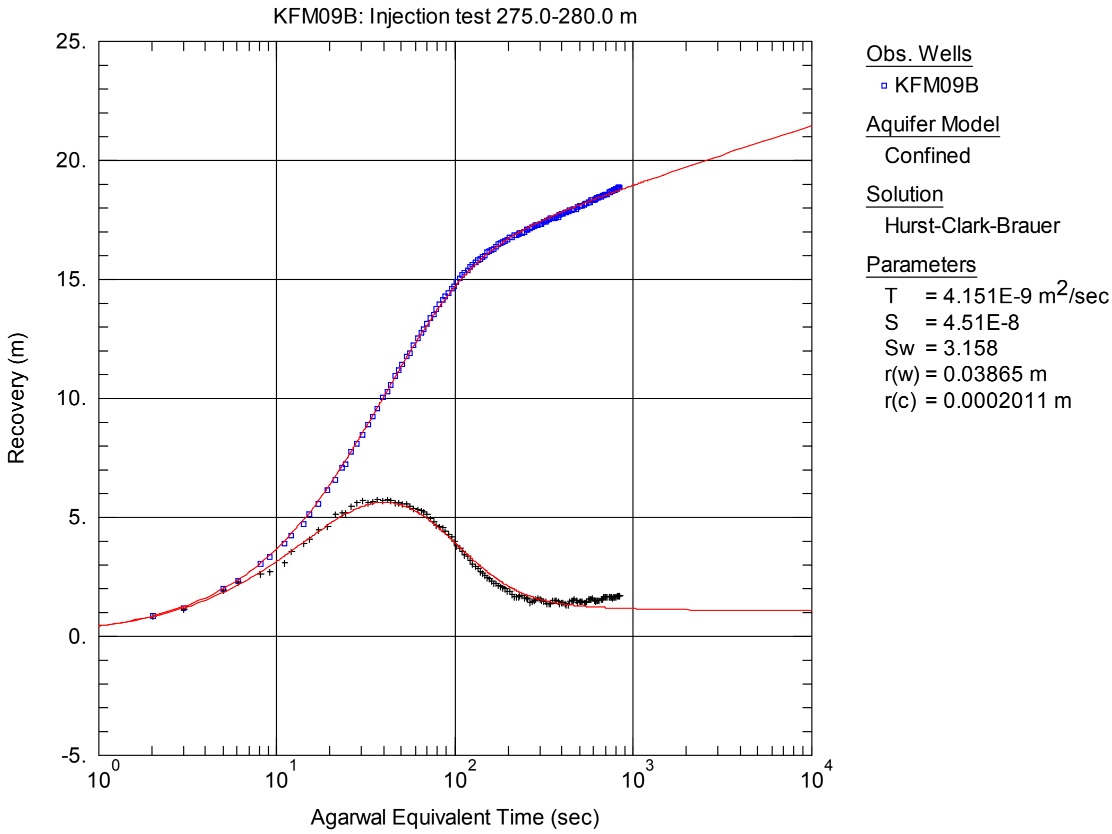


Figure A3-386. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 275.0-280.0 m in KFM09B.*

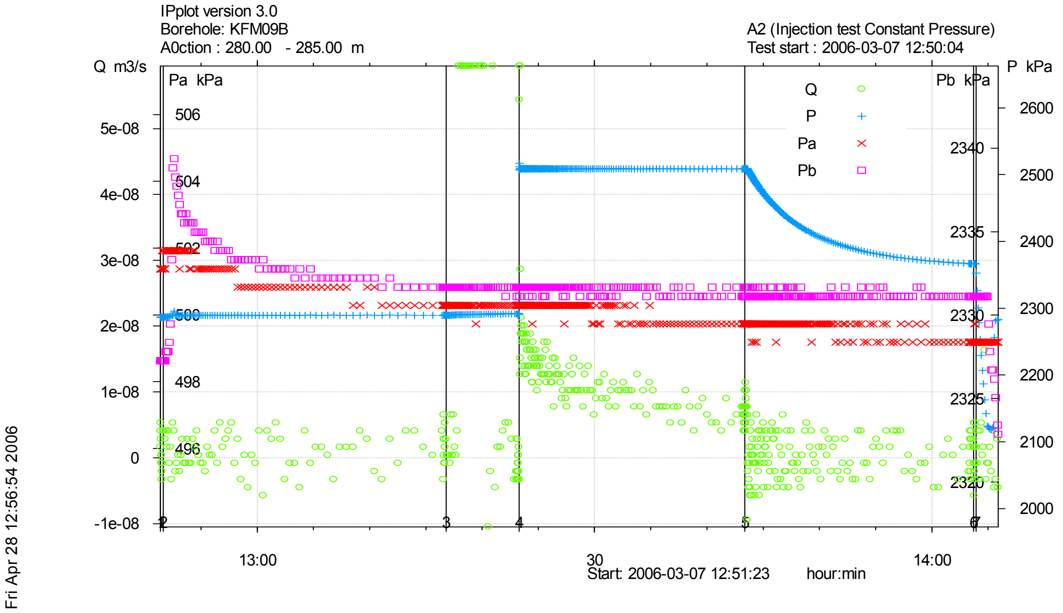


Figure A3-387. Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 280.0-285.0 m in borehole KFM09B.

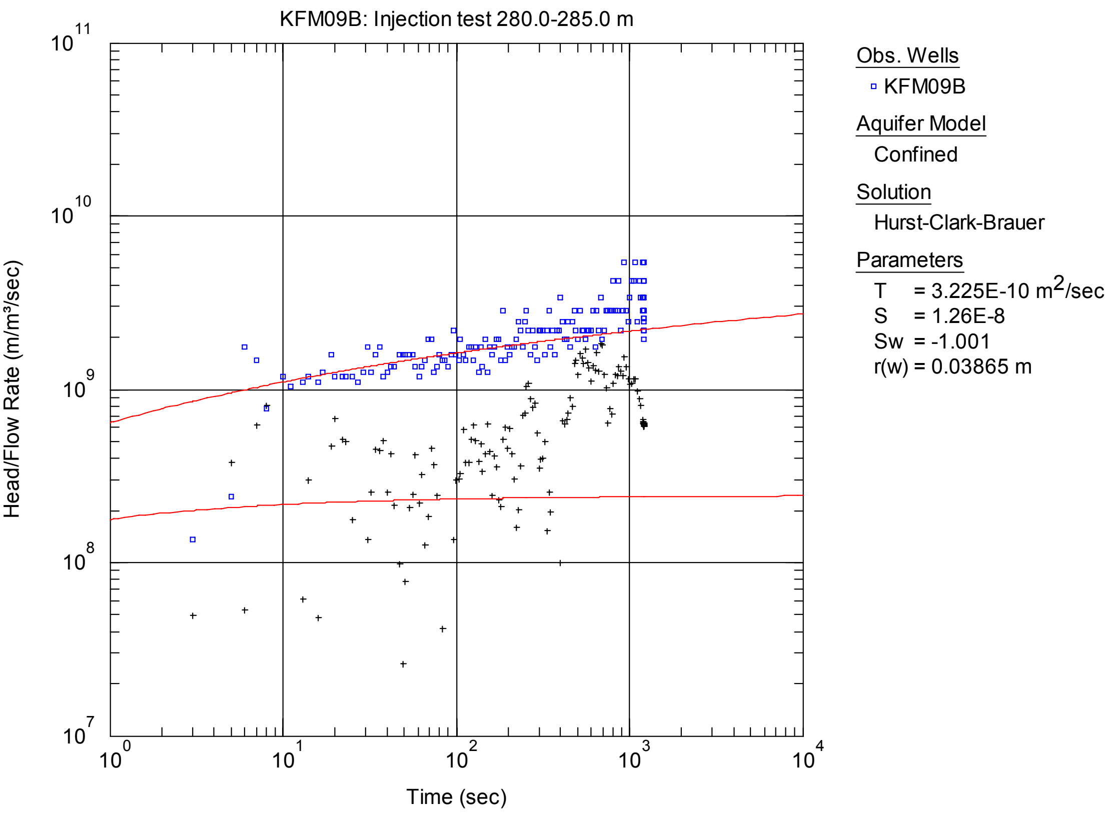


Figure A3-388. Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 280.0-285.0 m in KFM09B.

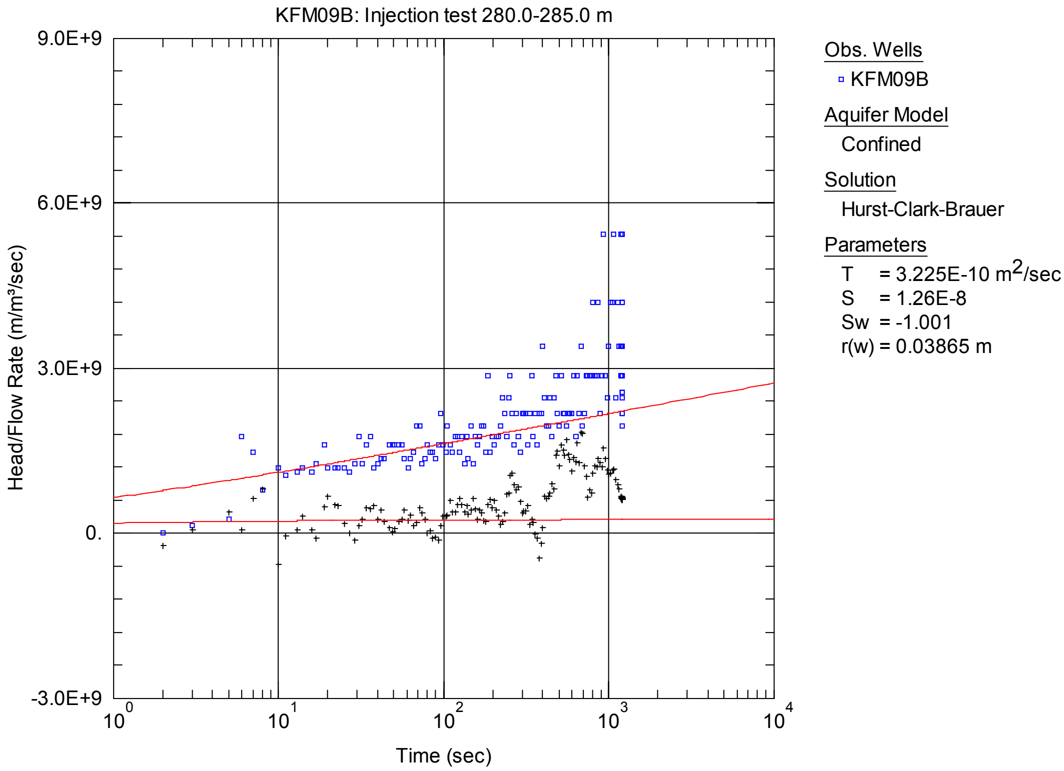


Figure A3-389. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 280.0-285.0 m in KFM09B.*

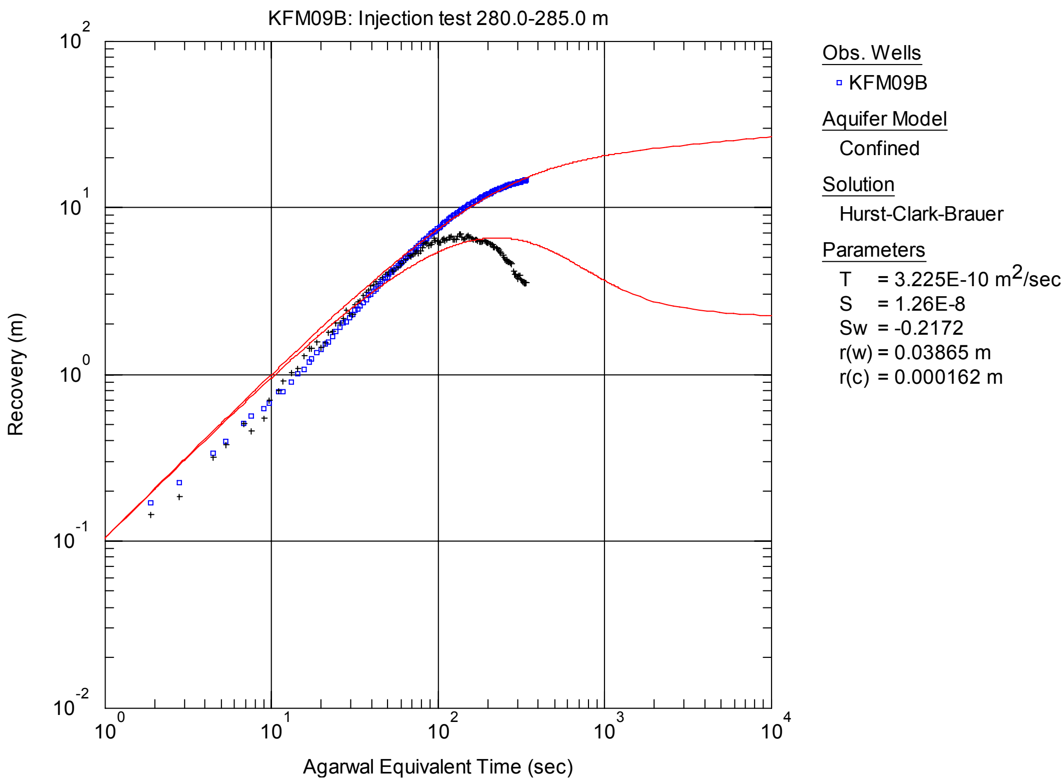


Figure A3-390. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 280.0-285.0 m in KFM09B. No unambiguous transient evaluation was possible for the recovery period. This diagram demonstrates a solution assuming the same transmissivity and storativity as were estimated from the injection period.*

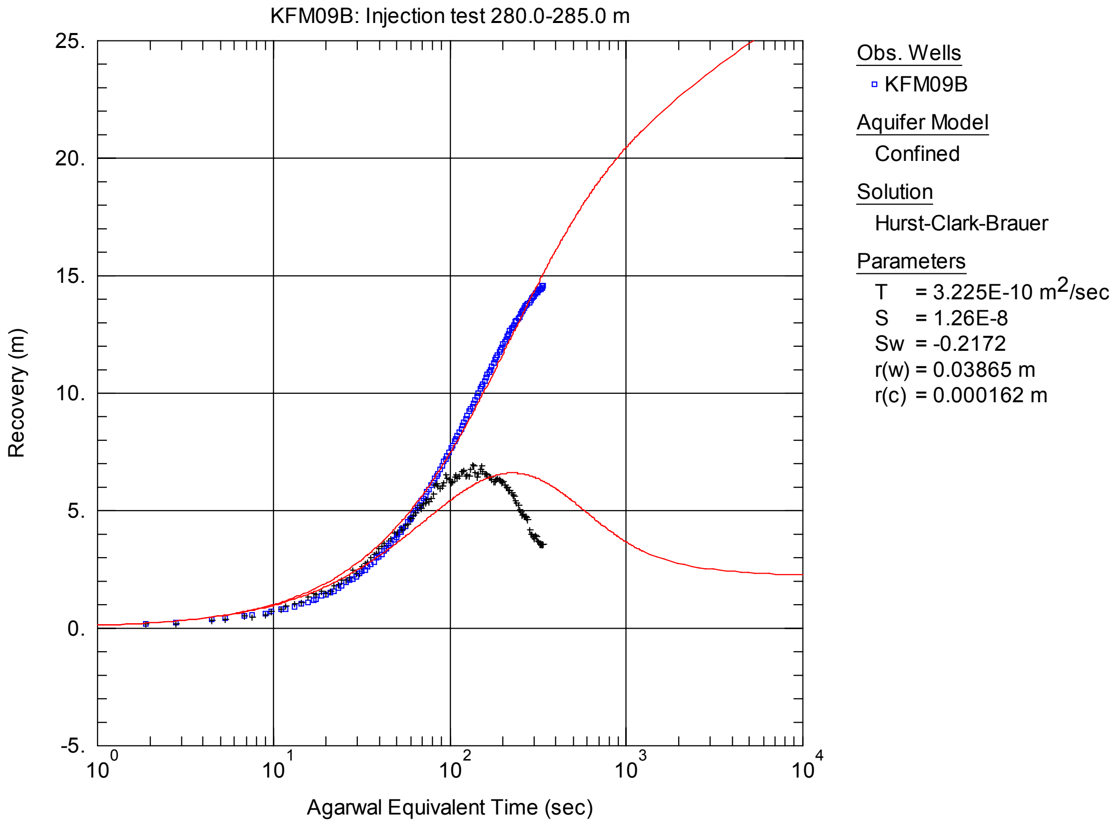


Figure A3-391. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 280.0-285.0 m in KFM09B. No unambiguous transient evaluation was possible for the recovery period. This diagram demonstrates a solution assuming the same transmissivity and storativity as were estimated from the injection period.*

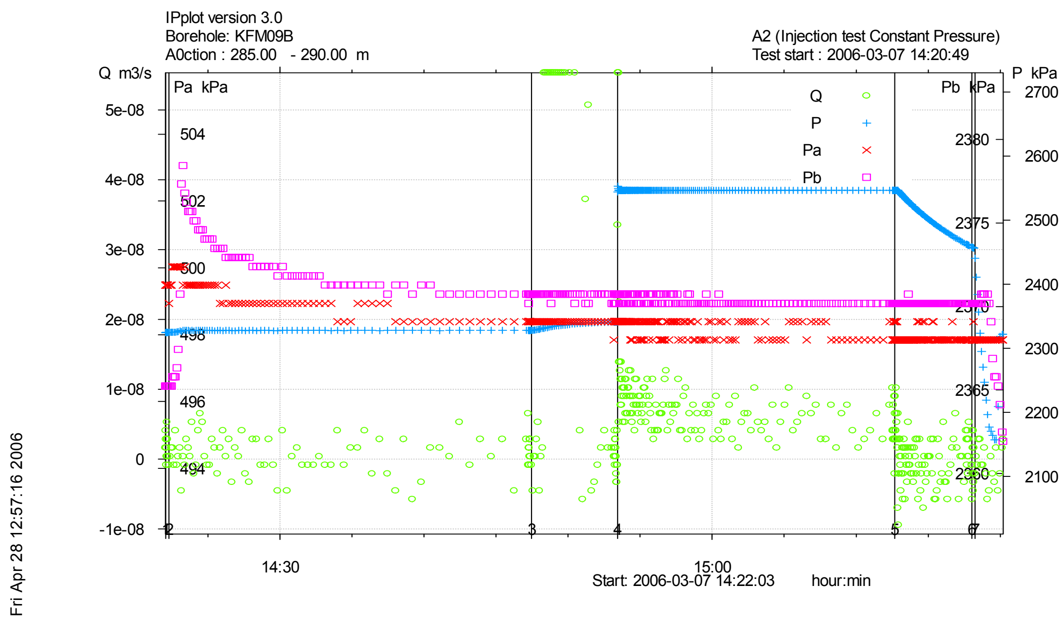


Figure A3-392. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 285.0-290.0 m in borehole KFM09B.*

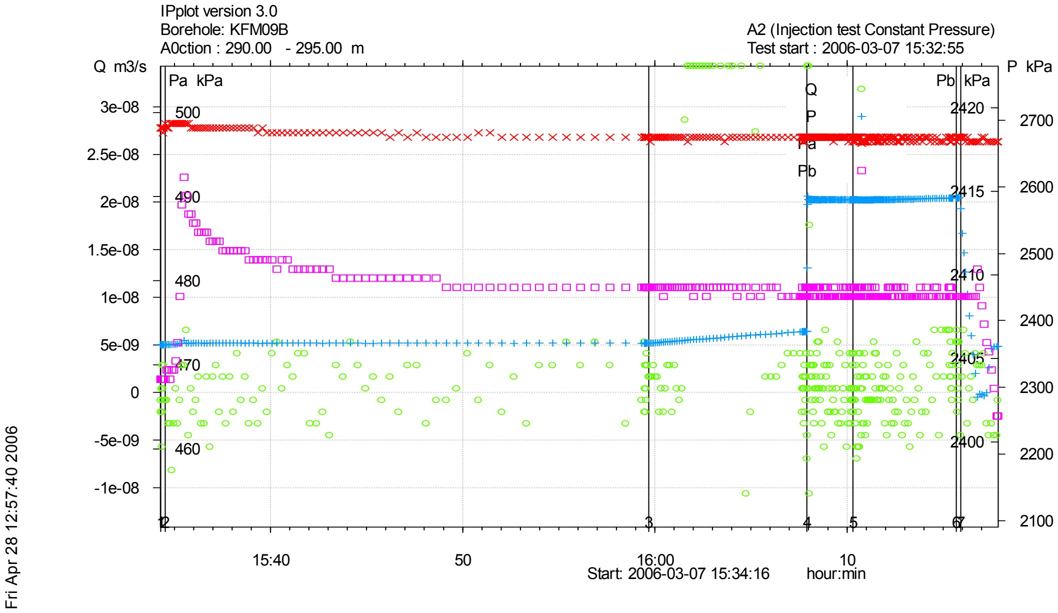


Figure A3-393. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 290.0-295.0 m in borehole KFM09B.*

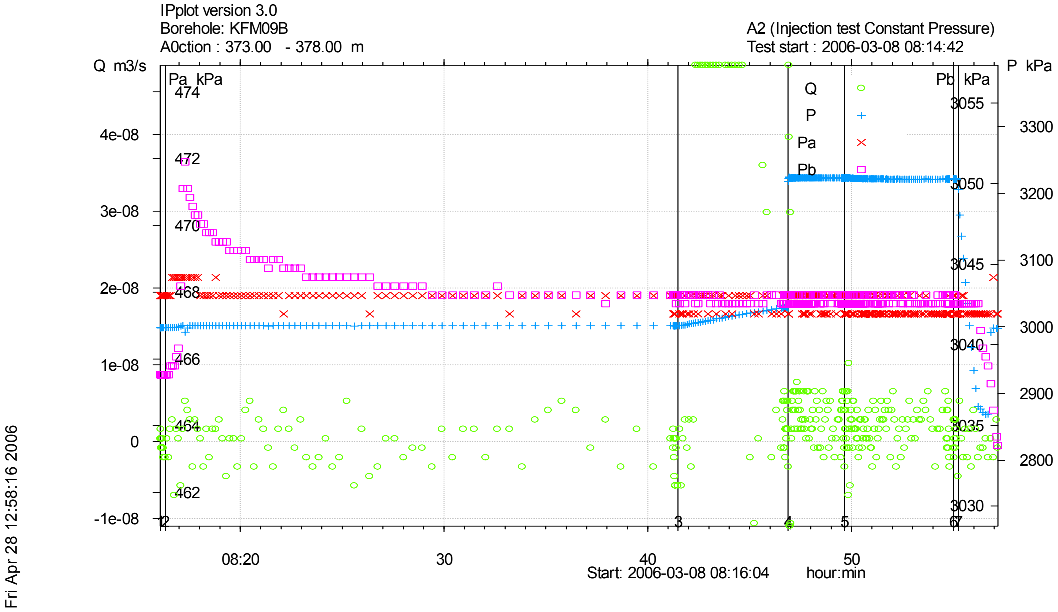


Figure A3-394. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 373.0-378.0 m in borehole KFM09B.*

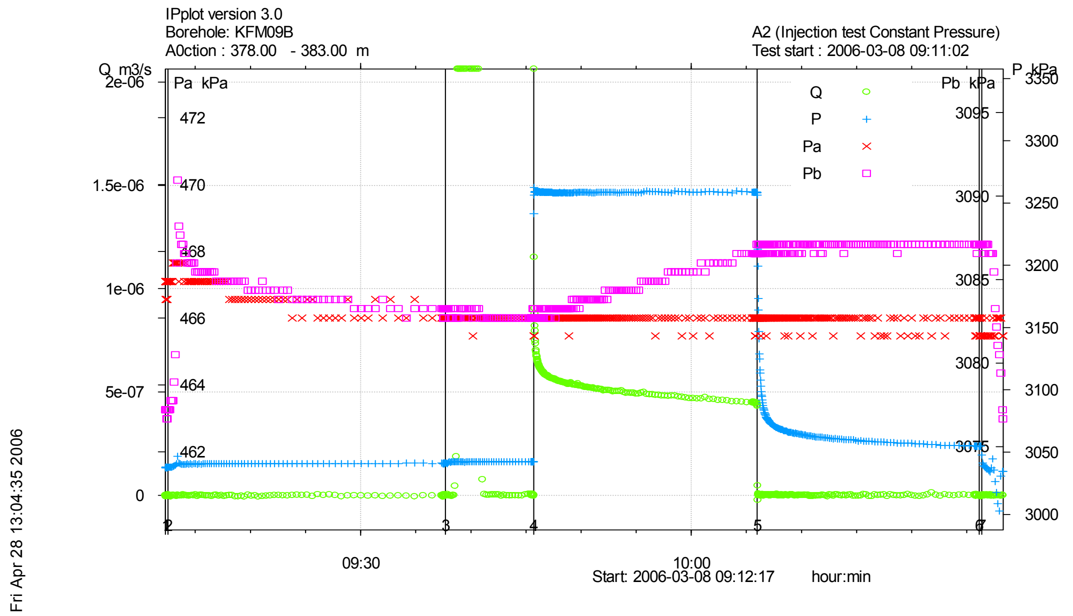


Figure A3-395. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 378.0-383.0 m in borehole KFM09B.*

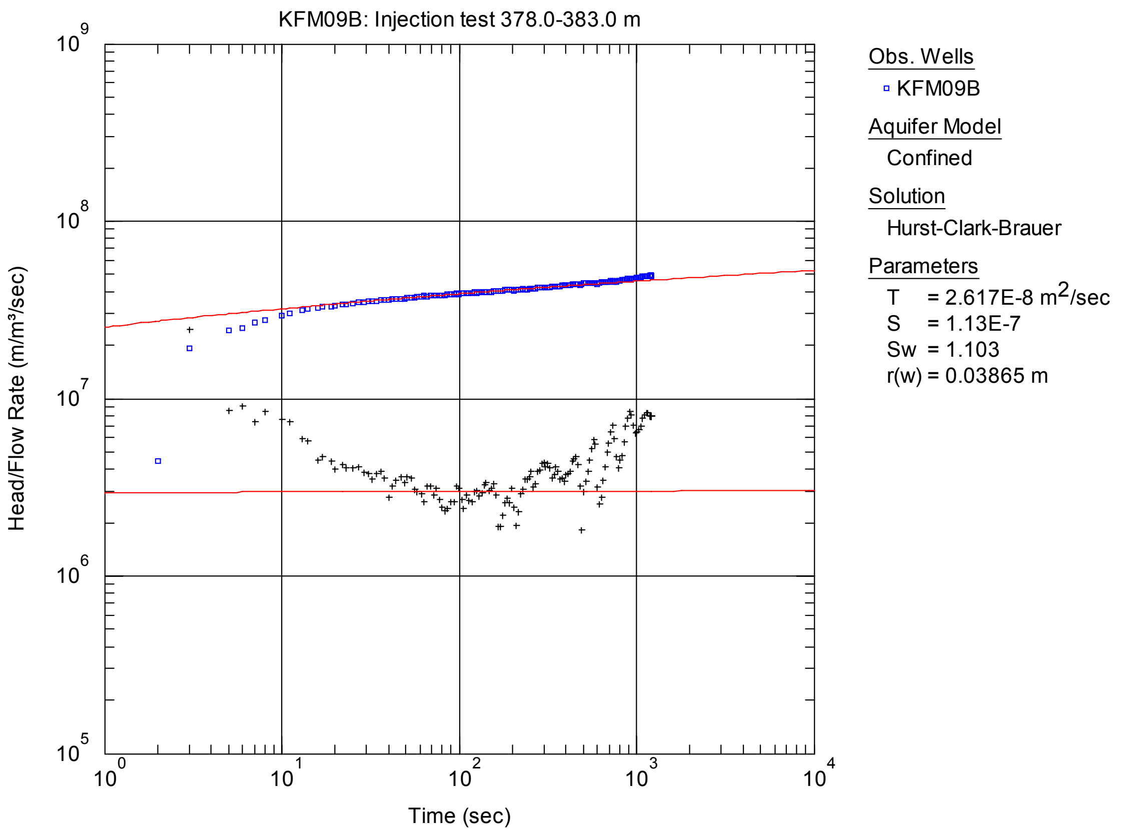


Figure A3-396. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 378.0-383.0 m in KFM09B.*

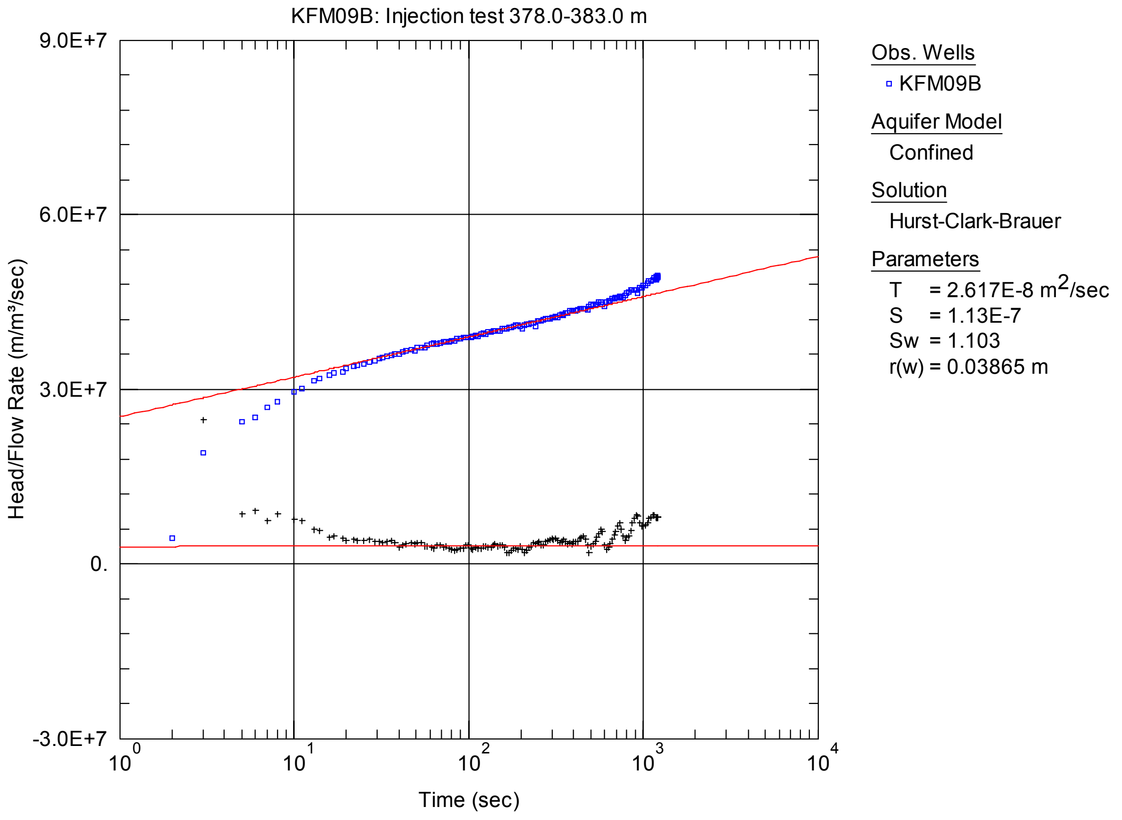


Figure A3-397. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 378.0-383.0 m in KFM09B.*

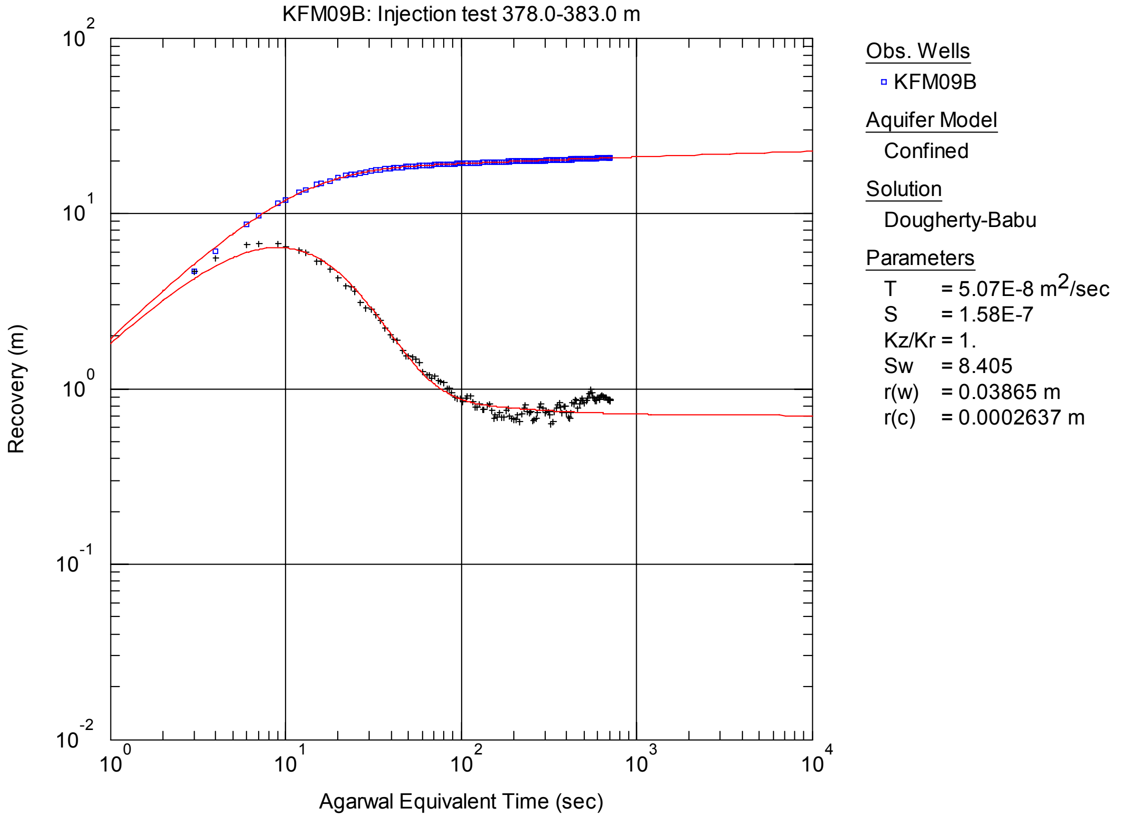


Figure A3-398. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 378.0-383.0 m in KFM09B.*

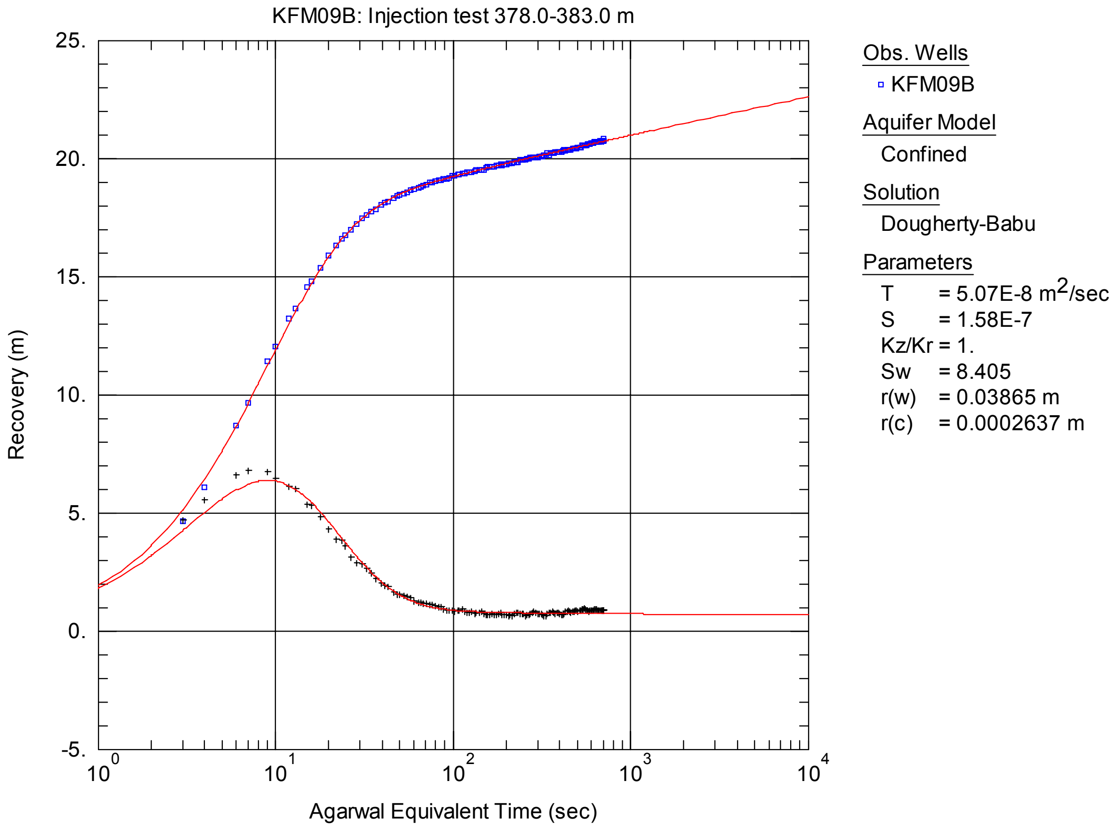


Figure A3-399. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 378.0-383.0 m in KFM09B.*

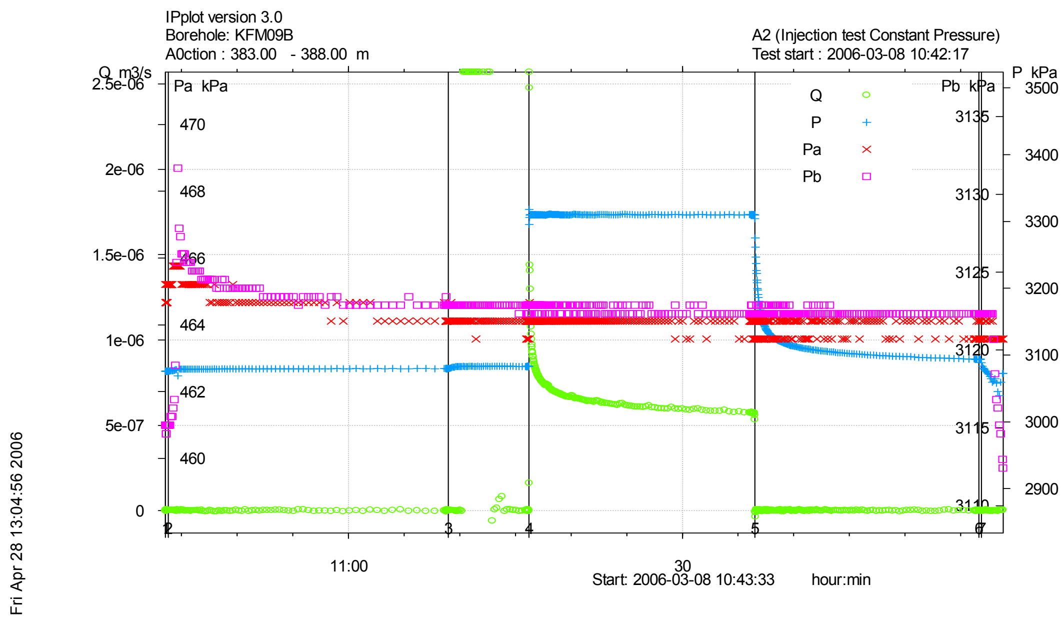


Figure A3-400. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 383.0-388.0 m in borehole KFM09B.*

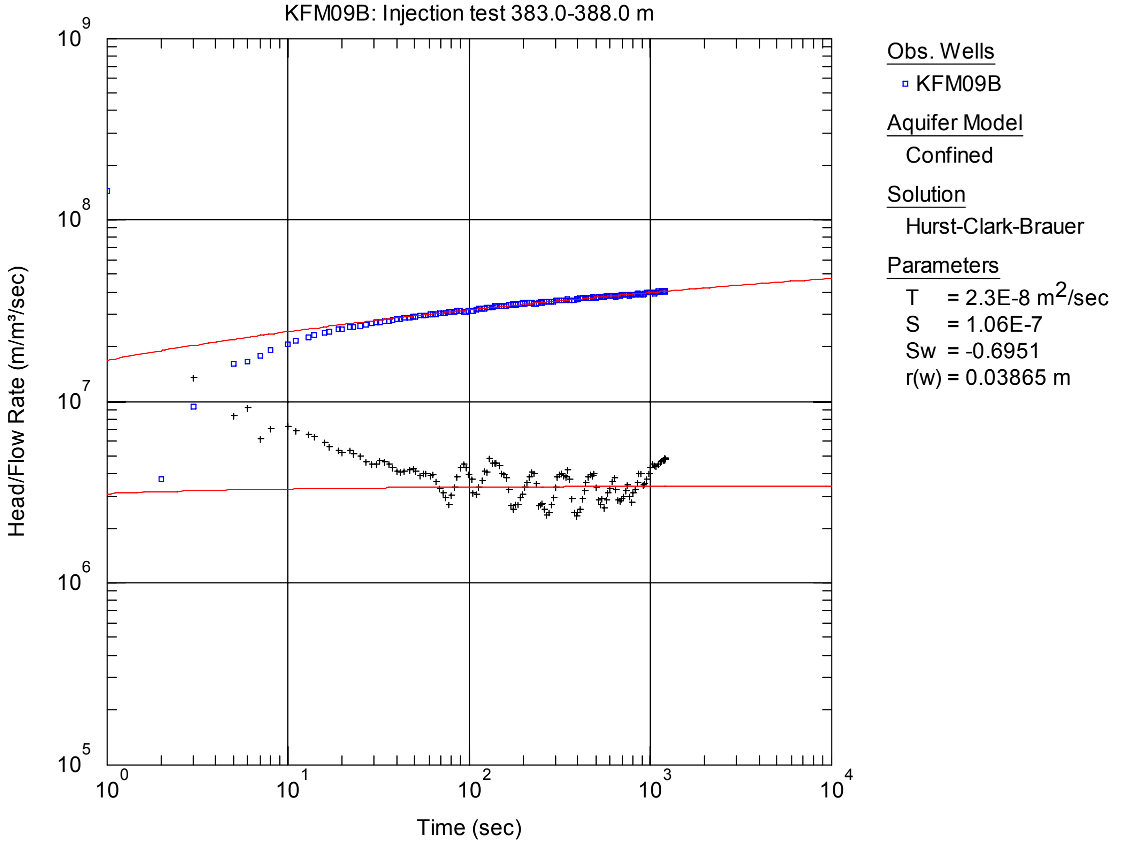


Figure A3-401. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 383.0-388.0 m in KFM09B.*

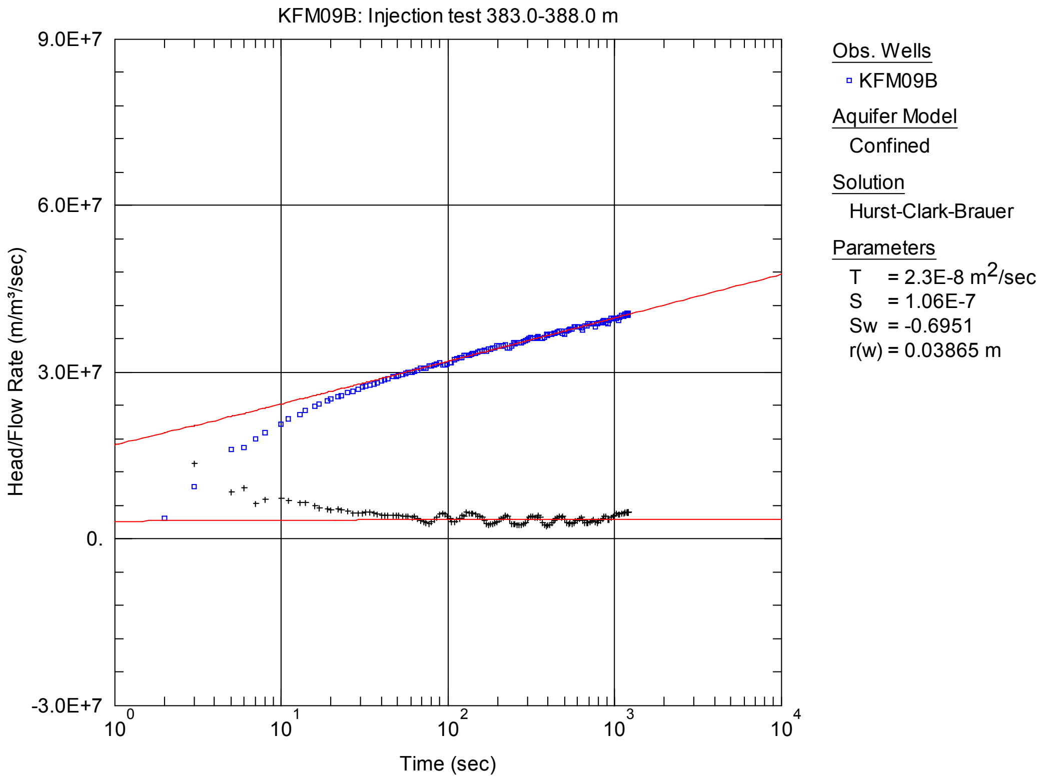


Figure A3-402. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 383.0-388.0 m in KFM09B.*

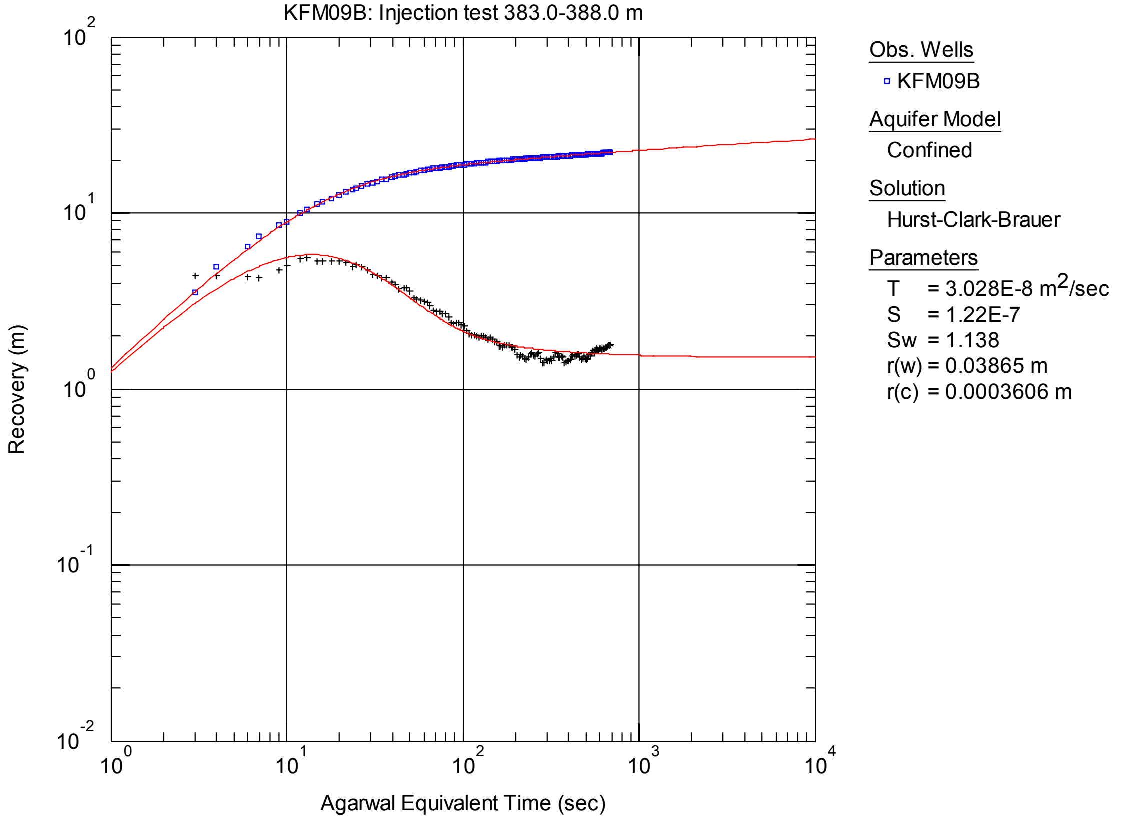


Figure A3-403. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 383.0-388.0 m in KFM09B.*

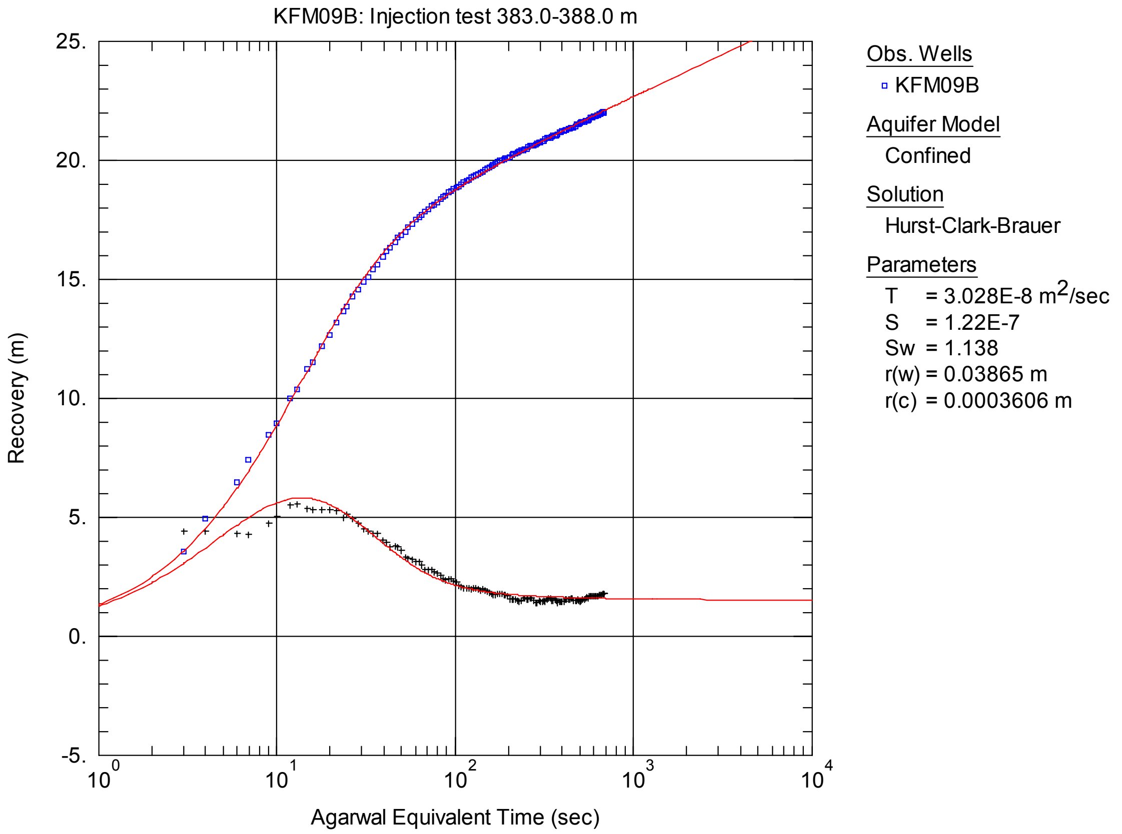


Figure A3-404. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 383.0-388.0 m in KFM09B.*

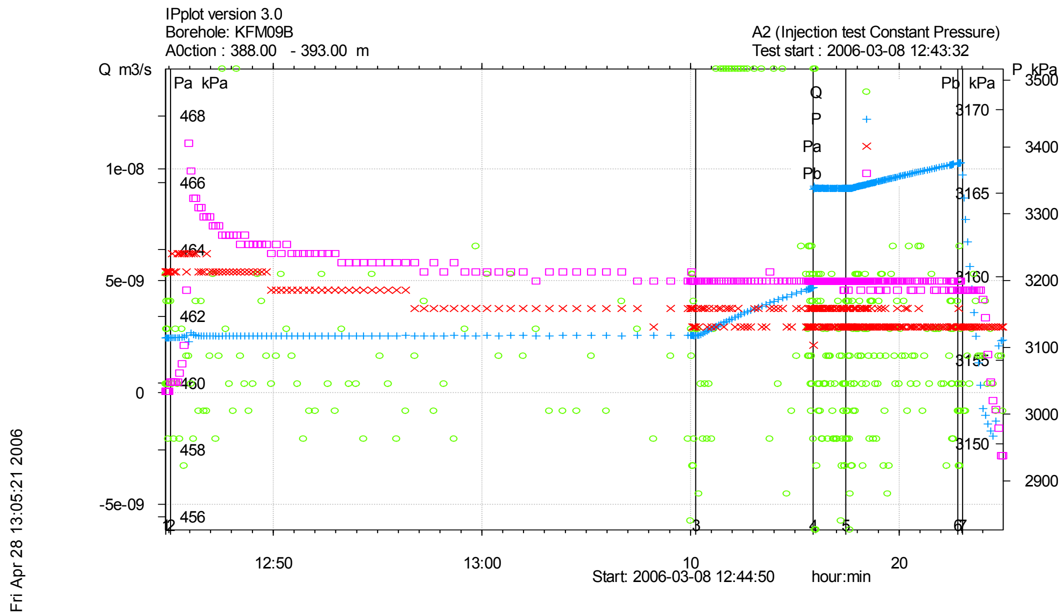


Figure A3-405. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 388.0-393.0 m in borehole KFM09B.*

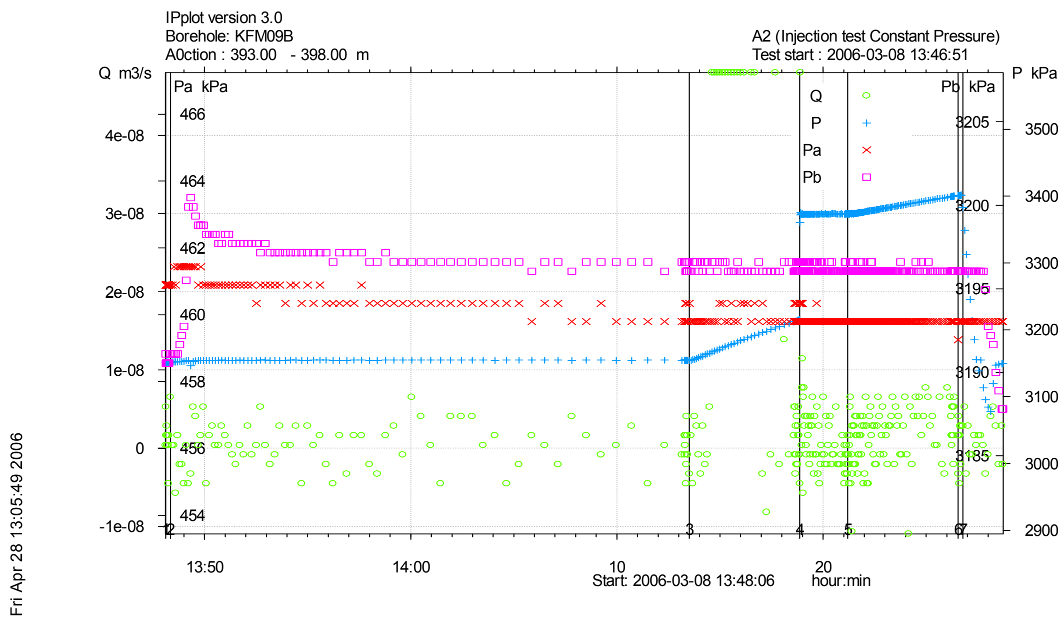


Figure A3-406. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 393.0-398.0 m in borehole KFM09B.*

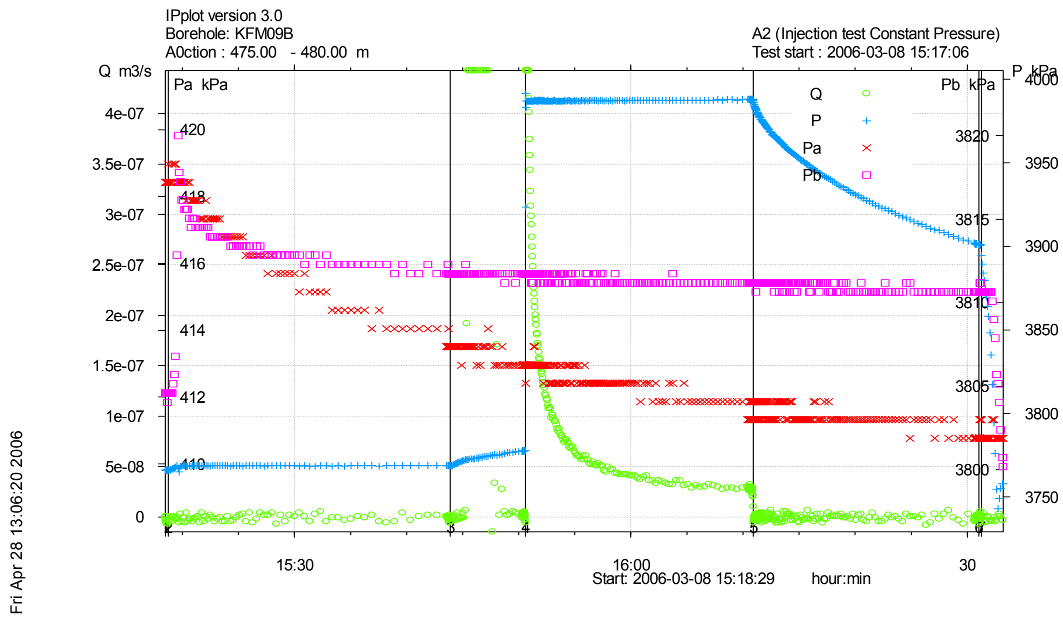


Figure A3-407. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 475.0-480.0 m in borehole KFM09B.*

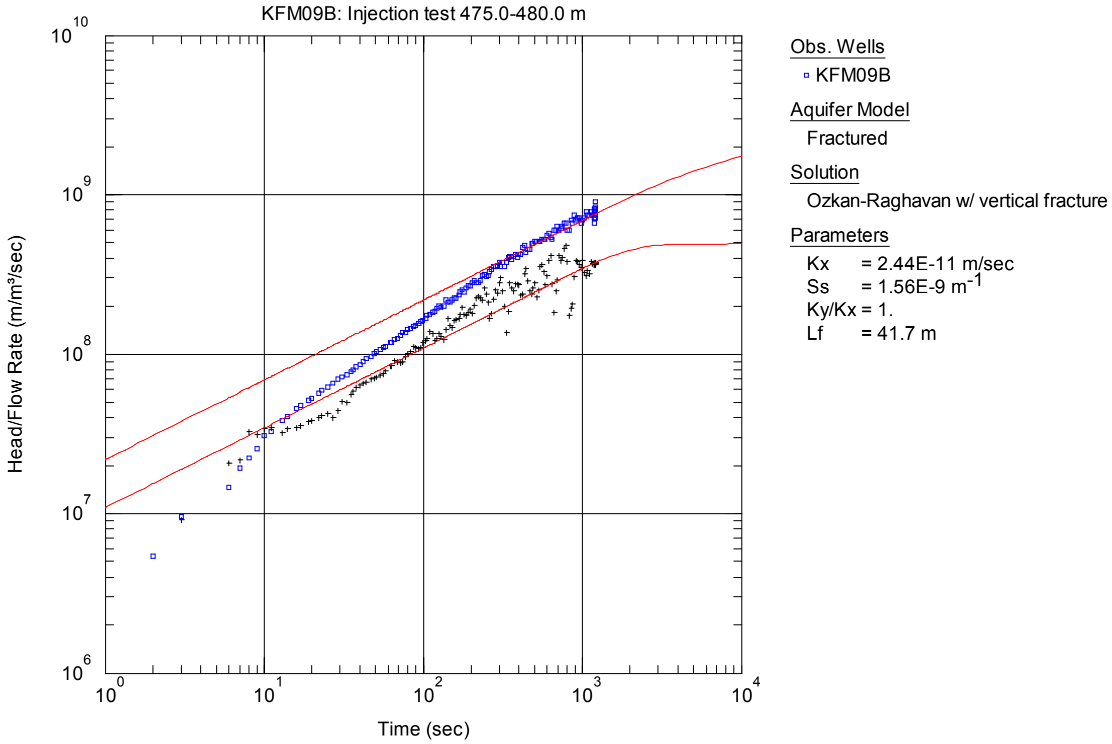


Figure A3-408. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 475.0-480.0 m in KFM09B.*

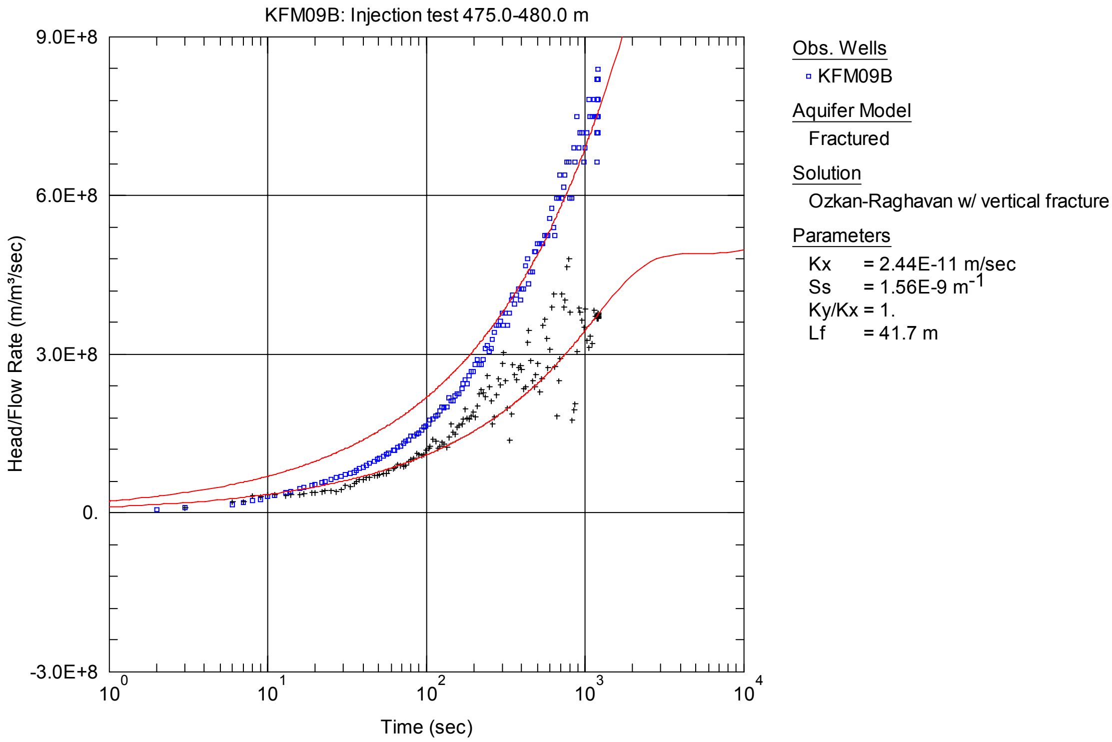


Figure A3-409. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 475.0-480.0 m in KFM09B.*

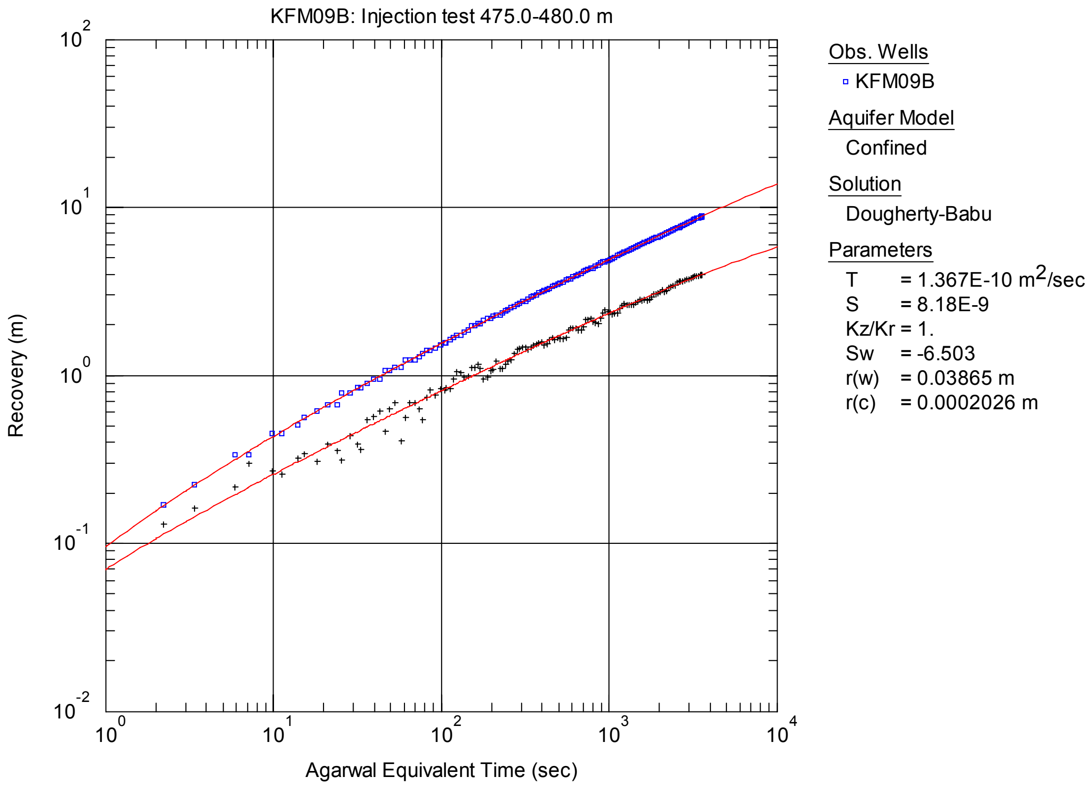


Figure A3-410. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Dougherty-Babu solution, from the injection test in section 475.0-480.0 m in KFM09B.*

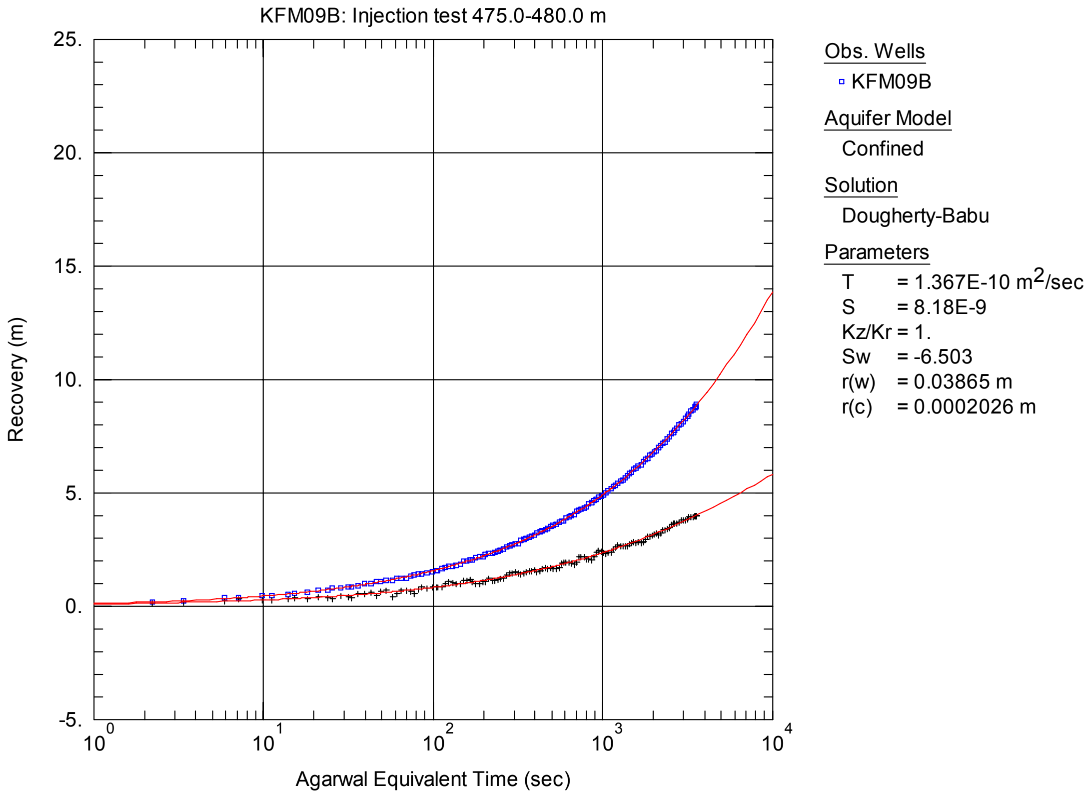


Figure A3-411. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Dougherty-Babu solution, from the injection test in section 475.0-480.0 m in KFM09B.*

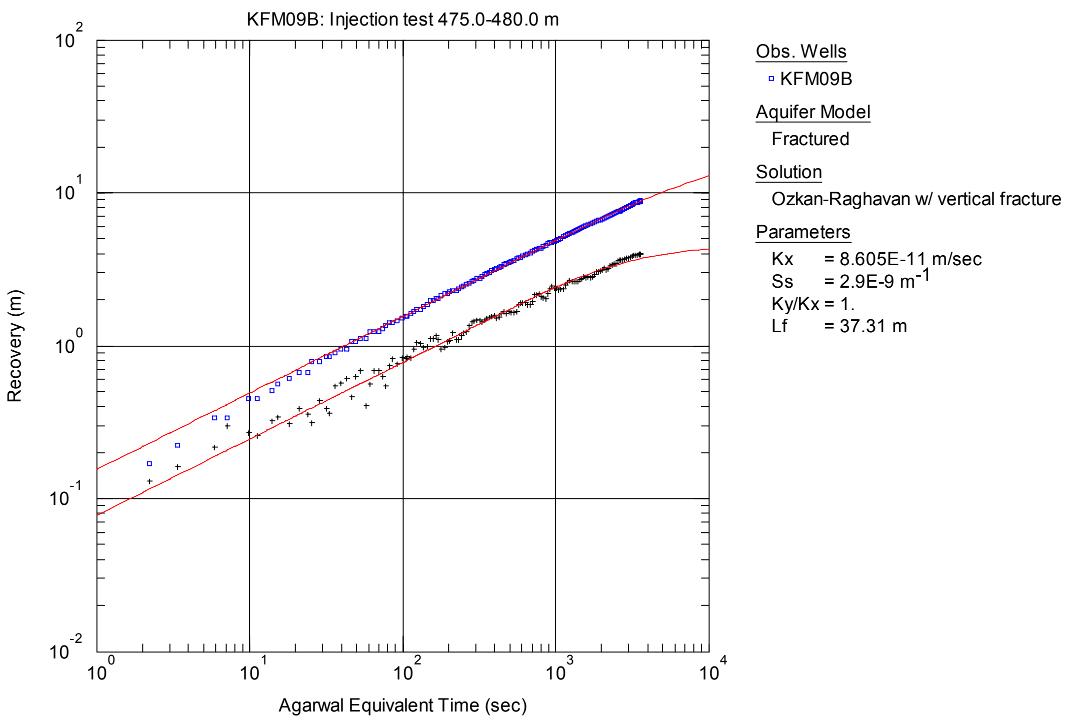


Figure A3-412. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 475.0-480.0 m in KFM09B.*

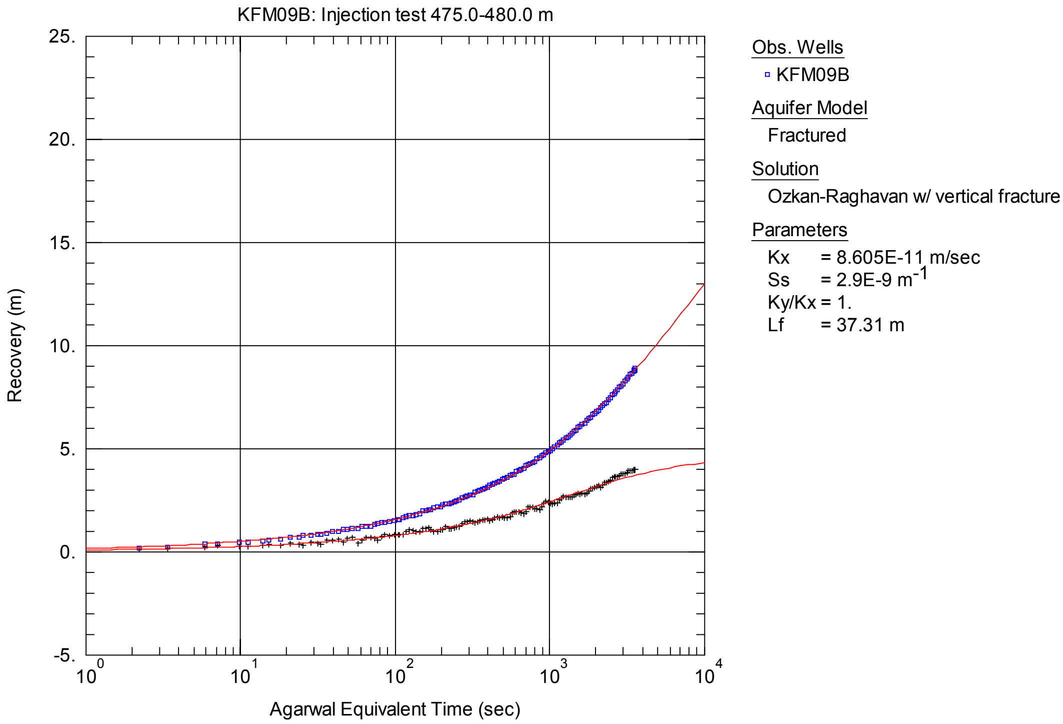


Figure A3-413. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, showing fit to the Ozkan-Raghavan solution, from the injection test in section 475.0-480.0 m in KFM09B.*

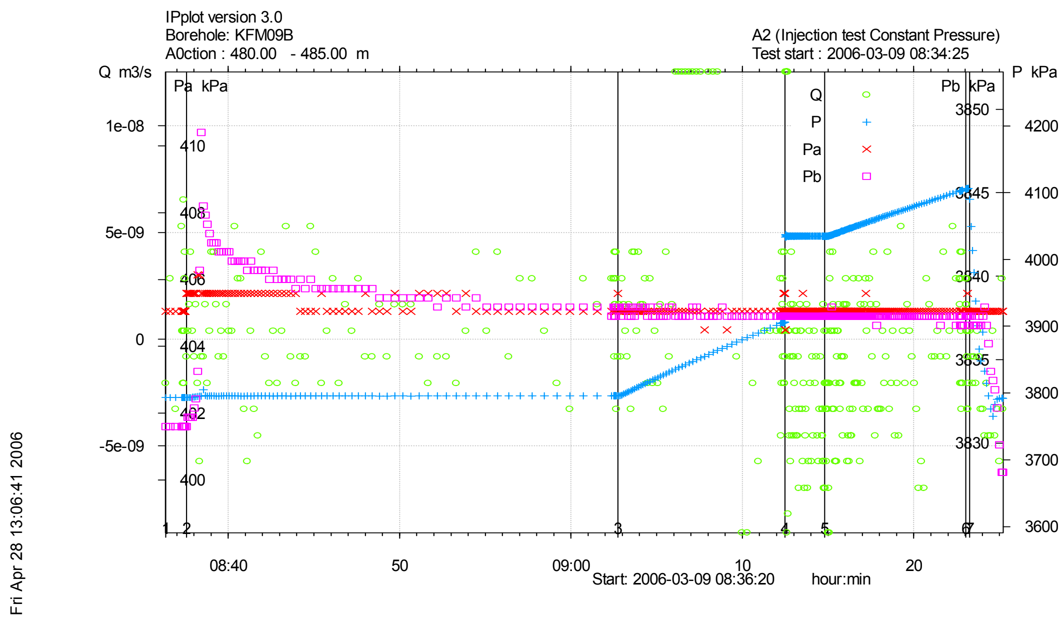


Figure A3-414. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 480.0-485.0 m in borehole KFM09B.*

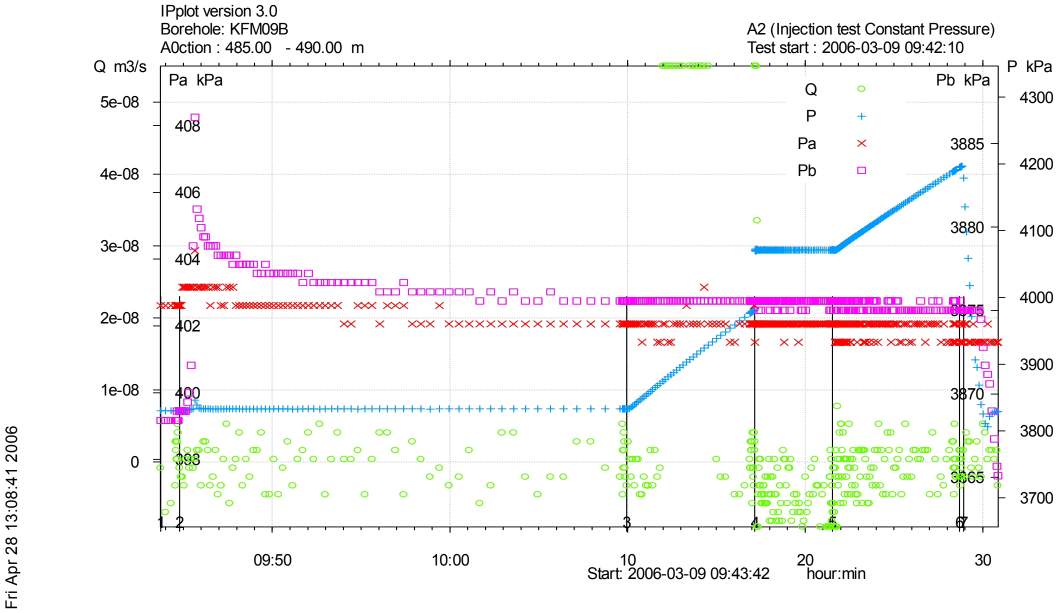


Figure A3-415. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 485.0-490.0 m in borehole KFM09B.*

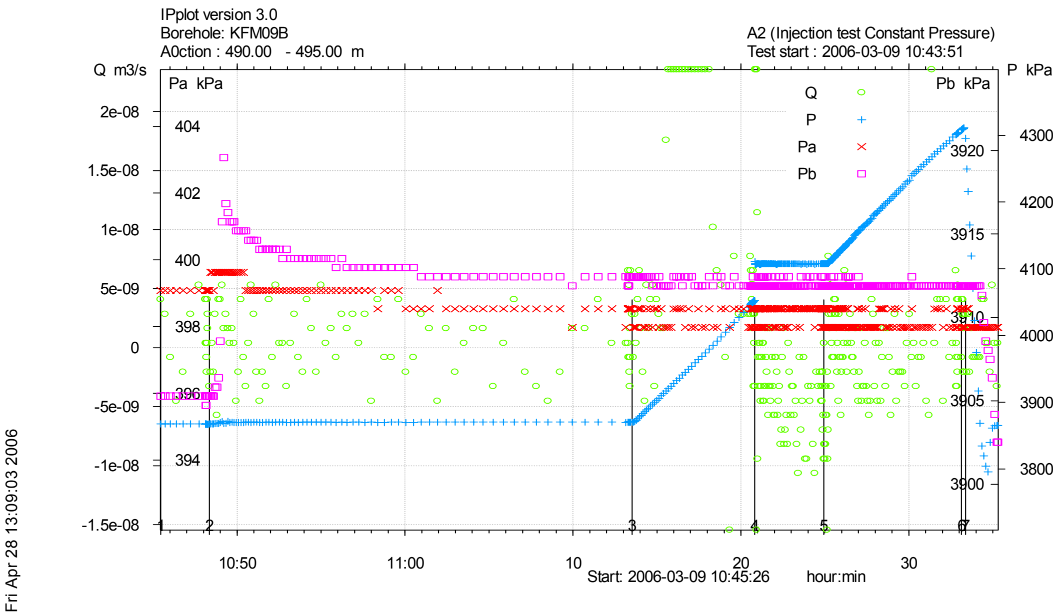


Figure A3-416. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 490.0-495.0 m in borehole KFM09B.*

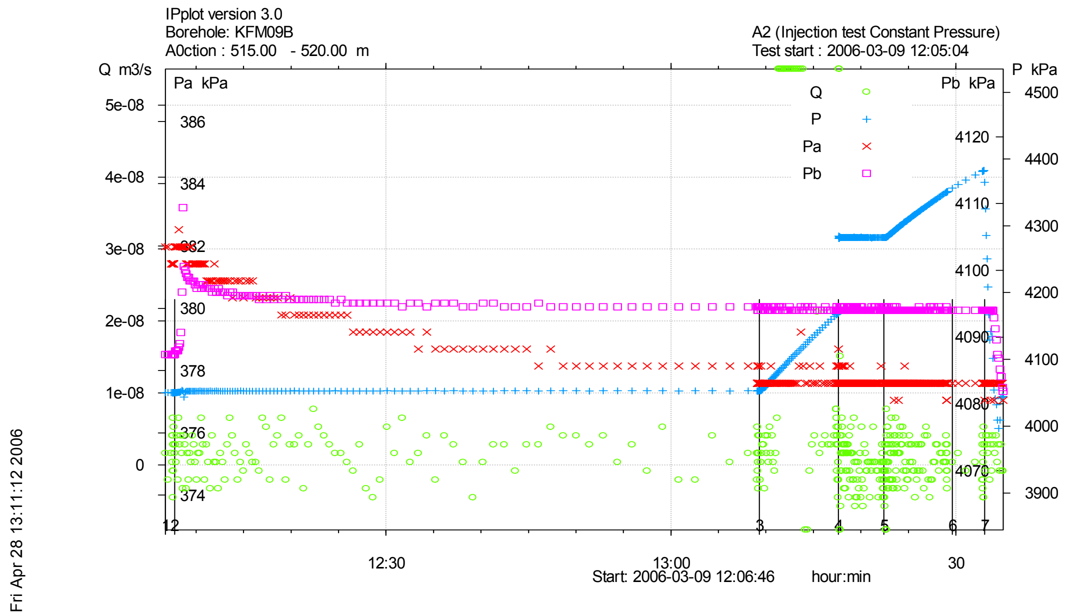


Figure A3-417. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 515.0-520.0 m in borehole KFM09B.*

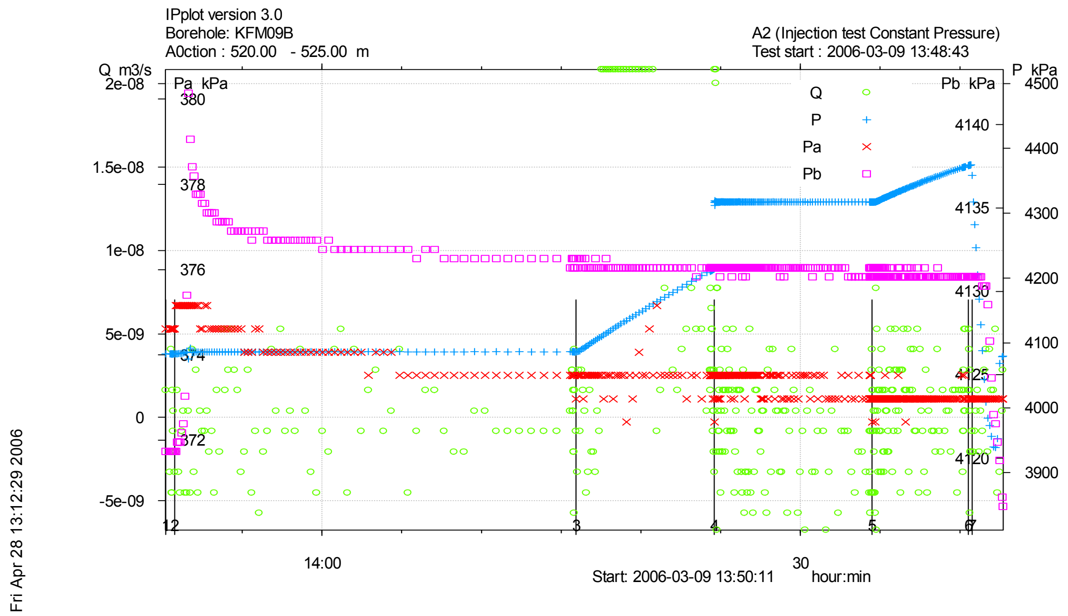


Figure A3-418. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 520.0-525.0 m in borehole KFM09B.*

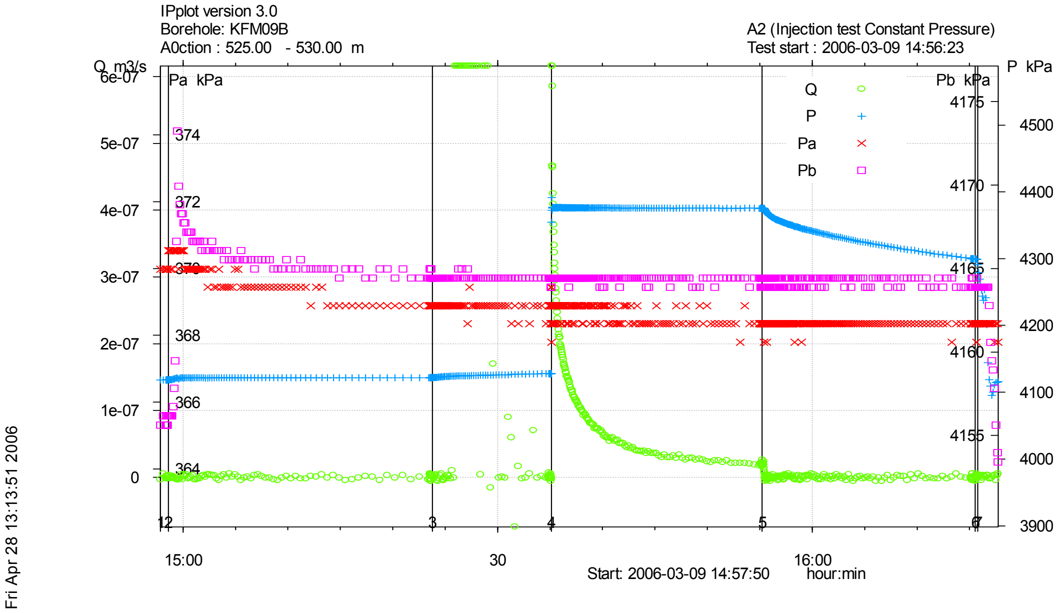


Figure A3-419. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 525.0-530.0 m in borehole KFM09B.*

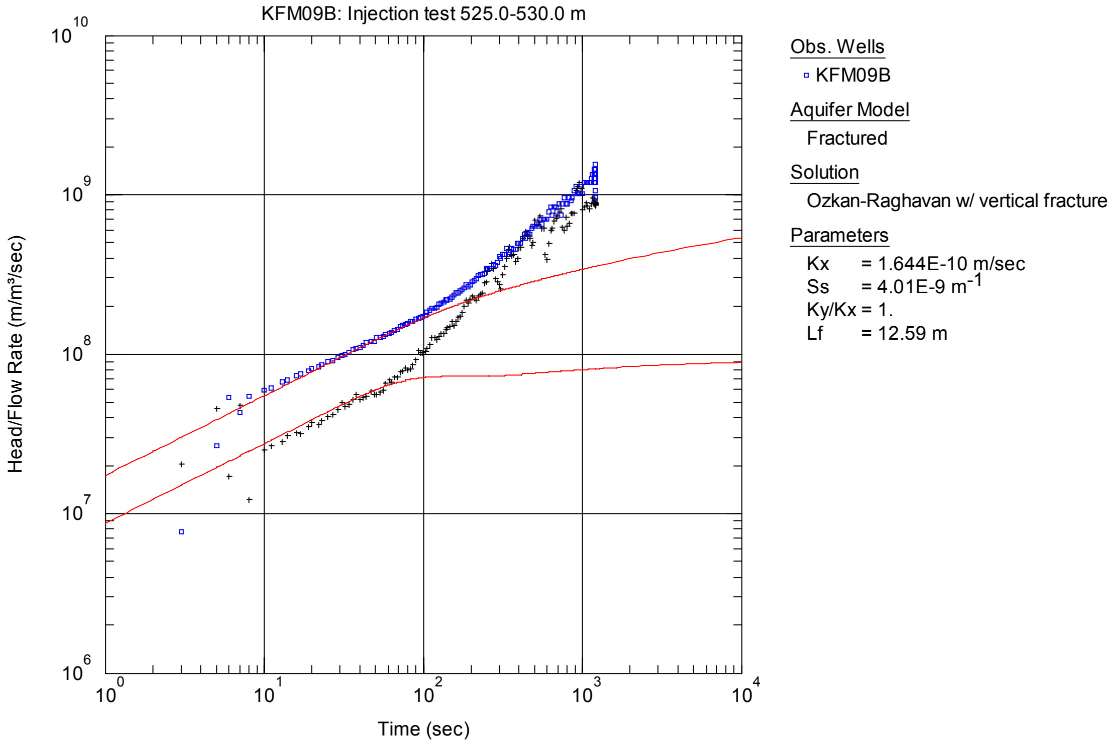


Figure A3-420. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 525.0-530.0 m in KFM09B.*

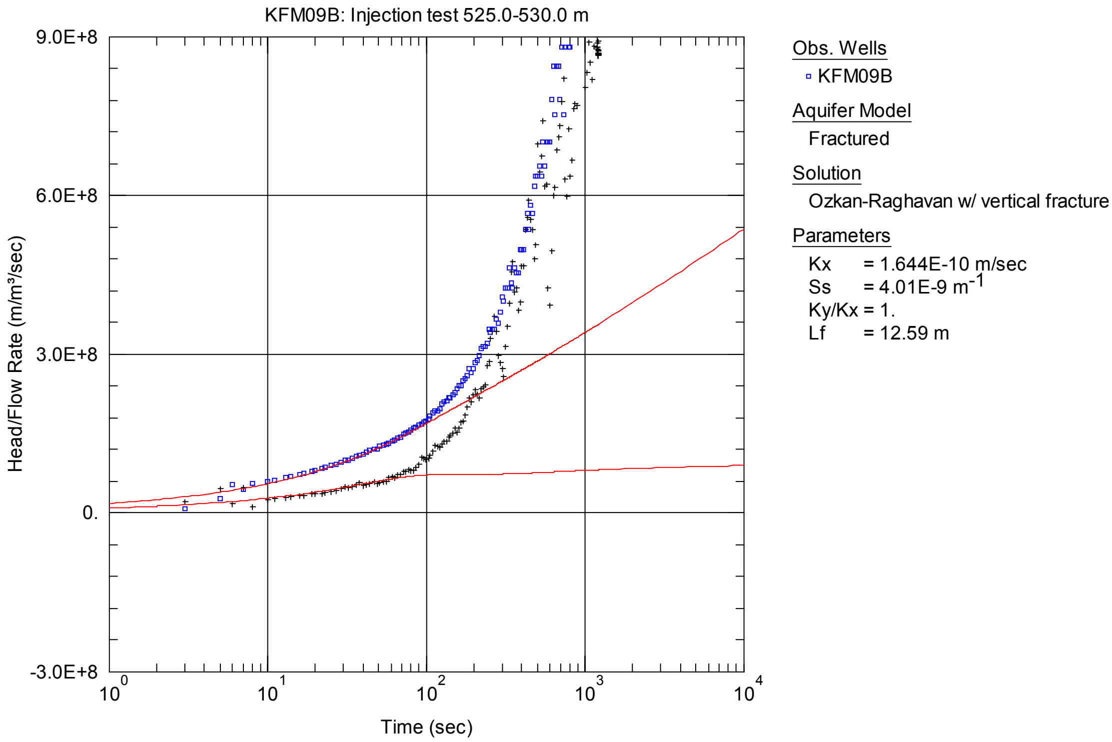


Figure A3-421. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 525.0-530.0 m in KFM09B.*

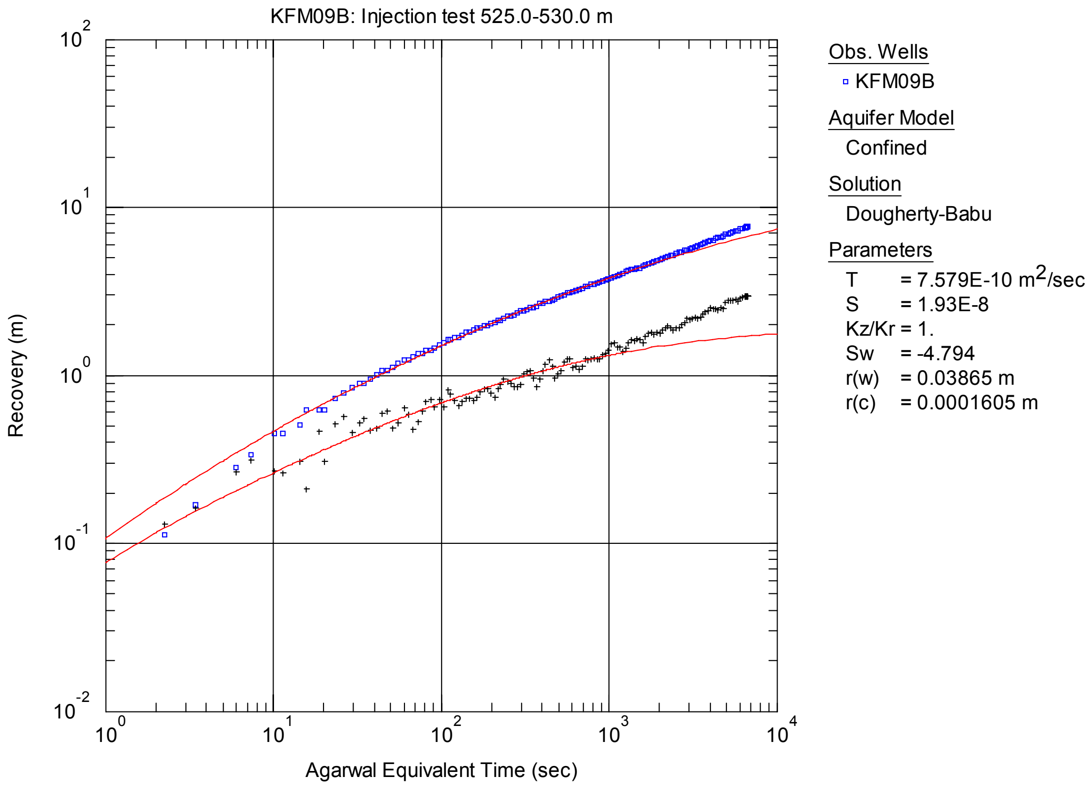


Figure A3-422. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 525.0-530.0 m in KFM09B.*

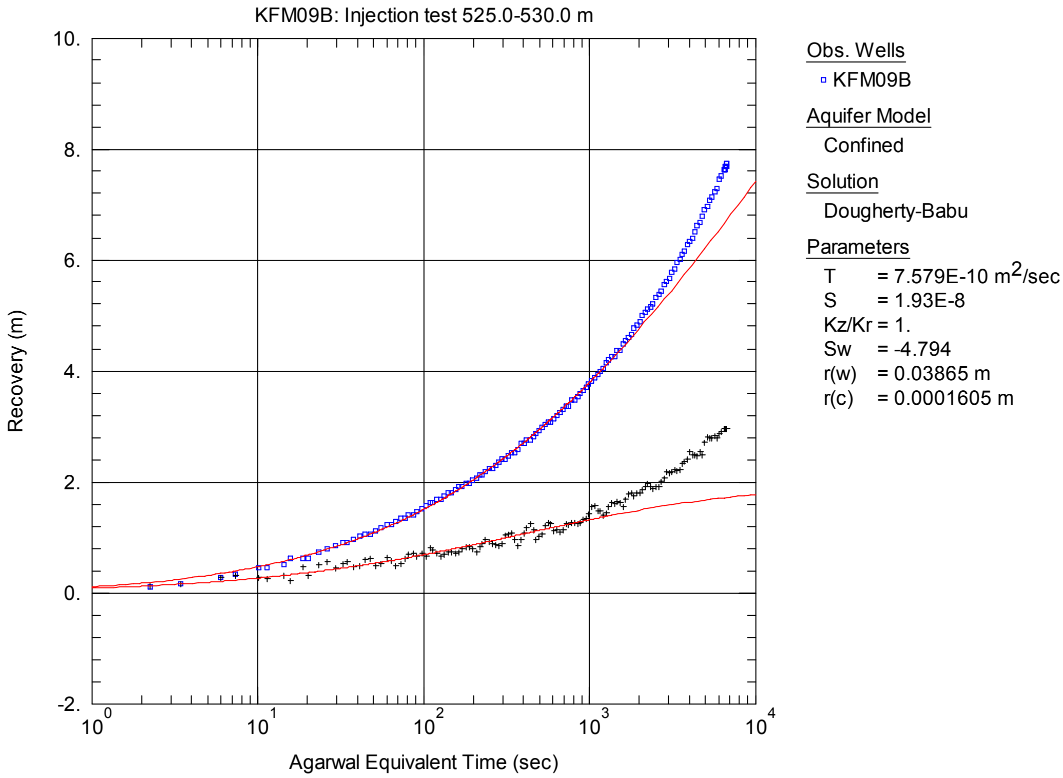


***Figure A3-423.** Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 525.0-530.0 m in KFM09B.*

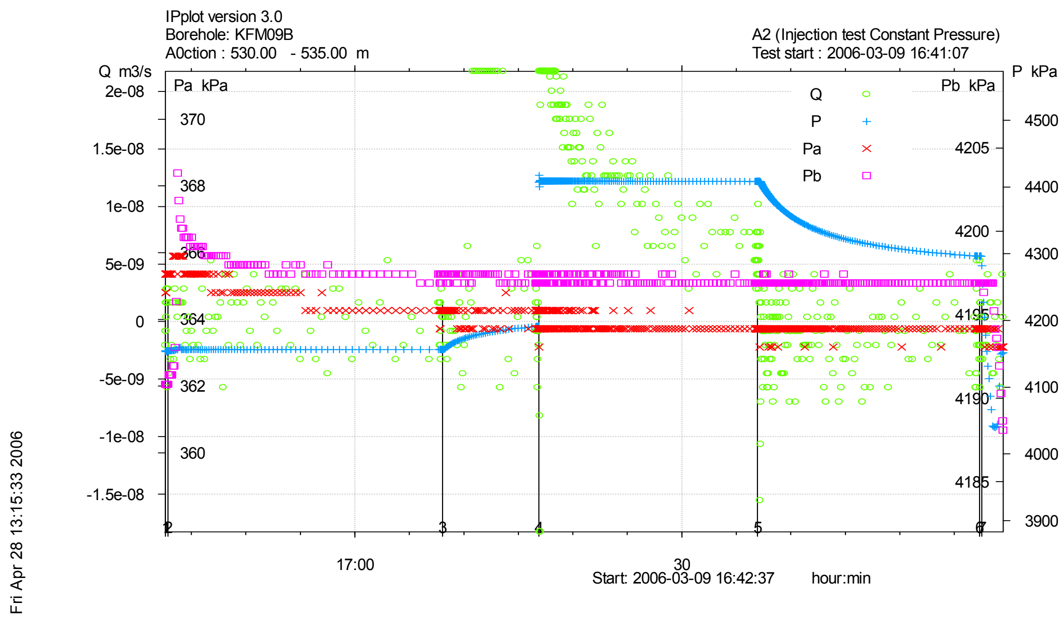


***Figure A3-424.** Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 530.0-535.0 m in borehole KFM09B.*

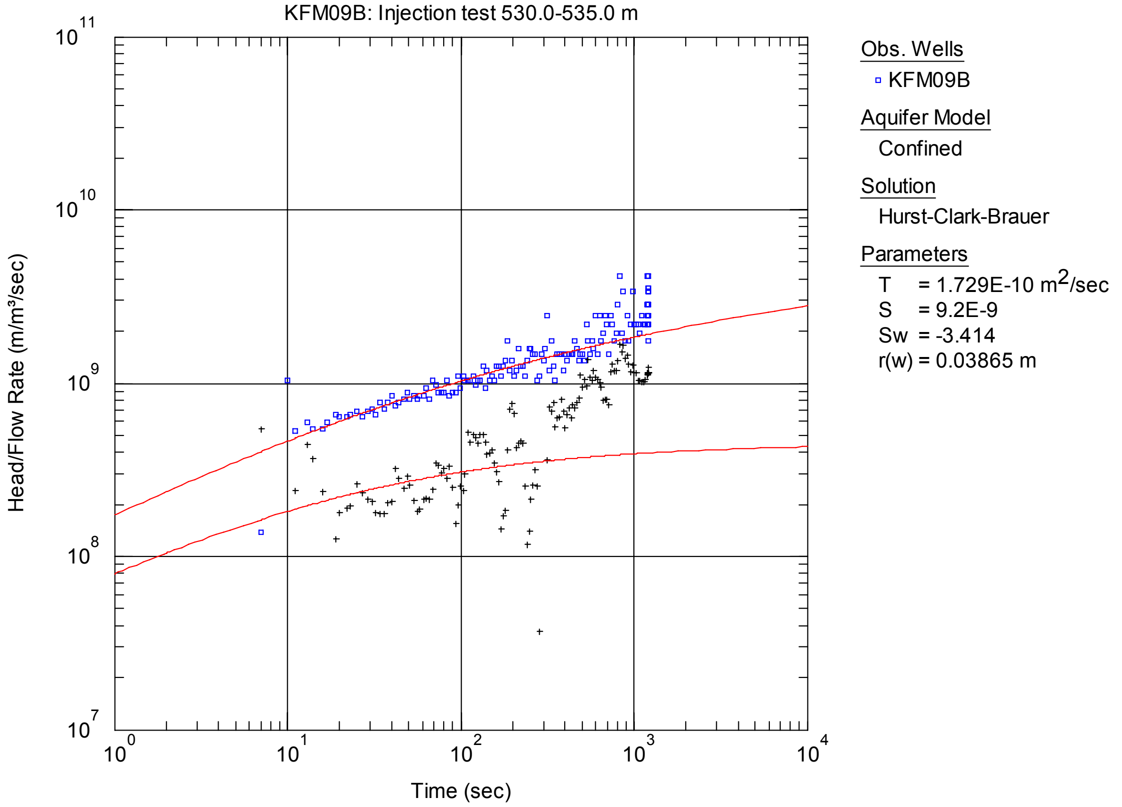


Figure A3-425. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 530.0-535.0 m in KFM09B.*

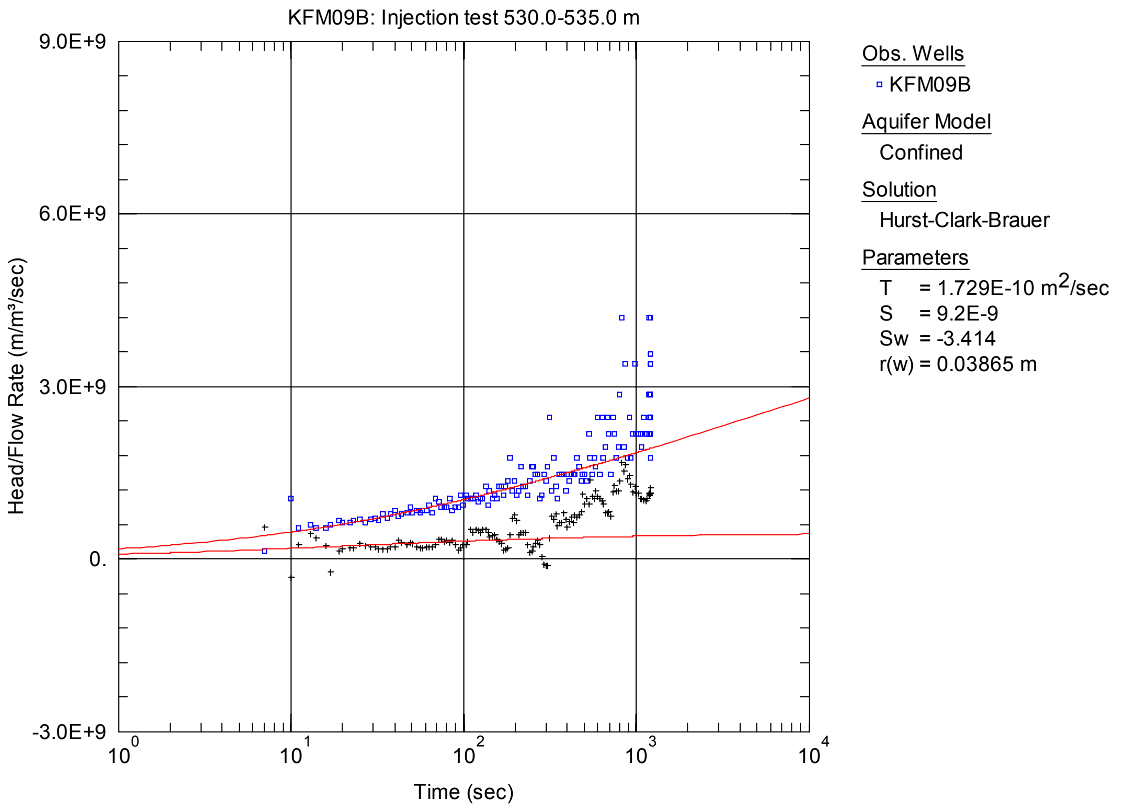


Figure A3-426. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 530.0-535.0 m in KFM09B.*

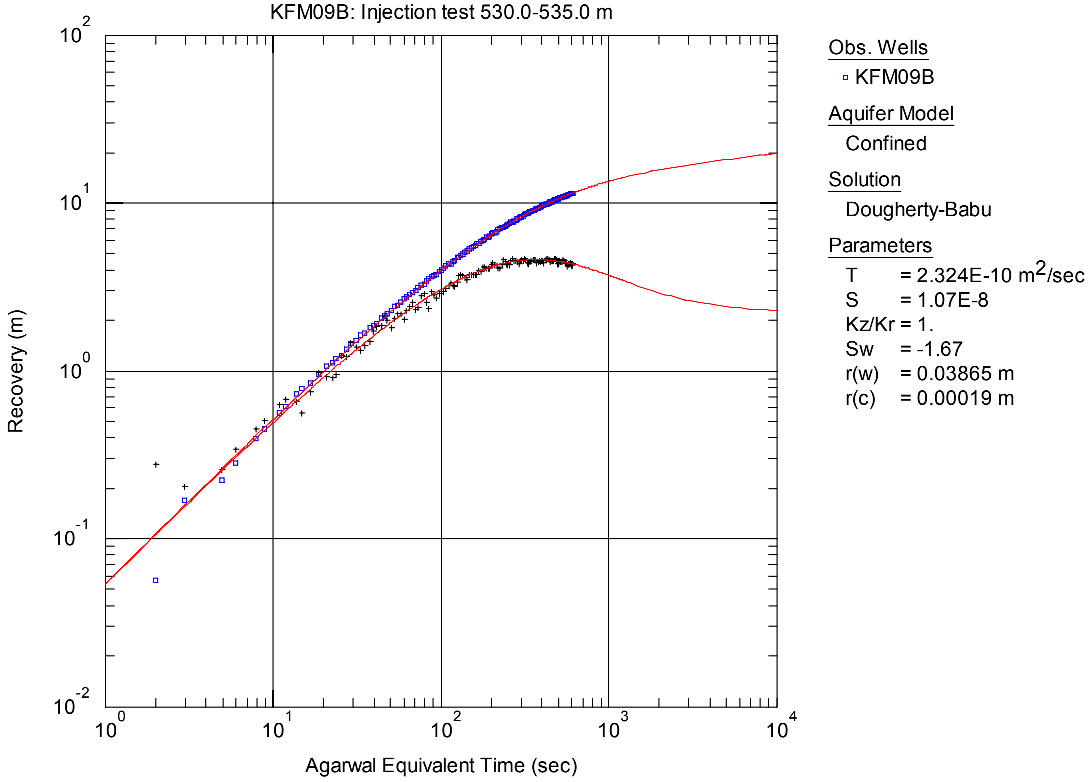


Figure A3-427. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 530.0-535.0 m in KFM09B.*

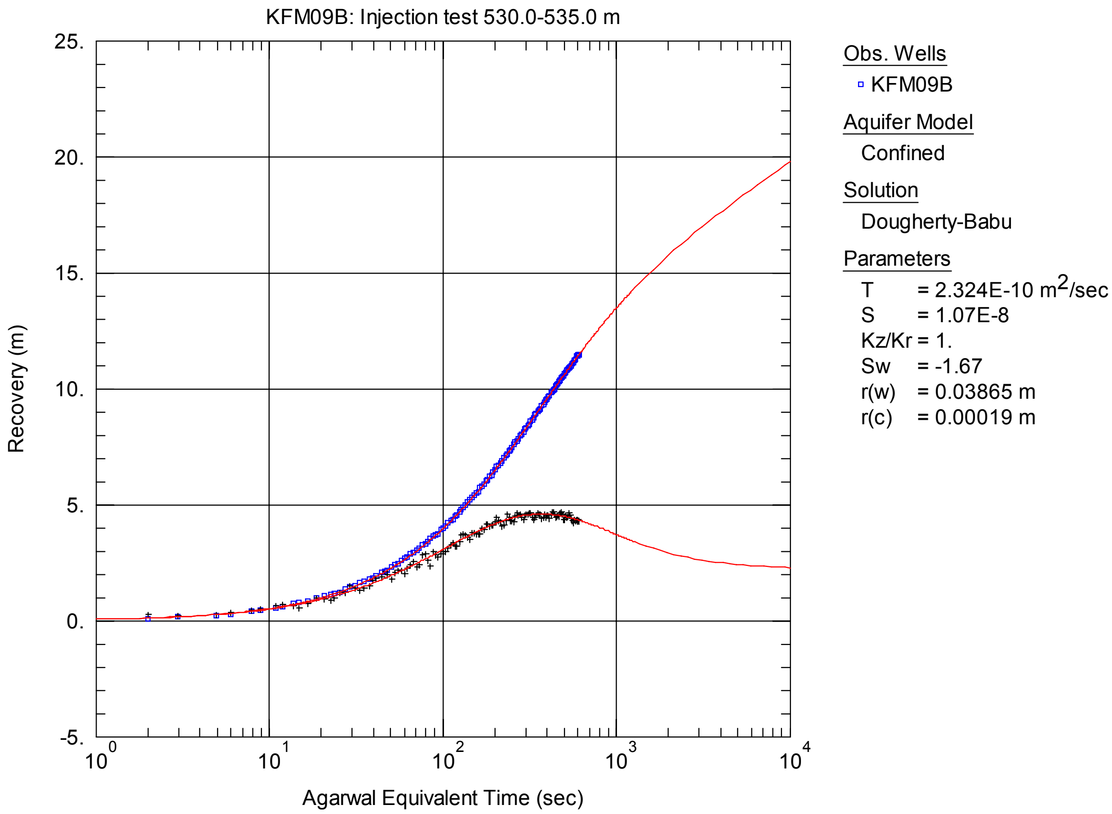


Figure A3-428. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 530.0-535.0 m in KFM09B.*

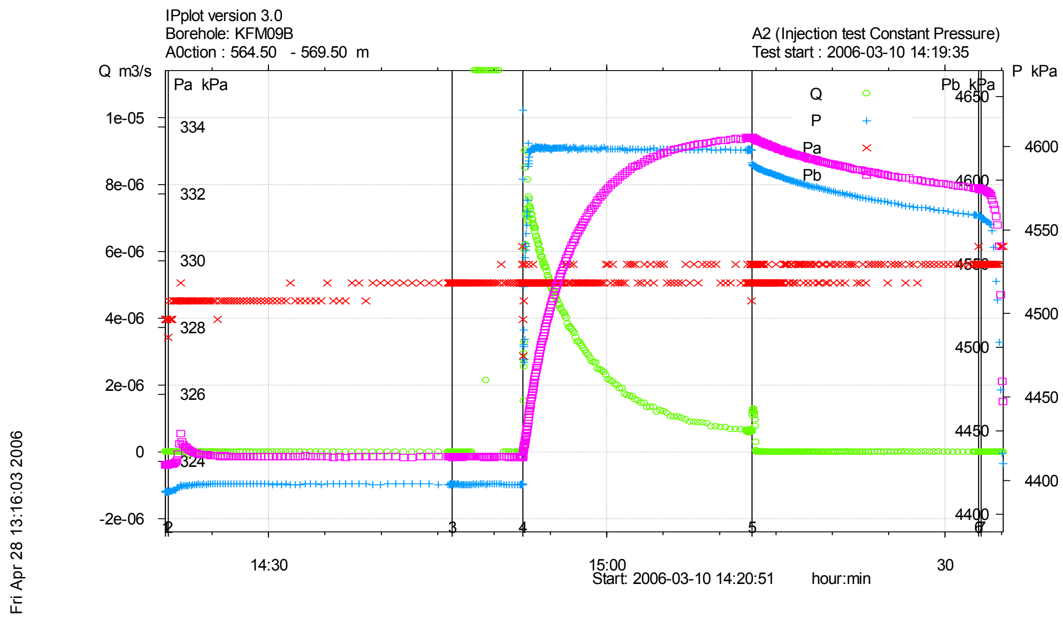


Figure A3-429. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 564.5-569.5 m in borehole KFM09B.*

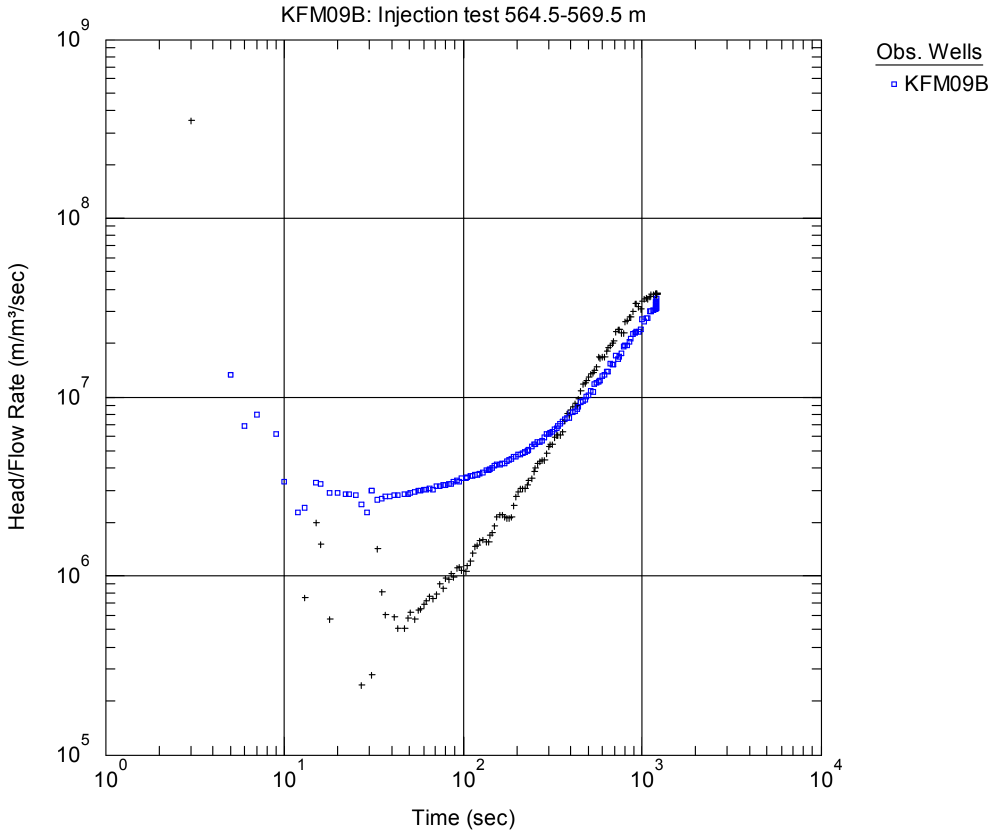


Figure A3-430. *Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 564.5-569.5 m in KFM09B.*

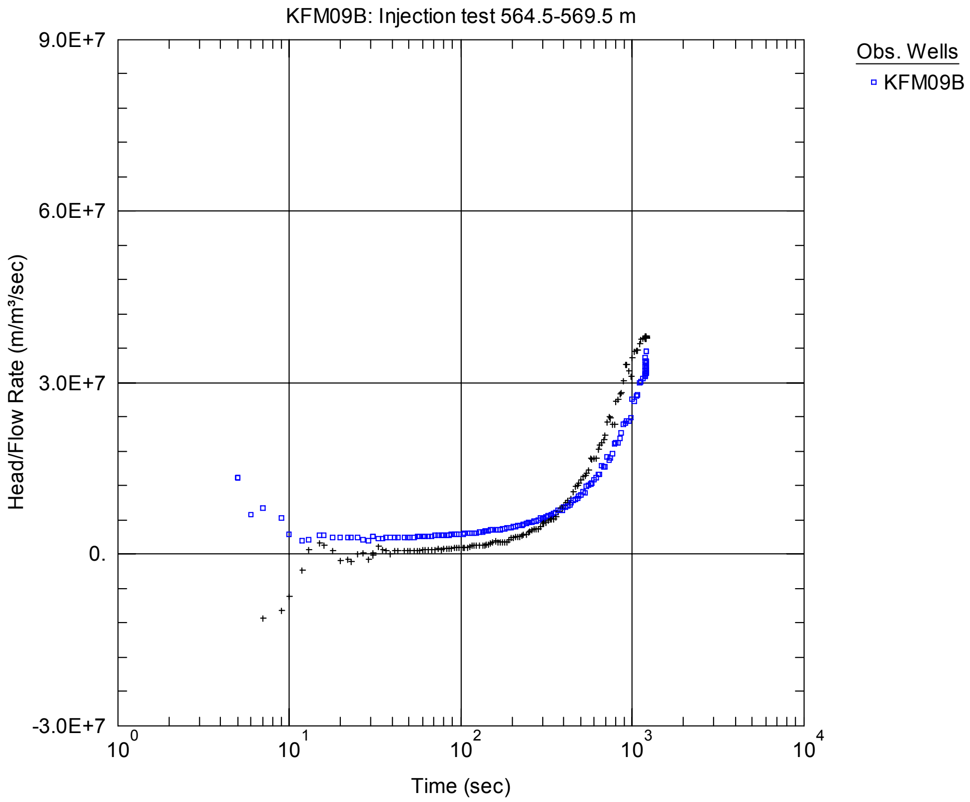


Figure A3-431. *Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 564.5-569.5 m in KFM09B.*

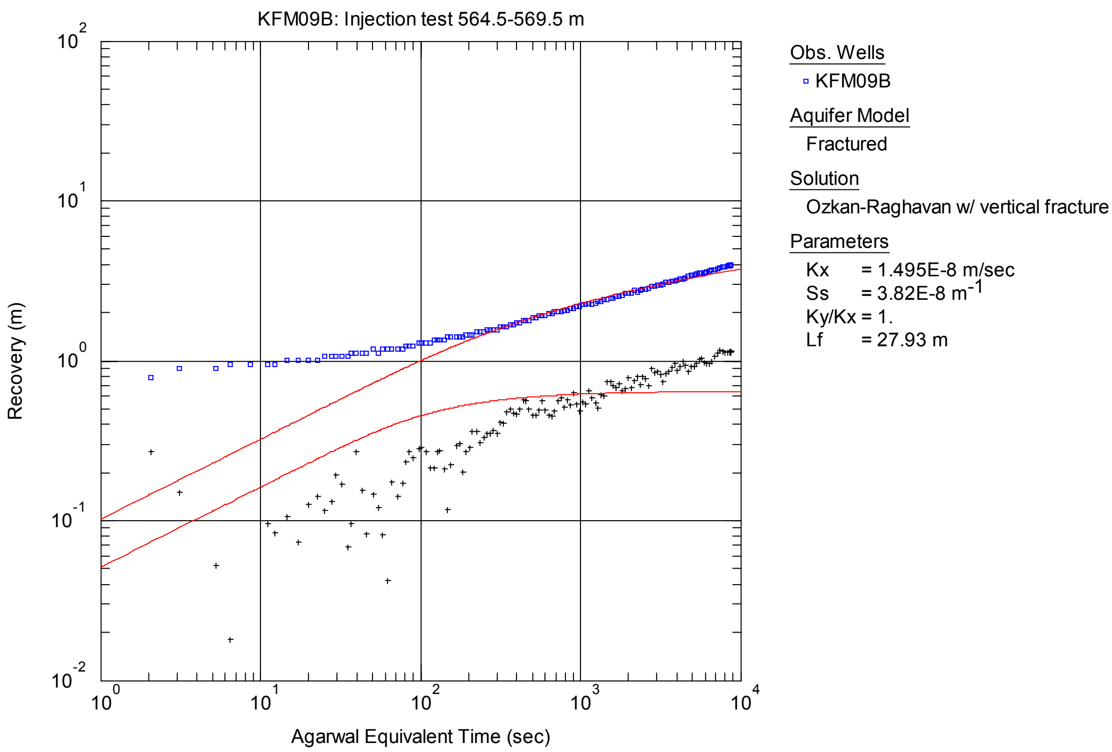


Figure A3-432. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 564.5-569.5 m in KFM09B.*

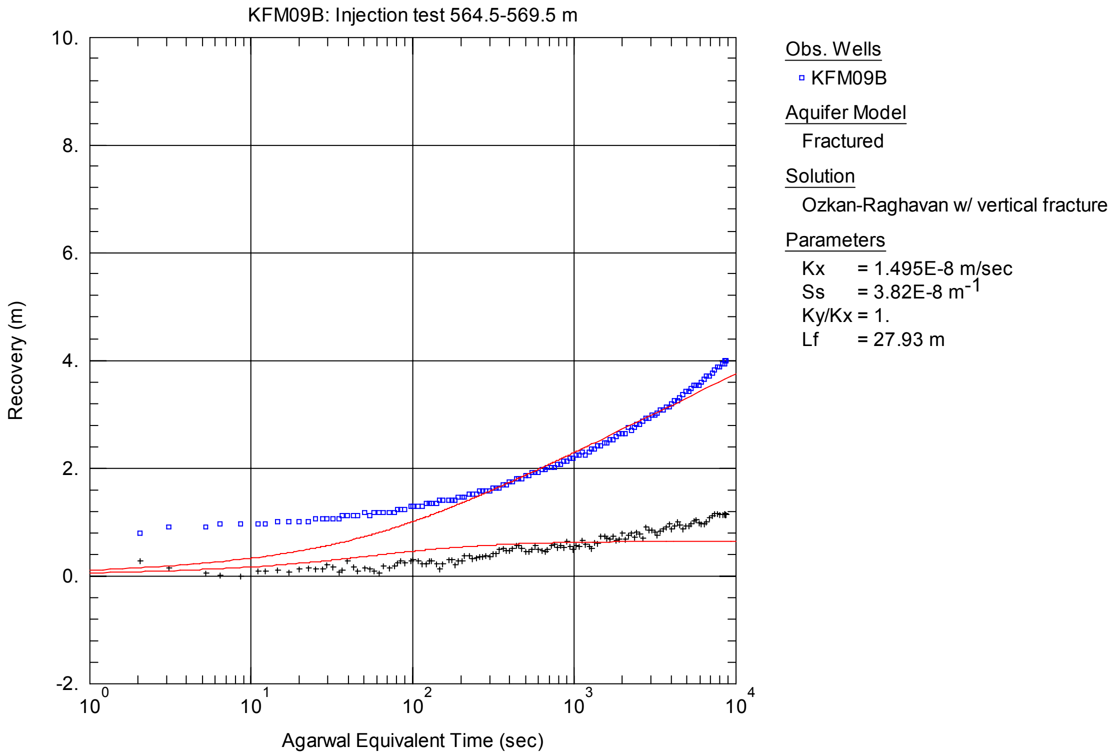


Figure A3-433. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 564.5-569.5 m in KFM09B.*

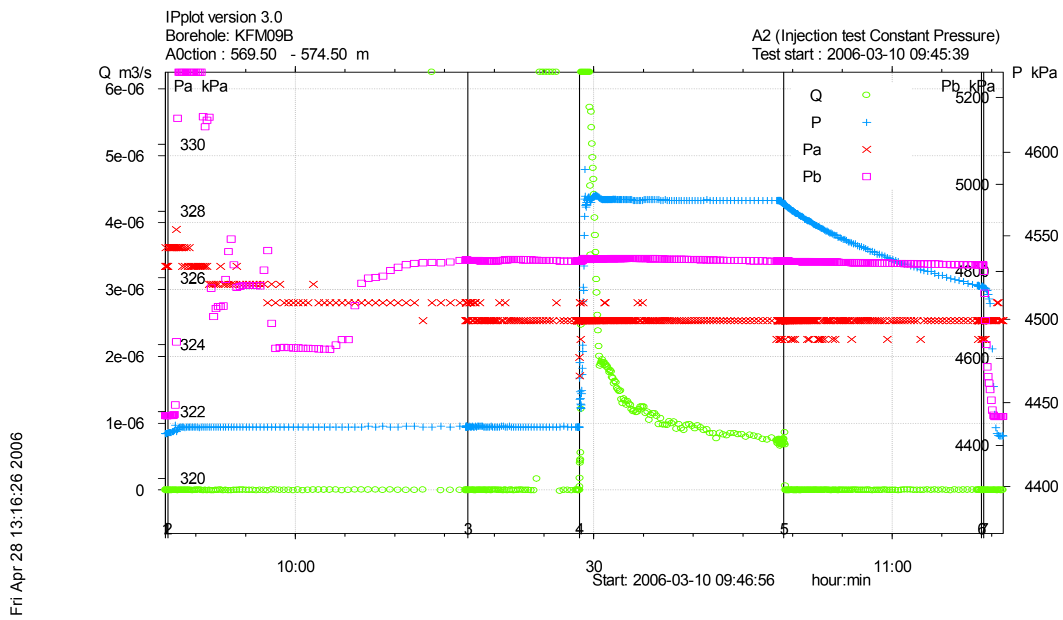


Figure A3-434. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 569.5-574.5 m in borehole KFM09B.*

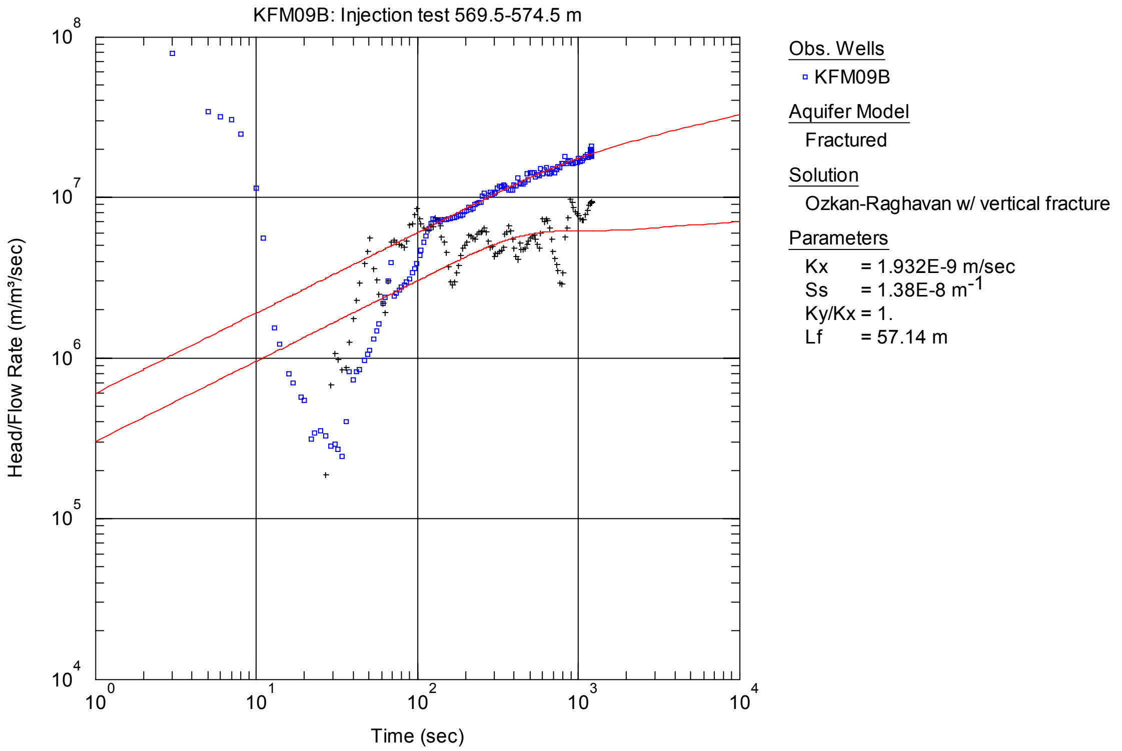


***Figure A3-435.** Log-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 569.5-574.5 m in KFM09B.*

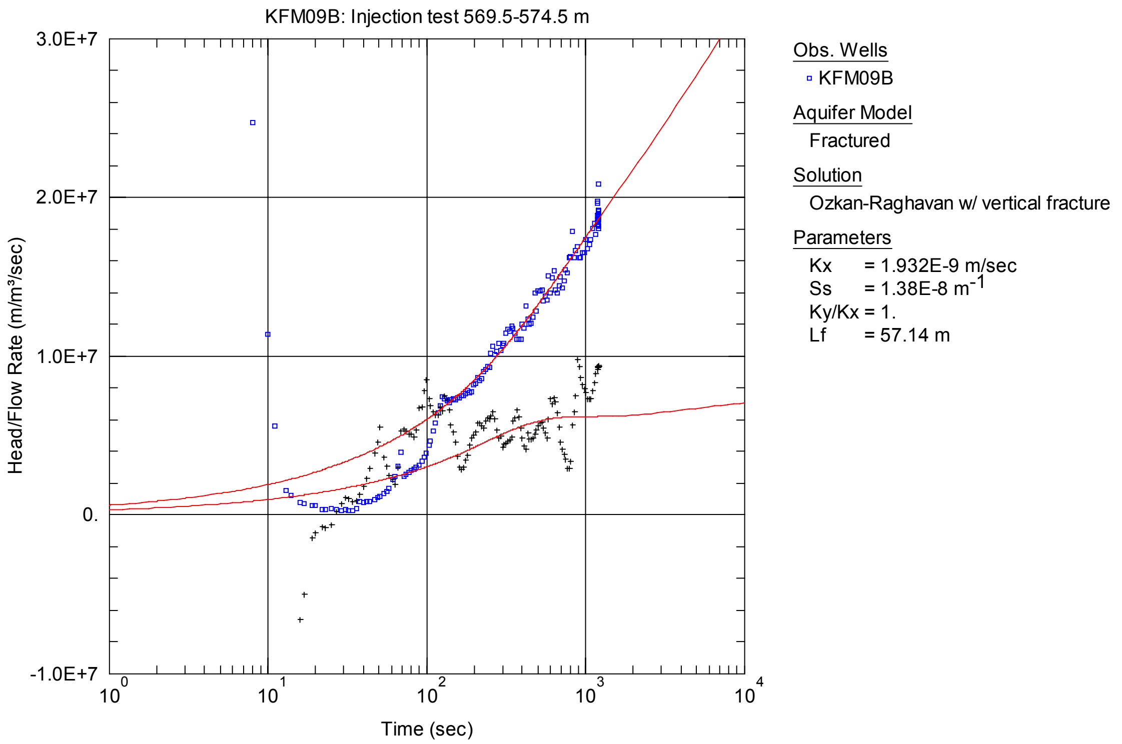


***Figure A3-436.** Lin-log plot of head/flow rate (□) and derivative (+) versus time, from the injection test in section 569.5-574.5 m in KFM09B.*

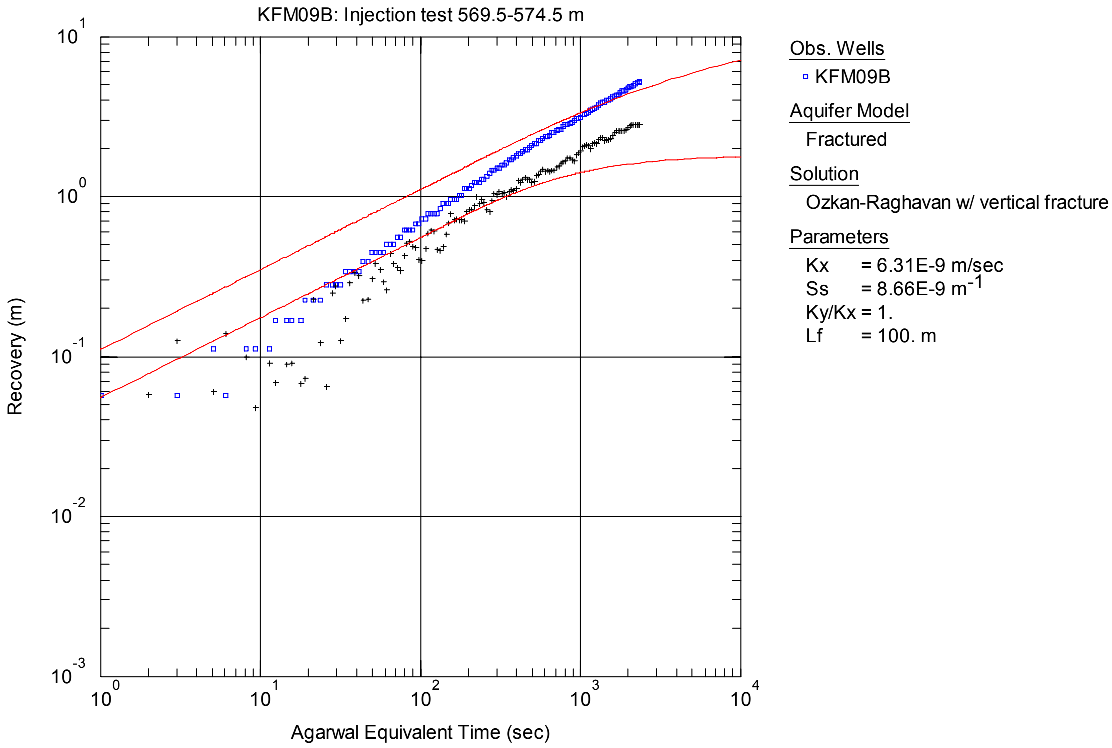


Figure A3-437. *Log-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 569.5-574.5 m in KFM09B.*

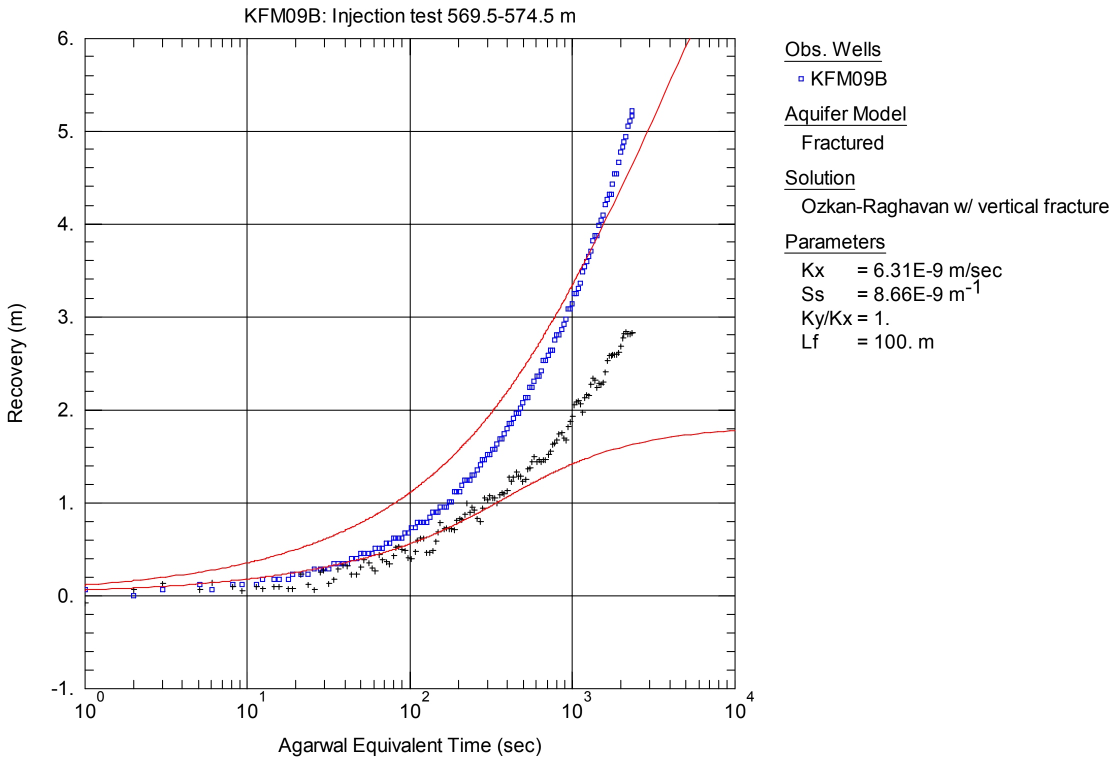


Figure A3-438. *Lin-log plot of recovery (□) and derivative (+) versus equivalent time, from the injection test in section 569.5-574.5 m in KFM09B.*

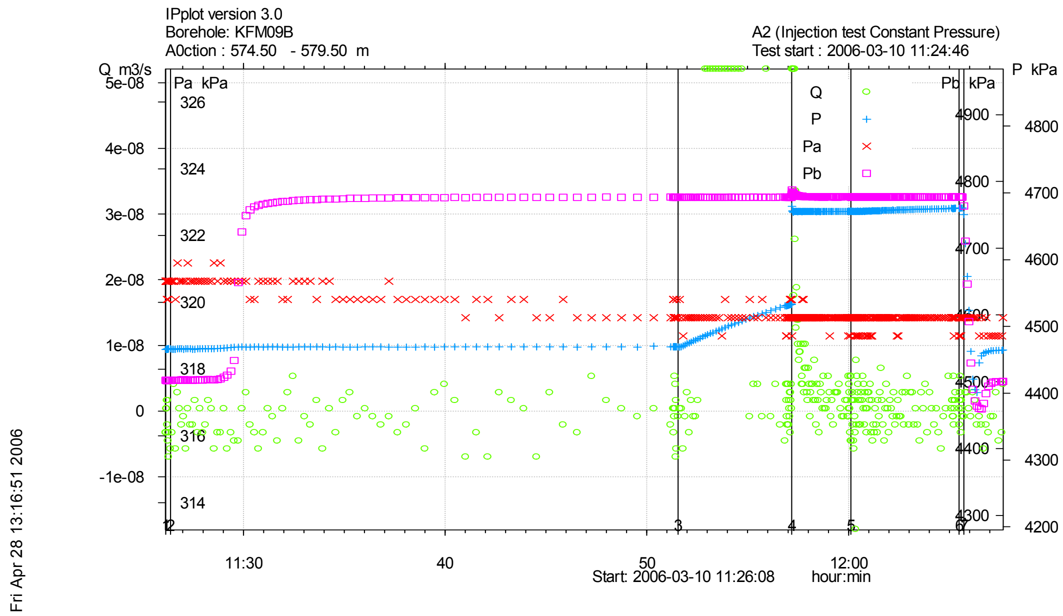


Figure A3-439. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 574.5-579.5 m in borehole KFM09B.*

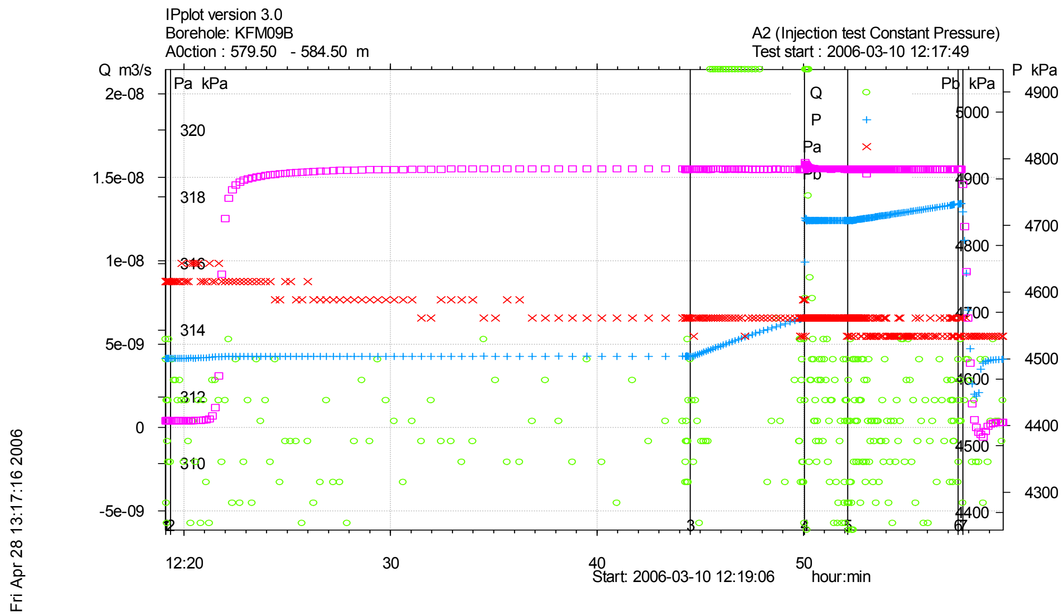


Figure A3-440. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 579.5-584.5 m in borehole KFM09B.*

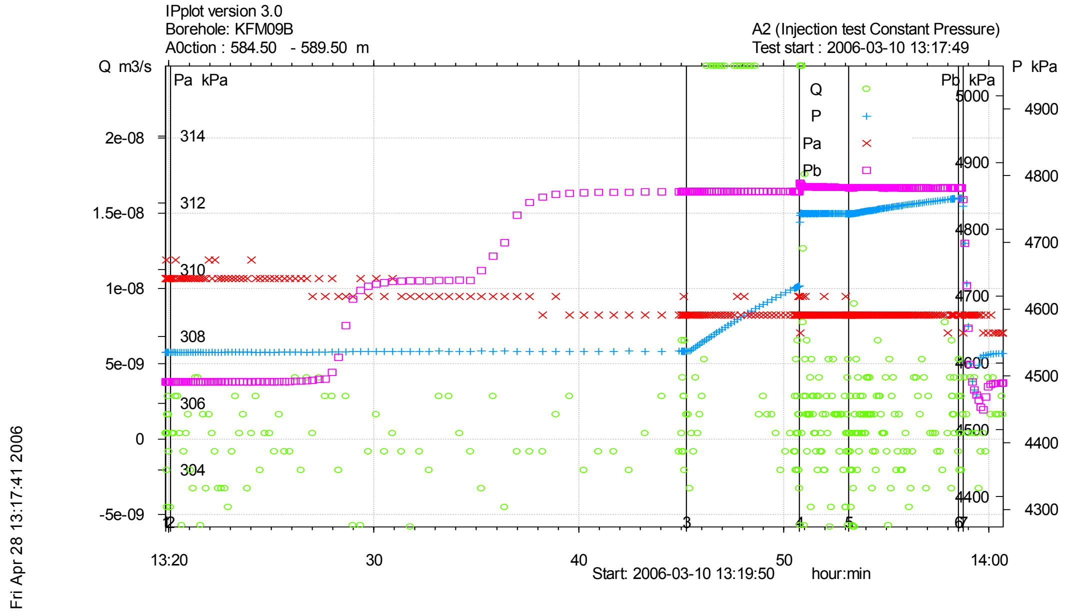
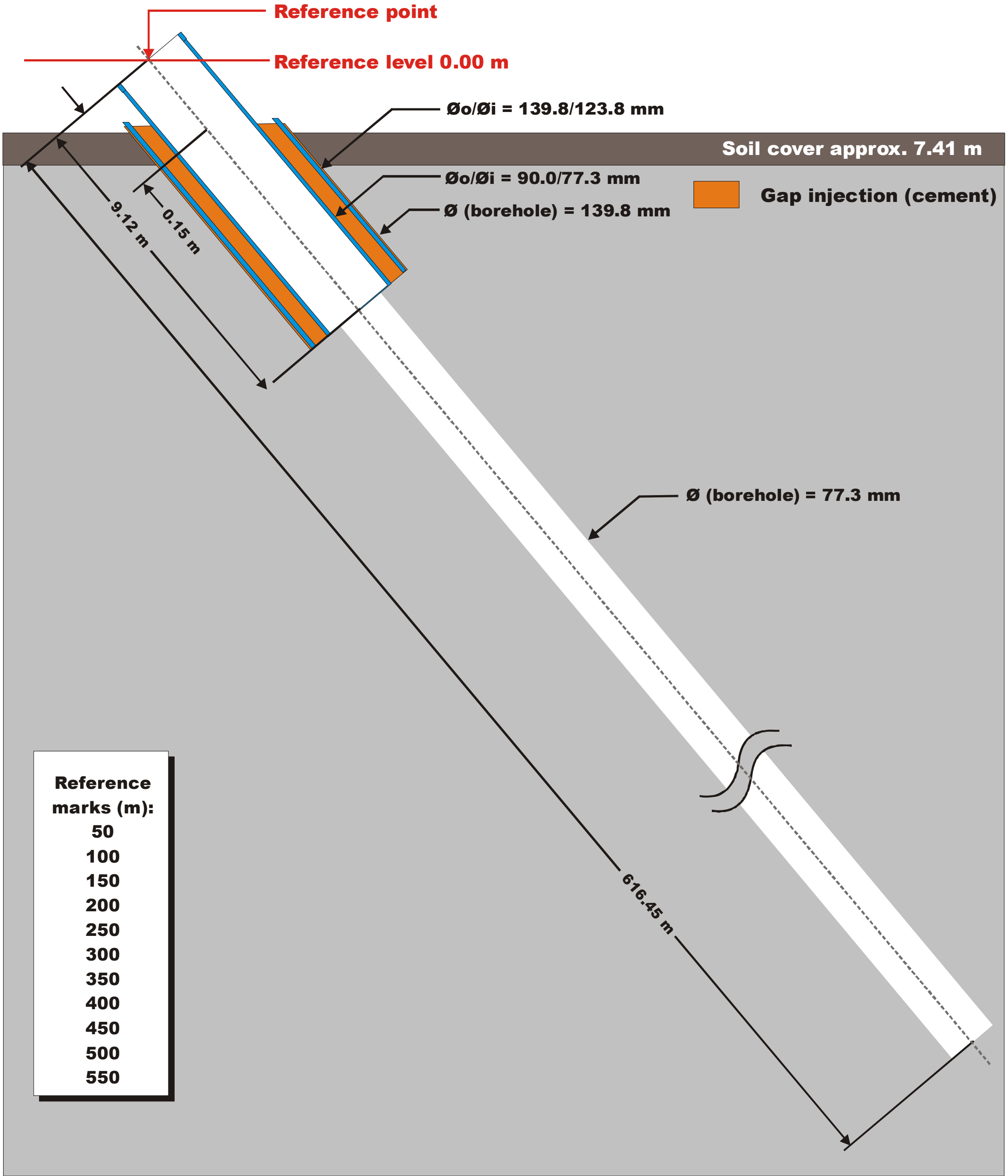


Figure A3-441. *Linear plot of flow rate (Q), pressure (P), pressure above section (Pa) and pressure below section (Pb) versus time from the injection test in section 584.5-589.5 m in borehole KFM09B.*

Appendix 4. Borehole technical data

Technical data
Borehole KFM09B



Drilling reference point

Northing: 6700119.89 (m), RT90 2,5 gon V 0:-15

Easting: 1630638.78 (m), RT90 2,5 gon V 0:-15

Elevation: 4.30 (m), RHB 70

Orientation

Bearing (degrees): 140.83°

Inclination (degrees): -55.08°

Borehole

Length: 616.45 m

Core drilling period

Drilling start date: 2005-11-15

Drilling stop date: 2005-12-21

Rev. 2006-01-20

Appendix 5. Sicada tables

Nomenclature plu_s_hole_test_d

Column	Datatype	Unit	Column Description	Alt. Symbol
site	CHAR		Investigation site name	
activity_type	CHAR		Activity type code	
start_date	DATE		Date (yymmdd hh:mm:ss)	
stop_date	DATE		Date (yymmdd hh:mm:ss)	
project	CHAR		project code	
idcode	CHAR		Object or borehole identification code	
secup	FLOAT	m	Upper section limit (m)	
seclow	FLOAT	m	Lower section limit (m)	
section_no	INTEGER	number	Section number	
test_type	CHAR		Test type code (1-7), see table description	
formation_type	CHAR		1: Rock, 2: Soil (superficial deposits)	
start_flow_period	DATE	yyyymmdd	Date & time of pumping/injection start (YYYY-MM-DD hh:mm:ss)	
stop_flow_period	DATE	yyyymmdd	Date & time of pumping/injection stop (YYYY-MM-DD hh:mm:ss)	
flow_rate_end_qp	FLOAT	m**3/s	Flow rate at the end of the flowing period	
value_type_qp	CHAR		0:true value,-1<lower meas.limit1:>upper meas.limit	
mean_flow_rate_qm	FLOAT	m**3/s	Arithmetic mean flow rate during flow period	
Q_measl__l	FLOAT	m**3/s	Estimated lower measurement limit of flow rate	**Q-measl-L**
Q_measl__u	FLOAT	m**3/s	Estimated upper measurement limit of flow rate	Q-measl-U
tot_volume_vp	FLOAT	m**3	Total volume of pumped or injected water	
dur_flow_phase_tp	FLOAT	s	Duration of the flowing period of the test	
dur_rec_phase_tf	FLOAT	s	Duration of the recovery period of the test	
initial_head_hi	FLOAT	m	Hydraulic head in test section at start of the flow period	
head_at_flow_end_hp	FLOAT	m	Hydraulic head in test section at stop of the flow period.	
final_head_hf	FLOAT	m	Hydraulic head in test section at stop of recovery period.	
initial_press_pi	FLOAT	kPa	Groundwater pressure in test section at start of flow period	
press_at_flow_end_pp	FLOAT	kPa	Groundwater pressure in test section at stop of flow period.	
final_press_pf	FLOAT	kPa	Ground water pressure at the end of the recovery period.	
fluid_temp_tew	FLOAT	oC	Measured section fluid temperature, see table description	
fluid_elcond_ecw	FLOAT	mS/m	Measured section fluid el. conductivity,see table descr.	
fluid_salinity_tdsw	FLOAT	mg/l	Total salinity of section fluid based on EC,see table descr.	
fluid_salinity_tdswm	FLOAT	mg/l	Tot. section fluid salinity based on water sampling,see...	
reference	CHAR		SKB report No for reports describing data and evaluation	
comments	VARCHAR		Short comment to data	
error_flag	CHAR		If error_flag = "*" then an error occured and an error	
In_use	CHAR		If in_use = "*" then the activity has been selected as	
sign	CHAR		Signature for QA data accknowledge (QA - OK)	
Lp	FLOAT	m	Hydraulic point of application	

Nomenclature plu_s_hole_test_ed1

Column	Datatype	Unit	Column Description	Alt. Symbol
site	CHAR		Investigation site name	
activity_type	CHAR		Activity type code	
start_date	DATE		Date (yymmdd hh:mm:ss)	
stop_date	DATE		Date (yymmdd hh:mm:ss)	
project	CHAR		project code	
idcode	CHAR		Object or borehole identification code	

Column	Datatype	Unit	Column Description	Alt. Symbol
secup	FLOAT	m	Upper section limit (m)	
seclow	FLOAT	m	Lower section limit (m)	
section_no	INTEGER	number	Section number	
test_type	CHAR		Test type code (1-7), see table description!	
formation_type	CHAR		Formation type code. 1: Rock, 2: Soil (superficial deposits)	
Lp	FLOAT	m	Hydraulic point of application for test section, see descr.	
seclen_class	FLOAT	m	Planned ordinary test interval during test campaign.	
spec_capacity_q_s	FLOAT	m**2/s	Specific capacity (Q/s) of test section, see table descript.	Q/s
value_type_q_s	CHAR		0:true value,-1:Q/s<lower meas.limit,1:Q/s>upper meas.limit	
transmissivity_tq	FLOAT	m**2/s	Tranmissivity based on Q/s, see table description	
value_type_tq	CHAR		0:true value,-1:TQ<lower meas.limit,1:TQ>upper meas.limit.	
bc_tq	CHAR		Best choice code. 1 means TQ is best choice of T, else 0	
transmissivity_moye	FLOAT	m**2/s	Transmissivity,TM, based on Moye (1967)	T_M
bc_tm	CHAR		Best choice code. 1 means Tmoye is best choice of T, else 0	
value_type_tm	CHAR		0:true value,-1:TM<lower meas.limit,1:TM>upper meas.limit.	
hydr_cond_moye	FLOAT	m/s	K_M: Hydraulic conductivity based on Moye (1967)	K_M
formation_width_b	FLOAT	m	b:Aquifer thickness repr. for T(generally b=Lw) ,see descr.	b
width_of_channel_b	FLOAT	m	B:Inferred width of formation for evaluated TB	
Tb	FLOAT	m**3/s	TB:Flow capacity in 1D formation of T & width B, see descr.	
l_measl_tb	FLOAT	m**3/s	Estimated lower meas. limit for evaluated TB,see description	
U_measl_tb	FLOAT	m**3/s	Estimated upper meas. limit of evaluated TB,see description	
sb	FLOAT	m	SB:S=storativity,B=width of formation,1D model,see descript.	
assumed_sb	FLOAT	m	SB* : Assumed SB,S=storativity,B=width of formation,see...	
leakage_factor_lf	FLOAT	m	Lf:1D model for evaluation of Leakage factor	
transmissivity_tt	FLOAT	m**2/s	TT:Transmissivity of formation, 2D radial flow model,see...	T_T
value_type_tt	CHAR		0:true value,-1:TT<lower meas.limit,1:TT>upper meas.limit,	
bc_tt	CHAR		Best choice code. 1 means TT is best choice of T, else 0	
l_measl_q_s	FLOAT	m**2/s	Estimated lower meas. limit for evaluated TT,see table descr	Q/s-measl-L
U_measl_q_s	FLOAT	m**2/s	Estimated upper meas. limit for evaluated TT,see description	Q/s-measl-U
storativity_s	FLOAT		S:Storativity of formation based on 2D rad flow,see descr.	
assumed_s	FLOAT		Assumed Storativity,2D model evaluation,see table descr.	
bc_s	FLOAT		Best choice of S (Storativity) ,see descr.	
Ri	FLOAT	m	Radius of influence	
Ri_index	CHAR		ri index=index of radius of influence :-1,0 or 1, see descr.	
leakage_coeff	FLOAT	1/s	K'/b':2D rad flow model evaluation of leakage coeff,see desc	
hydr_cond_ksf	FLOAT	m/s	Ksf:3D model evaluation of hydraulic conductivity,see desc.	
value_type_ksf	CHAR		0:true value,-1:Ksf<lower meas.limit,1:Ksf>upper meas.limit,	
l_measl_ksf	FLOAT	m/s	Estimated lower meas.limit for evaluated Ksf,see table desc.	
U_measl_ksf	FLOAT	m/s	Estimated upper meas.limit for evaluated Ksf,see table descr	
spec_storage_ssf	FLOAT	1/m	Ssf:Specific storage,3D model evaluation,see table descr.	
assumed_ssf	FLOAT	1/m	Ssf*:Assumed Spec.storage,3D model evaluation,see table des.	
C	FLOAT	m**3/pa	C: Wellbore storage coefficient; flow or recovery period	C
cd	FLOAT		CD: Dimensionless wellbore storage coefficient	
skin	FLOAT		Skin factor;best estimate of flow/recovery period,see descr.	ξ
dt1	FLOAT	s	Estimated start time of evaluation, see table description	
dt2	FLOAT	s	Estimated stop time of evaluation. see table description	
t1	FLOAT	s	Start time for evaluated parameter from start flow period	t_1
t2	FLOAT	s	Stop time for evaluated parameter from start of flow period	t_2
dte1	FLOAT	s	Start time for evaluated parameter from start of recovery	dte_1
dte2	FLOAT	s	Stop time for evaluated parameter from start of recovery	dte_2
P_horner	FLOAT	kPa	p*:Horner extrapolated pressure, see table description	
transmissivity_t_nlr	FLOAT	m**2/s	T_NLR Transmissivity based on None Linear Regression...	
storativity_s_nlr	FLOAT		S_NLR=storativity based on None Linear Regression,see..	

Column	Datatype	Unit	Column Description	Alt. Symbol
value_type_t_nlr	CHAR		0:true value,-1:T_NLR<lower meas.limit,1:>upper meas.limit	
bc_t_nlr	CHAR		Best choice code. 1 means T_NLR is best choice of T, else 0	
C_nlr	FLOAT	m**3/pa	Wellbore storage coefficient, based on NLR, see descr.	
cd_nlr	FLOAT		Dimensionless wellbore storage constant, see table descrip.	
skin_nlr	FLOAT		Skin factor based on Non Linear Regression,see desc.	
transmissivity_t_grf	FLOAT	m**2/s	T_GRF:Transmissivity based on Genelized Radial Flow,see...	
value_type_t_grf	CHAR		0:true value,-1:T_GRF<lower meas.limit,1:>upper meas.limit	
bc_t_grf	CHAR		Best choice code. 1 means T_GRF is best choice of T, else 0	
storativity_s_grf	FLOAT		S_GRF:Storativity based on Generalized Radial Flow, see des.	
flow_dim_grf	FLOAT		Inferred flow dimesion based on Generalized Rad. Flow model	
comment	VARCHAR	no_unit	Short comment to the evaluated parameters	
error_flag	CHAR		If error_flag = "*" then an error occured and an error	
In_use	CHAR		If in_use = "*" then the activity has been selected as	
sign	CHAR		Signature for QA data accknowledge (QA - OK)	

Nomenclature plu_s_hole_test_obs

Column	Datatype	Unit	Column Description
site	CHAR		Investigation site name
activity_type	CHAR		Activity type code
idcode	CHAR		Object or borehole identification code
start_date	DATE		Date (yymmdd hh:mm:ss)
secup	FLOAT	m	Upper section limit (m)
seclow	FLOAT	m	Lower section limit (m)
obs_secup	FLOAT	m	Upper limit of observation section
obs_seclow	FLOAT	m	Lower limit of observation section
pi_above	FLOAT	kPa	Groundwater pressure above test section,start of flow period
pp_above	FLOAT	kPa	Groundwater pressure above test section,at stop flow period
pf_above	FLOAT	kPa	Groundwater pressure above test section at stop recovery per
pi_below	FLOAT	kPa	Groundwater pressure below test section at start flow period
pp_below	FLOAT	kPa	Groundwater pressure below test section at stop flow period
pf_below	FLOAT	kPa	Groundwater pressure below test section at stop recovery per
comments	VARCHAR		Comment text row (unformatted text)

KFM09B plu_s_hole_test_d. Left (This result table to SICADA includes more columns which are empty, these columns are not presented here.)

idcode	start_date	stop_date	secup	seclow	test_type	Formation_type	start_flow_period	stop_flow_period	flow_rate_end_qp	Value_type_qp	mean_flow_rate_qm
KFM09B	20060209 14:28	20060209 16:28	55.00	155.00	3	1	20060209 15:25:24	20060209 15:55:38	5.46E-05	0	9.28E-05
KFM09B	20060210 07:19	20060210 09:07	155.00	255.00	3	1	20060210 08:05:14	20060210 08:35:28	3.18E-05	0	6.84E-05
KFM09B	20060210 11:13	20060210 13:01	255.00	355.00	3	1	20060210 11:59:00	20060210 12:29:16	6.17E-08	0	1.10E-07
KFM09B	20060210 13:47	20060210 15:35	355.00	455.00	3	1	20060210 14:33:21	20060210 15:03:37	6.12E-07	0	7.69E-07
KFM09B	20060213 09:33	20060213 11:23	455.00	555.00	3	1	20060213 10:20:54	20060213 10:51:13	4.33E-08	0	1.35E-07
KFM09B	20060213 14:06	20060213 15:58	507.00	607.00	3	1	20060213 14:55:42	20060213 15:26:13	3.85E-07	0	2.05E-06
KFM09B	20060215 13:24	20060215 15:07	55.00	75.00	3	1	20060215 14:24:57	20060215 14:45:11	1.46E-04	0	1.78E-04
KFM09B	20060215 15:33	20060215 16:52	75.00	95.00	3	1	20060215 16:09:45	20060215 16:29:57	1.61E-04	0	2.14E-04
KFM09B	20060215 17:22	20060215 18:39	95.00	115.00	3	1	20060215 17:57:23	20060215 18:17:39	2.06E-05	0	3.14E-05
KFM09B	20060216 07:23	20060216 08:41	115.00	135.00	3	1	20060216 07:59:07	20060216 08:19:19	4.04E-05	0	1.02E-04
KFM09B	20060216 09:03	20060216 10:20	135.00	155.00	3	1	20060216 09:38:12	20060216 09:58:26	1.85E-06	0	3.92E-06
KFM09B	20060216 10:38	20060216 11:58	155.00	175.00	3	1	20060216 11:15:45	20060216 11:35:59	2.40E-05	0	3.47E-05
KFM09B	20060216 12:48	20060216 14:07	175.00	195.00	3	1	20060216 13:24:44	20060216 13:44:58	9.18E-08	0	1.85E-07
KFM09B	20060216 14:33	20060216 15:28	195.00	215.00	3	1	20060216 15:09:19	20060216 15:19:15		-1	
KFM09B	20060216 16:02	20060216 17:24	215.00	235.00	3	1	20060216 16:42:22	20060216 17:02:35	1.61E-07	0	5.67E-07
KFM09B	20060217 08:34	20060117 09:54	235.00	255.00	3	1	20060217 09:11:53	20060217 09:32:06	2.75E-05	0	9.29E-05
KFM09B	20060217 10:18	20060217 11:39	255.00	275.00	3	1	20060217 10:56:40	20060217 11:16:54		-1	
KFM09B	20060217 12:39	20060217 13:58	275.00	295.00	3	1	20060217 13:15:29	20060217 13:35:43	5.13E-08	0	7.05E-08
KFM09B	20060217 14:20	20060217 15:37	295.00	315.00	3	1	20060217 14:55:10	20060217 15:15:24	1.39E-08	0	3.51E-08
KFM09B	20060217 16:02	20060217 17:17	315.00	335.00	3	1	20060217 16:34:39	20060217 16:54:45		-1	
KFM09B	20060221 10:56	20060221 12:27	335.00	355.00	3	1	20060221 12:11:27	20060221 12:20:22		-1	
KFM09B	20060221 12:45	20060221 14:02	355.00	375.00	3	1	20060221 13:20:02	20060221 13:40:21	7.50E-09	0	2.84E-08
KFM09B	20060221 14:24	20060221 15:47	375.00	395.00	3	1	20060221 15:05:07	20060221 15:25:21	7.70E-07	0	8.96E-07
KFM09B	20060221 16:09	20060221 17:26	395.00	415.00	3	1	20060221 16:43:53	20060221 17:04:07	2.10E-08	0	6.63E-08
KFM09B	20060222 08:52	20060222 09:35	415.00	435.00	3	1	20060222 09:24:39	20060222 09:27:52		-1	
KFM09B	20060222 10:03	20060222 10:48	435.00	455.00	3	1	20060222 10:38:48	20060222 10:41:04		-1	
KFM09B	20060222 11:06	20060222 13:12	455.00	475.00	3	1	20060222 12:30:21	20060222 12:50:27		-1	

idcode	start_date	stop_date	secup	seclow	test_type	Formation_type	start_flow_period	stop_flow_period	flow_rate_end_qp	Value_type_qp	mean_flow_rate_qm
KFM09B	20060222 13:30	20060222 14:50	475.00	495.00	3	1	20060222 14:07:40	20060222 14:27:55	2.80E-08	0	8.16E-08
KFM09B	20060222 15:14	20060222 15:57	495.00	515.00	3	1	20060222 15:47:39	20060222 15:50:25		-1	
KFM09B	20060222 16:12	20060222 16:59	505.00	525.00	3	1	20060222 16:48:33	20060222 16:52:14		-1	
KFM09B	20060223 08:37	20060223 09:55	515.00	535.00	3	1	20060223 09:12:29	20060223 09:32:43	2.56E-08	0	7.54E-08
KFM09B	20060223 10:10	20060223 11:25	525.50	545.50	3	1	20060223 10:43:12	20060223 11:03:26	2.25E-08	0	7.68E-08
KFM09B	20060223 11:42	20060223 13:03	535.00	555.00	3	1	20060223 12:53:55	20060223 12:55:53		-1	
KFM09B	20060223 13:24	20060223 14:12	545.50	565.50	3	1	20060223 13:57:53	20060223 14:04:45		-1	
KFM09B	20060223 14:29	20060223 15:47	565.50	585.50	3	1	20060223 15:04:42	20060223 15:24:56	5.00E-07	0	2.72E-06
KFM09B	20060223 16:09	20060223 16:50	585.50	605.50	3	1	20060223 16:41:14	20060223 16:42:50		-1	
KFM09B	20051123 13:55	20051123 15:41	10.50	15.50	3	1	20051123 14:58:49	20051123 15:19:08	3.01E-05	0	3.15E-05
KFM09B	20051125 14:49	20051125 16:18	15.50	20.50	3	1	20051125 15:35:32	20051125 15:55:48	3.47E-04	0	3.49E-04
KFM09B	20051125 12:55	20051125 14:22	18.00	23.00	3	1	20051125 13:40:05	20051125 14:00:21	2.79E-04	0	3.03E-04
KFM09B	20051125 10:24	20051125 11:49	21.30	26.30	3	1	20051125 11:06:27	20051125 11:26:47	2.33E-06	0	3.29E-06
KFM09B	20051123 18:10	20051123 19:39	24.00	29.00	3	1	20051123 18:57:09	20051123 19:17:31	3.29E-06	0	4.75E-06
KFM09B	20051123 20:38	20051123 22:16	29.00	34.00	3	1	20051123 21:34:03	20051123 21:54:27	1.13E-06	0	1.43E-06
KFM09B	20051123 22:58	20051124 00:17	34.00	39.00	3	1	20051123 23:35:11	20051123 23:55:34	7.51E-07	0	9.35E-07
KFM09B	20051124 09:12	20051124 10:30	39.00	44.00	3	1	20051124 09:47:46	20051124 10:08:06	7.24E-07	0	9.02E-07
KFM09B	20051124 11:04	20051124 12:53	44.00	49.00	3	1	20051124 12:10:40	20051124 12:31:00	3.23E-05	0	3.36E-05
KFM09B	20051124 13:25	20051124 14:41	49.00	54.00	3	1	20051124 13:58:43	20051124 14:19:00	1.72E-04	0	2.67E-04
KFM09B	20051124 15:53	20051124 17:11	52.75	57.75	3	1	20051124 16:28:38	20051124 16:48:57	1.79E-04	0	2.13E-04
KFM09B	20060313 14:47	20060313 16:02	55.00	60.00	3	1	20060313 15:19:59	20060313 15:40:19	2.95E-08	0	3.82E-08
KFM09B	20060227 10:38	20060227 11:54	60.00	65.00	3	1	20060227 11:11:52	20060227 11:32:06	9.29E-05	0	1.22E-04
KFM09B	20060227 12:31	20060227 13:48	65.00	70.00	3	1	20060227 13:06:26	20060227 13:26:40	1.70E-05	0	1.77E-05
KFM09B	20060227 13:58	20060227 15:14	70.00	75.00	3	1	20060227 14:31:31	20060227 14:51:44	1.60E-06	0	2.20E-06
KFM09B	20060227 15:26	20060227 16:42	75.00	80.00	3	1	20060227 16:00:10	20060227 16:20:24	9.73E-05	0	1.50E-04
KFM09B	20060228 08:10	20060228 09:24	80.00	85.00	3	1	20060228 08:41:38	20060228 09:01:53	7.45E-07	0	2.44E-06
KFM09B	20060228 09:34	20060228 10:50	85.00	90.00	3	1	20060228 10:07:29	20060228 10:27:45	1.26E-07	0	1.92E-07
KFM09B	20060228 11:02	20060228 12:17	90.00	95.00	3	1	20060228 11:34:40	20060228 11:54:53	9.00E-08	0	4.33E-07
KFM09B	20060228 12:55	20060228 14:09	95.00	100.00	3	1	20060228 13:26:44	20060228 13:47:00	1.34E-06	0	3.12E-06
KFM09B	20060228 14:18	20060228 15:32	100.00	105.00	3	1	20060228 14:49:49	20060228 15:10:03	9.83E-06	0	1.10E-05
KFM09B	20060228 15:43	20060228 16:58	105.00	110.00	3	1	20060228 16:15:33	20060228 16:35:47	2.63E-06	0	3.76E-06

idcode	start_date	stop_date	secup	seclow	test_type	Formation_type	start_flow_period	stop_flow_period	flow_rate_end_qp	Value_type_qp	mean_flow_rate_qm
KFM09B	20060301 08:05	20060301 09:22	110.00	115.00	3	1	20060301 08:39:57	20060301 09:00:08	3.37E-06	0	6.00E-06
KFM09B	20060301 09:36	20060301 10:50	115.00	120.00	3	1	20060301 10:08:08	20060301 10:28:21	5.82E-06	0	2.09E-05
KFM09B	20060301 11:02	20060301 11:59	120.00	125.00	3	1	20060301 11:43:56	20060301 11:52:21		-1	
KFM09B	20060301 12:10	20060301 13:24	125.00	130.00	3	1	20060301 12:42:15	20060301 13:02:28	2.30E-05	0	3.27E-05
KFM09B	20060301 13:34	20060301 14:52	130.00	135.00	3	1	20060301 14:09:32	20060301 14:29:46	4.47E-05	0	7.60E-05
KFM09B	20060301 15:05	20060301 16:22	135.00	140.00	3	1	20060301 15:39:25	20060301 15:59:44	2.31E-08	0	9.44E-08
KFM09B	20060302 07:52	20060302 09:06	140.00	145.00	3	1	20060302 08:23:34	20060302 08:43:51	6.21E-09	0	1.14E-08
KFM09B	20060302 09:18	20060302 10:32	145.00	150.00	3	1	20060302 09:50:24	20060302 10:10:39	1.51E-06	0	3.49E-06
KFM09B	20060302 10:59	20060302 11:45	150.00	155.00	3	1	20060302 11:31:46	20060302 11:37:39		-1	
KFM09B	20060302 11:54	20060302 13:08	155.00	160.00	3	1	20060302 12:26:10	20060302 12:46:25	4.70E-06	0	6.17E-06
KFM09B	20060313 12:45	20060313 14:04	160.00	165.00	3	1	20060313 13:21:59	20060313 13:42:17	4.58E-06	0	4.62E-06
KFM09B	20060302 14:08	20060302 15:25	165.00	170.00	3	1	20060302 14:42:44	20060302 15:02:59	1.48E-05	0	2.37E-05
KFM09B	20060303 07:47	20060303 08:31	170.00	175.00	3	1	20060303 08:22:25	20060303 08:23:42		-1	
KFM09B	20060303 08:56	20060303 09:44	175.00	180.00	3	1	20060303 09:33:47	20060303 09:36:40		-1	
KFM09B	20060303 09:57	20060303 11:13	180.00	185.00	3	1	20060303 10:31:10	20060303 10:51:25	6.54E-08	0	1.28E-07
KFM09B	20060303 11:28	20060303 13:26	185.00	190.00	3	1	20060303 12:44:18	20060303 13:04:34	4.36E-08	0	1.17E-07
KFM09B	20060303 13:39	20060303 14:55	190.00	195.00	3	1	20060303 14:12:42	20060303 14:32:59	4.00E-08	0	5.94E-08
KFM09B	20060313 10:12	20060313 11:35	215.00	220.00	3	1	20060313 10:52:54	20060313 11:13:22	3.66E-08	0	2.86E-07
KFM09B	20060306 08:24	20060306 09:42	220.00	225.00	3	1	20060306 09:00:07	20060306 09:20:24	6.05E-08	0	1.00E-07
KFM09B	20060306 09:53	20060306 10:40	225.00	230.00	3	1	20060306 10:25:46	20060306 10:32:42		-1	
KFM09B	20060306 10:49	20060306 12:52	230.00	235.00	3	1	20060306 12:09:12	20060306 12:30:21	4.58E-08	0	9.40E-08
KFM09B	20060306 13:01	20060306 14:21	235.00	240.00	3	1	20060306 13:38:26	20060306 13:58:43	7.31E-08	0	1.65E-07
KFM09B	20060306 14:32	20060306 15:50	240.00	245.00	3	1	20060306 15:08:12	20060306 15:28:28	8.11E-06	0	1.16E-05
KFM09B	20060306 16:06	20060306 17:02	245.00	250.00	3	1	20060306 16:37:31	20060306 16:55:28		-1	
KFM09B	20060307 08:40	20060307 09:59	250.00	255.00	3	1	20060307 09:16:55	20060307 09:37:11	1.52E-05	0	6.05E-05
KFM09B	20060307 10:33	20060307 11:51	275.00	280.00	3	1	20060307 11:09:24	20060307 11:29:42	5.47E-08	0	7.18E-08
KFM09B	20060307 12:50	20060307 14:05	280.00	285.00	3	1	20060307 13:23:18	20060307 13:43:36	8.67E-09	0	1.24E-08
KFM09B	20060307 14:20	20060307 15:20	285.00	290.00	3	1	20060307 14:53:26	20060307 15:12:41		-1	
KFM09B	20060307 15:32	20060307 16:17	290.00	295.00	3	1	20060307 16:07:55	20060307 16:10:20		-1	
KFM09B	20060308 08:14	20060308 08:57	373.00	378.00	3	1	20060308 08:46:53	20060308 08:49:40		-1	
KFM09B	20060308 09:11	20060308 10:28	378.00	383.00	3	1	20060308 09:45:42	20060308 10:05:58	4.47E-07	0	5.05E-07
KFM09B	20060308 10:42	20060308 11:58	383.00	388.00	3	1	20060308 11:16:13	20060308 11:36:30	5.72E-07	0	6.40E-07

idcode	start_date	stop_date	secup	seclow	test_type	Formation_type	start_flow_period	stop_flow_period	flow_rate_end_qp	Value_type_qp	mean_flow_rate_qm
KFM09B	20060308 12:43	20060308 13:24	388.00	393.00	3	1	20060308 13:15:53	20060308 13:17:27		-1	
KFM09B	20060308 13:46	20060308 14:28	393.00	398.00	3	1	20060308 14:18:52	20060308 14:21:13		-1	
KFM09B	20060308 15:17	20060308 16:33	475.00	480.00	3	1	20060308 15:50:36	20060308 16:10:54	2.56E-08	0	7.14E-08
KFM09B	20060309 08:34	20060309 09:25	480.00	485.00	3	1	20060309 09:12:29	20060309 09:14:49		-1	
KFM09B	20060309 09:42	20060309 10:30	485.00	490.00	3	1	20060309 10:17:10	20060309 10:21:33		-1	
KFM09B	20060309 10:43	20060309 11:35	490.00	495.00	3	1	20060309 11:20:49	20060309 11:24:57		-1	
KFM09B	20060309 12:05	20060309 13:34	515.00	520.00	3	1	20060309 13:17:39	20060309 13:22:27		-1	
KFM09B	20060309 13:48	20060309 14:42	520.00	525.00	3	1	20060309 14:24:36	20060309 14:34:30		-1	
KFM09B	20060309 14:56	20060309 16:17	525.00	530.00	3	1	20060309 15:35:08	20060309 15:55:26	1.85E-08	0	6.76E-08
KFM09B	20060309 16:41	20060309 17:59	530.00	535.00	3	1	20060309 17:16:53	20060309 17:37:11	7.51E-09	0	1.94E-08
KFM09B	20060310 14:19	20060310 15:35	564.50	569.50	3	1	20060310 14:52:33	20060310 15:12:51	6.05E-07	0	2.30E-06
KFM09B	20060310 09:45	20060310 11:11	569.50	574.50	3	1	20060310 10:28:34	20060310 10:48:49	7.23E-07	0	2.09E-06
KFM09B	20060310 11:24	20060310 12:07	574.50	579.50	3	1	20060310 11:57:11	20060310 12:00:08		-1	
KFM09B	20060310 12:17	20060310 12:59	579.50	584.50	3	1	20060310 12:50:03	20060310 12:52:09		-1	
KFM09B	20060310 13:17	20060310 14:00	584.50	589.50	3	1	20060310 13:50:46	20060310 13:53:11		-1	
KFM09B	20060227 09:46	20060227 10:28	55.00[1)]	60.00	3	1	20060227 10:25:36	20060227 10:26:19		-1	
KFM09B	20060302 13:18	20060302 13:55	160.00[1)]	165.00	3	1	20060302 13:50:49	20060302 13:52:46	4.30E-07	0	3.65E-06
KFM09B	20060303 15:23	20060303 16:39	215.00[1)]	220.00	3	1	20060303 15:56:28	20060303 16:17:09	4.15E-08	0	3.33E-07
KFM09B	20060210 10:06	20060210 10:57	255.00[1)]	355.00	3	1	20060210 10:53:13	20060210 10:56:33	1.14E-07	0	4.26E-07
KFM09B	20060210 10:59	20060210 11:11	255.00[1)]	355.00	3	1	20060210 11:11:12	20060210 11:11:30		-1	
KFM09B	20060213 12:25	20060213 13:37	507.00[1)]	607.00	3	1	20060213 13:32:53	20060213 13:34:35		-1	
KFM09B	20060310 08:50	20060310 09:33	564.50[1)]	569.50	3	1	20060310 09:26:56	20060310 09:30:05	8.52E-06	0	6.91E-06

[1)] Incomplete test, interrupted and re-performed later.

KFM09B plu_s_hole_test_d. Right (This result table to SICADA includes more columns which are empty, these columns are not presented here.)

idcode	secup	seclow	q_measl__l	q_measl__u	tot_volume_vp	dur_flow_phase_tp	dur_rec_phase_tf	initial_press_pi	press_at_flow_end_pp	final_press_pf	fluid_temp_tew
KFM09B	55.00	155.00	1.7E-08	1.0E-03	1.69E-01	1814	1810	495.85	538.23	509.61	8.84
KFM09B	155.00	255.00	1.7E-08	1.0E-03	1.24E-01	1814	1808	1282.40	1398.00	1334.20	7.36
KFM09B	255.00	355.00	1.7E-08	1.0E-03	2.00E-04	1816	1808	2068.53	2285.94	2138.43	8.30
KFM09B	355.00	455.00	1.7E-08	1.0E-03	1.40E-03	1816	1808	2819.48	3014.22	2843.01	9.13
KFM09B	455.00	555.00	1.7E-08	1.0E-03	2.45E-04	1819	1808	3545.00	3760.37	3681.92	9.95
KFM09B	507.00	607.00	1.7E-08	1.0E-03	3.79E-03	1831	1782	3896.74	4115.10	4084.31	10.33
KFM09B	55.00	75.00	1.7E-08	1.0E-03	2.16E-01	1214	1211	505.70	761.53	610.70	10.45
KFM09B	75.00	95.00	1.7E-08	1.0E-03	2.59E-01	1212	1211	670.70	881.53	745.57	10.13
KFM09B	95.00	115.00	1.7E-08	1.0E-03	3.81E-02	1216	1211	821.53	1060.98	861.71	7.33
KFM09B	115.00	135.00	1.7E-08	1.0E-03	1.25E-01	1212	1211	982.95	1150.02	1086.85	7.68
KFM09B	135.00	155.00	1.7E-08	1.0E-03	4.76E-03	1214	1211	1147.95	1368.41	1255.30	7.28
KFM09B	155.00	175.00	1.7E-08	1.0E-03	4.22E-02	1214	1211	1296.04	1501.90	1317.50	7.25
KFM09B	175.00	195.00	1.7E-08	1.0E-03	2.25E-04	1214	1211	1465.01	1626.86	1541.53	7.56
KFM09B	195.00	215.00	5.0E-09	1.0E-03		596	396	1629.75	1855.85	1835.48	7.71
KFM09B	215.00	235.00	1.7E-08	1.0E-03	6.90E-04	1213	1210	1777.82	2002.27	1935.67	7.91
KFM09B	235.00	255.00	1.7E-08	1.0E-03	1.13E-01	1213	1211	1930.71	2101.35	2050.71	7.68
KFM09B	255.00	275.00	5.0E-09	1.0E-03		1214	1221	2117.59	2330.34	2260.44	8.29
KFM09B	275.00	295.00	1.7E-08	1.0E-03	8.57E-05	1214	1211	2248.33	2486.33	2279.71	8.40
KFM09B	295.00	315.00	6.0E-09	1.0E-03	4.23E-05	1214	1221	2406.31	2640.26	2546.68	8.58
KFM09B	315.00	335.00	5.5E-09	1.0E-03		1206	1221	2565.94	2794.94	2717.88	8.75
KFM09B	335.00	355.00	4.1E-09	1.0E-03		535	321	2733.84	2956.91	2951.27	8.92
KFM09B	355.00	375.00	5.5E-09	1.0E-03	3.42E-05	1219	1221	2877.10	3111.70	3029.44	9.08
KFM09B	375.00	395.00	1.7E-08	1.0E-03	1.09E-03	1214	1211	3015.36	3213.42	3041.00	9.30
KFM09B	395.00	415.00	1.7E-08	1.0E-03	8.07E-05	1214	1210	3171.73	3403.20	3315.13	9.44
KFM09B	415.00	435.00	4.1E-09	1.0E-03		193	321	3337.56	3557.89	3571.65	9.61
KFM09B	435.00	455.00	5.3E-09	1.0E-03		136	321	3514.94	3703.20	3729.62	9.77
KFM09B	455.00	475.00	6.5E-09	1.0E-03		1206	1221	3612.38	3852.93	3779.71	9.93

idcode	secup	seclow	q_measl__l	q_measl__u	tot_volume_vp	dur_flow_phase_tp	dur_rec_phase_tf	initial_press_pi	press_at_flow_end_pp	final_press_pf	fluid_temp_tew
KFM09B	475.00	495.00	1.7E-08	1.0E-03	9.93E-05	1215	1211	3773.11	3993.30	3906.32	10.09
KFM09B	495.00	515.00	4.1E-09	1.0E-03		166	321	3940.46	4139.58	4170.55	10.26
KFM09B	505.00	525.00	4.1E-09	1.0E-03		221	321	4002.10	4215.96	4222.84	10.34
KFM09B	515.00	535.00	1.7E-08	1.0E-03	9.15E-05	1214	1213	4042.15	4279.81	4212.93	10.35
KFM09B	525.50	545.50	1.7E-08	1.0E-03	9.34E-05	1214	1213	4121.83	4351.10	4288.34	10.44
KFM09B	535.00	555.00	6.5E-09	1.0E-03		118	321	4202.48	4417.43	4439.18	10.52
KFM09B	545.50	565.50	6.5E-09	1.0E-03		412	321	4266.05	4492.02	4483.21	10.60
KFM09B	565.50	585.50	1.7E-08	1.0E-03	3.39E-03	1214	1182	4389.07	4607.60	4576.79	10.80
KFM09B	585.50	605.50	5.3E-09	1.0E-03		96	321	4589.58	4766.97	4822.84	10.91
KFM09B	10.50	15.50	1.7E-08	1.0E-03	3.85E-02	1219	1202	190.95	387.46	195.91	11.90
KFM09B	15.50	20.50	1.7E-08	1.0E-03	4.24E-01	1216	1208	214.46	384.12	219.29	13.94
KFM09B	18.00	23.00	1.7E-08	1.0E-03	3.68E-01	1216	1208	232.53	433.25	236.95	12.91
KFM09B	21.30	26.30	1.7E-08	1.0E-03	4.02E-03	1220	1203	257.37	528.53	288.83	7.72
KFM09B	24.00	29.00	1.7E-08	1.0E-03	5.83E-03	1222	1197	283.59	491.43	327.48	7.78
KFM09B	29.00	34.00	1.7E-08	1.0E-03	1.75E-03	1224	1199	322.79	703.95	342.94	7.59
KFM09B	34.00	39.00	1.7E-08	1.0E-03	1.15E-03	1223	1197	363.35	575.86	365.56	7.51
KFM09B	39.00	44.00	1.7E-08	1.0E-03	1.10E-03	1220	1203	399.24	599.60	400.88	7.43
KFM09B	44.00	49.00	1.7E-08	1.0E-03	4.11E-02	1220	1203	437.17	637.68	440.08	8.44
KFM09B	49.00	54.00	1.7E-08	1.0E-03	3.25E-01	1217	1200	477.61	507.90	484.78	12.28
KFM09B	52.75	57.75	1.7E-08	1.0E-03	2.59E-01	1219	1202	512.52	594.62	518.45	12.02
KFM09B	55.00	60.00	3.7E-09	1.0E-03	4.67E-05	1220	1203	507.86	721.85	539.91	7.06
KFM09B	60.00	65.00	1.7E-08	1.0E-03	1.48E-01	1214	1211	541.19	743.76	644.68	9.54
KFM09B	65.00	70.00	1.7E-08	1.0E-03	2.16E-02	1214	1207	583.03	730.39	587.43	7.31
KFM09B	70.00	75.00	1.7E-08	1.0E-03	2.67E-03	1213	1210	622.12	812.01	644.68	7.15
KFM09B	75.00	80.00	1.7E-08	1.0E-03	1.83E-01	1214	1211	661.19	805.97	715.69	9.39
KFM09B	80.00	85.00	1.7E-08	1.0E-03	3.00E-03	1215	1194	706.44	871.95	818.45	7.13
KFM09B	85.00	90.00	1.7E-08	1.0E-03	2.34E-04	1216	1209	749.64	944.58	802.49	7.07
KFM09B	90.00	95.00	1.7E-08	1.0E-03	5.29E-04	1213	1206	787.62	991.80	948.92	7.05
KFM09B	95.00	100.00	1.7E-08	1.0E-03	3.80E-03	1216	1210	826.29	1033.69	948.92	7.10
KFM09B	100.00	105.00	1.7E-08	1.0E-03	1.33E-02	1214	1211	858.92	1067.51	861.95	7.06
KFM09B	105.00	110.00	1.7E-08	1.0E-03	4.57E-03	1214	1210	903.36	1103.18	969.28	7.11

idcode	secup	seclow	q_measl__l	q_measl__u	tot_volume_vp	dur_flow_phase_tp	dur_rec_phase_tf	initial_press_pi	press_at_flow_end_pp	final_press_pf	fluid_temp_tew
KFM09B	110.00	115.00	1.7E-08	1.0E-03	7.31E-03	1211	1209	940.25	1066.11	974.24	7.10
KFM09B	115.00	120.00	1.7E-08	1.0E-03	2.55E-02	1213	1209	981.94	1161.39	1112.40	7.09
KFM09B	120.00	125.00	4.1E-09	1.0E-03		505	322	1034.23	1285.24	1246.71	7.16
KFM09B	125.00	130.00	1.7E-08	1.0E-03	3.98E-02	1213	1211	1062.31	1242.06	1111.85	7.09
KFM09B	130.00	135.00	1.7E-08	1.0E-03	9.24E-02	1214	1210	1105.52	1290.20	1172.95	7.22
KFM09B	135.00	140.00	1.7E-08	1.0E-03	1.15E-04	1219	1209	1156.99	1390.99	1340.29	7.25
KFM09B	140.00	145.00	2.8E-09	1.0E-03	1.38E-05	1217	1221	1204.33	1420.25	1275.34	7.28
KFM09B	145.00	150.00	1.7E-08	1.0E-03	4.24E-03	1215	1208	1224.69	1429.50	1324.88	7.35
KFM09B	150.00	155.00	5.3E-09	1.0E-03		353	321	1271.35	1505.43	1456.99	7.34
KFM09B	155.00	160.00	1.7E-08	1.0E-03	7.51E-03	1215	1209	1297.36	1505.43	1305.06	7.35
KFM09B	160.00	165.00	1.7E-08	1.0E-03	5.63E-03	1218	1205	1347.04	1508.05	1346.90	7.37
KFM09B	165.00	170.00	1.7E-08	1.0E-03	2.88E-02	1215	1210	1376.35	1565.98	1415.72	7.32
KFM09B	170.00	175.00	5.3E-09	1.0E-03		77	320	1450.38	1655.84	1663.96	7.49
KFM09B	175.00	180.00	4.1E-09	1.0E-03		173	321	1471.72	1695.34	1658.46	7.52
KFM09B	180.00	185.00	1.7E-08	1.0E-03	1.56E-04	1215	1209	1504.47	1740.15	1622.68	7.57
KFM09B	185.00	190.00	1.7E-08	1.0E-03	1.43E-04	1216	1208	1543.82	1780.80	1703.60	7.61
KFM09B	190.00	195.00	1.7E-08	1.0E-03	7.24E-05	1217	1208	1588.56	1803.79	1619.93	7.65
KFM09B	215.00	220.00	1.7E-08	1.0E-03	3.49E-04	1228	1202	1771.31	1968.40	1944.15	7.85
KFM09B	220.00	225.00	1.7E-08	1.0E-03	1.22E-04	1217	1208	1823.06	2031.82	1884.70	7.92
KFM09B	225.00	230.00	5.3E-09	1.0E-03		416	321	1877.41	2073.51	2021.22	7.96
KFM09B	230.00	235.00	1.7E-08	1.0E-03	1.20E-04	1269	1207	1900.66	2116.17	2009.66	8.00
KFM09B	235.00	240.00	1.7E-08	1.0E-03	2.02E-04	1217	1203	1939.20	2147.79	2045.44	8.05
KFM09B	240.00	245.00	1.7E-08	1.0E-03	1.41E-02	1216	1209	1977.18	2148.37	2035.53	8.03
KFM09B	245.00	250.00	5.3E-09	1.0E-03		1077	322	2039.11	2225.29	2210.57	8.18
KFM09B	250.00	255.00	1.7E-08	1.0E-03	7.38E-02	1216	1202	2052.05	2181.35	2149.47	7.90
KFM09B	275.00	280.00	1.7E-08	1.0E-03	8.76E-05	1218	1206	2254.88	2465.99	2281.04	8.39
KFM09B	280.00	285.00	5.3E-09	1.0E-03	1.50E-05	1218	1221	2291.49	2508.93	2366.35	8.43
KFM09B	285.00	290.00	5.3E-09	1.0E-03		1155	321	2341.04	2546.37	2460.49	8.48
KFM09B	290.00	295.00	4.1E-09	1.0E-03		145	322	2383.56	2580.90	2583.24	8.52
KFM09B	373.00	378.00	5.3E-09	1.0E-03		167	321	3029.66	3222.88	3221.78	9.25
KFM09B	378.00	383.00	1.7E-08	1.0E-03	6.15E-04	1216	1208	3042.33	3258.66	3054.99	9.26
KFM09B	383.00	388.00	1.7E-08	1.0E-03	7.79E-04	1217	1208	3082.64	3309.85	3093.52	9.33

idcode	secup	seclow	q_measl__l	q_measl__u	tot_volume_vp	dur_flow_phase_tp	dur_rec_phase_tf	initial_press_pi	press_at_flow_end_pp	final_press_pf	fluid_temp_tew
KFM09B	388.00	393.00	5.3E-09	1.0E-03		94	322	3189.30	3337.93	3374.25	9.38
KFM09B	393.00	398.00	4.1E-09	1.0E-03		141	321	3214.48	3373.56	3400.13	9.41
KFM09B	475.00	480.00	1.7E-08	1.0E-03	8.71E-05	1218	1207	3777.74	3987.88	3901.59	10.06
KFM09B	480.00	485.00	5.3E-09	1.0E-03		140	494	3905.86	4034.81	4103.61	10.10
KFM09B	485.00	490.00	5.3E-09	1.0E-03		263	429	3981.14	4071.41	4191.68	10.16
KFM09B	490.00	495.00	5.3E-09	1.0E-03		248	492	4052.29	4107.47	4303.99	10.21
KFM09B	515.00	520.00	5.3E-09	1.0E-03		288	432	4169.67	4282.52	4351.33	10.41
KFM09B	520.00	525.00	5.3E-09	1.0E-03		594	363	4213.84	4317.20	4371.69	10.45
KFM09B	525.00	530.00	1.7E-08	1.0E-03	8.15E-05	1218	1220	4127.84	4375.10	4300.13	10.51
KFM09B	530.00	535.00	6.5E-09	1.0E-03	2.34E-05	1218	1221	4191.28	4408.57	4296.28	10.54
KFM09B	564.50	569.50	1.7E-08	1.0E-03	2.81E-03	1218	1206	4397.70	4597.93	4558.86	10.86
KFM09B	569.50	574.50	1.7E-08	1.0E-03	2.58E-03	1215	1193	4435.55	4570.90	4519.77	10.92
KFM09B	574.50	579.50	4.1E-09	1.0E-03		177	322	4532.98	4672.24	4677.20	10.90
KFM09B	579.50	584.50	4.1E-09	1.0E-03		126	321	4561.60	4707.48	4731.14	10.92
KFM09B	584.50	589.50	5.3E-09	1.0E-03		145	321	4634.68	4743.11	4765.27	10.96
KFM09B	55.00[1)]	60.00	1.7E-08	1.0E-03		43	23	500.60	810.91	790.55	7.10
KFM09B	160.00[1)]	165.00	1.7E-08	1.0E-03	4.28E-04	117	61	1336.58	1405.38	1336.99	7.42
KFM09B	215.00[1)]	220.00	1.7E-08	1.0E-03	4.13E-04	1241	1185	1782.86	1995.90	1968.92	7.87
KFM09B	255.00[1)]	355.00	1.7E-08	1.0E-03	8.53E-05	200	20	2071.82	2284.99	2279.34	8.30
KFM09B	255.00[1)]	355.00	1.7E-08	1.0E-03		18	12	2096.59	2117.65	2117.51	8.31
KFM09B	507.00[1)]	607.00	1.7E-08	1.0E-03		102	15	3945.46	4010.00	4008.35	10.39
KFM09B	564.50[1)]	569.50	1.7E-08	1.0E-03	1.31E-03	189	50	4402.10	4717.10	4519.23	10.92

[1)] Incomplete test, interrupted and re-performed later.

KFM09B plu_s_hole_test_ed1. Left (This result table to SICADA includes more columns which are empty, these columns are not presented here.)

idcode	start_date	stop_date	secup	seclow	test_type	formation_type	spec_capacity_q_s	value_type_q_s	transmissivity_moye	bc_tm	value_type_tm	hydr_cond_moye	formation_width_b
KFM09B	20060209 14:28	20060209 16:28	55.00	155.00	3	1	1.26E-05	0	1.64E-05	0	0	1.64E-07	100.00
KFM09B	20060210 07:19	20060210 09:07	155.00	255.00	3	1	2.70E-06	0	3.51E-06	0	0	3.51E-08	100.00
KFM09B	20060210 11:13	20060210 13:01	255.00	355.00	3	1	2.79E-09	0	3.62E-09	0	0	3.62E-11	100.00
KFM09B	20060210 13:47	20060210 15:35	355.00	455.00	3	1	3.08E-08	0	4.01E-08	0	0	4.01E-10	100.00
KFM09B	20060213 09:33	20060213 11:23	455.00	555.00	3	1	1.97E-09	0	2.57E-09	0	0	2.57E-11	100.00
KFM09B	20060213 14:06	20060213 15:58	507.00	607.00	3	1	1.73E-08	0	2.25E-08	0	0	2.25E-10	100.00
KFM09B	20060215 13:24	20060215 15:07	55.00	75.00	3	1	5.61E-06	0	5.86E-06	0	0	2.93E-07	20.00
KFM09B	20060215 15:33	20060215 16:52	75.00	95.00	3	1	7.48E-06	0	7.80E-06	0	0	3.90E-07	20.00
KFM09B	20060215 17:22	20060215 18:39	95.00	115.00	3	1	8.43E-07	0	8.80E-07	0	0	4.40E-08	20.00
KFM09B	20060216 07:23	20060216 08:41	115.00	135.00	3	1	2.37E-06	0	2.47E-06	1	0	1.24E-07	20.00
KFM09B	20060216 09:03	20060216 10:20	135.00	155.00	3	1	8.24E-08	0	8.60E-08	0	0	4.30E-09	20.00
KFM09B	20060216 10:38	20060216 11:58	155.00	175.00	3	1	1.14E-06	0	1.19E-06	0	0	5.97E-08	20.00
KFM09B	20060216 12:48	20060216 14:07	175.00	195.00	3	1	5.57E-09	0	5.81E-09	0	0	2.90E-10	20.00
KFM09B	20060216 14:33	20060216 15:28	195.00	215.00	3	1	2.50E-10	-1	2.61E-10	0	-1	1.30E-11	20.00
KFM09B	20060216 16:02	20060216 17:24	215.00	235.00	3	1	7.04E-09	0	7.34E-09	0	0	3.67E-10	20.00
KFM09B	20060217 08:34	20060117 09:54	235.00	255.00	3	1	1.58E-06	0	1.65E-06	0	0	8.24E-08	20.00
KFM09B	20060217 10:18	20060217 11:39	255.00	275.00	3	1	2.50E-10	-1	2.61E-10	0	-1	1.30E-11	20.00
KFM09B	20060217 12:39	20060217 13:58	275.00	295.00	3	1	2.12E-09	0	2.21E-09	0	0	1.10E-10	20.00
KFM09B	20060217 14:20	20060217 15:37	295.00	315.00	3	1	5.82E-10	0	6.07E-10	0	0	3.04E-11	20.00
KFM09B	20060217 16:02	20060217 17:17	315.00	335.00	3	1	2.75E-10	-1	2.87E-10	0	-1	1.43E-11	20.00
KFM09B	20060221 10:56	20060221 12:27	335.00	355.00	3	1	2.05E-10	-1	2.14E-10	0	-1	1.07E-11	20.00
KFM09B	20060221 12:45	20060221 14:02	355.00	375.00	3	1	3.14E-10	0	3.27E-10	1	0	1.64E-11	20.00
KFM09B	20060221 14:24	20060221 15:47	375.00	395.00	3	1	3.81E-08	0	3.98E-08	0	0	1.99E-09	20.00
KFM09B	20060221 16:09	20060221 17:26	395.00	415.00	3	1	8.88E-10	0	9.27E-10	0	0	4.63E-11	20.00
KFM09B	20060222 08:52	20060222 09:35	415.00	435.00	3	1	2.04E-10	-1	2.13E-10	0	-1	1.06E-11	20.00
KFM09B	20060222 10:03	20060222 10:48	435.00	455.00	3	1	2.64E-10	-1	2.76E-10	0	-1	1.38E-11	20.00
KFM09B	20060222 11:06	20060222 13:12	455.00	475.00	3	1	3.27E-10	-1	3.41E-10	0	-1	1.70E-11	20.00
KFM09B	20060222 13:30	20060222 14:50	475.00	495.00	3	1	1.25E-09	0	1.30E-09	0	0	6.51E-11	20.00
KFM09B	20060222 15:14	20060222 15:57	495.00	515.00	3	1	2.04E-10	-1	2.13E-10	0	-1	1.06E-11	20.00

idcode	start_date	stop_date	secup	seclow	test_type	formation_type	spec_capacity_q_s	value_type_q_s	transmissivity_moye	bc_tm	value_type_tm	hydr_cond_moye	formation_width_b
KFM09B	20060222 16:12	20060222 16:59	505.00	525.00	3	1	2.04E-10	-1	2.13E-10	0	-1	1.06E-11	20.00
KFM09B	20060223 08:37	20060223 09:55	515.00	535.00	3	1	1.06E-09	0	1.10E-09	0	0	5.50E-11	20.00
KFM09B	20060223 10:10	20060223 11:25	525.50	545.50	3	1	9.62E-10	0	1.00E-09	0	0	5.02E-11	20.00
KFM09B	20060223 11:42	20060223 13:03	535.00	555.00	3	1	3.27E-10	-1	3.41E-10	0	-1	1.70E-11	20.00
KFM09B	20060223 13:24	20060223 14:12	545.50	565.50	3	1	3.27E-10	-1	3.41E-10	0	-1	1.70E-11	20.00
KFM09B	20060223 14:29	20060223 15:47	565.50	585.50	3	1	2.25E-08	0	2.34E-08	0	0	1.17E-09	20.00
KFM09B	20060223 16:09	20060223 16:50	585.50	605.50	3	1	2.64E-10	-1	2.76E-10	0	-1	1.38E-11	20.00
KFM09B	20051123 13:55	20051123 15:41	10.50	15.50	3	1	1.50E-06	0	1.24E-06	0	0	2.47E-07	5.00
KFM09B	20051125 14:49	20051125 16:18	15.50	20.50	3	1	2.01E-05	0	1.65E-05	0	0	3.30E-06	5.00
KFM09B	20051125 12:55	20051125 14:22	18.00	23.00	3	1	1.36E-05	0	1.12E-05	0	0	2.24E-06	5.00
KFM09B	20051125 10:24	20051125 11:49	21.30	26.30	3	1	8.44E-08	0	6.94E-08	0	0	1.39E-08	5.00
KFM09B	20051123 18:10	20051123 19:39	24.00	29.00	3	1	1.55E-07	0	1.28E-07	0	0	2.56E-08	5.00
KFM09B	20051123 20:38	20051123 22:16	29.00	34.00	3	1	2.90E-08	0	2.38E-08	0	0	4.77E-09	5.00
KFM09B	20051123 22:58	20051124 00:17	34.00	39.00	3	1	3.47E-08	0	2.85E-08	0	0	5.70E-09	5.00
KFM09B	20051124 09:12	20051124 10:30	39.00	44.00	3	1	3.54E-08	0	2.92E-08	0	0	5.83E-09	5.00
KFM09B	20051124 11:04	20051124 12:53	44.00	49.00	3	1	1.58E-06	0	1.30E-06	0	0	2.60E-07	5.00
KFM09B	20051124 13:25	20051124 14:41	49.00	54.00	3	1	5.56E-05	0	4.57E-05	0	0	9.14E-06	5.00
KFM09B	20051124 15:53	20051124 17:11	52.75	57.75	3	1	2.14E-05	0	1.76E-05	0	0	3.52E-06	5.00
KFM09B	20060313 14:47	20060313 16:02	55.00	60.00	3	1	1.35E-09	0	1.11E-09	0	0	2.22E-10	5.00
KFM09B	20060227 10:38	20060227 11:54	60.00	65.00	3	1	4.50E-06	0	3.70E-06	0	0	7.40E-07	5.00
KFM09B	20060227 12:31	20060227 13:48	65.00	70.00	3	1	1.13E-06	0	9.30E-07	0	0	1.86E-07	5.00
KFM09B	20060227 13:58	20060227 15:14	70.00	75.00	3	1	8.28E-08	0	6.82E-08	0	0	1.36E-08	5.00
KFM09B	20060227 15:26	20060227 16:42	75.00	80.00	3	1	6.59E-06	0	5.43E-06	0	0	1.09E-06	5.00
KFM09B	20060228 08:10	20060228 09:24	80.00	85.00	3	1	4.42E-08	0	3.64E-08	0	0	7.27E-09	5.00
KFM09B	20060228 09:34	20060228 10:50	85.00	90.00	3	1	6.35E-09	0	5.22E-09	0	0	1.04E-09	5.00
KFM09B	20060228 11:02	20060228 12:17	90.00	95.00	3	1	4.33E-09	0	3.56E-09	0	0	7.12E-10	5.00
KFM09B	20060228 12:55	20060228 14:09	95.00	100.00	3	1	6.33E-08	0	5.20E-08	0	0	1.04E-08	5.00
KFM09B	20060228 14:18	20060228 15:32	100.00	105.00	3	1	4.62E-07	0	3.80E-07	0	0	7.61E-08	5.00
KFM09B	20060228 15:43	20060228 16:58	105.00	110.00	3	1	1.29E-07	0	1.06E-07	0	0	2.13E-08	5.00
KFM09B	20060301 08:05	20060301 09:22	110.00	115.00	3	1	2.63E-07	0	2.16E-07	0	0	4.32E-08	5.00
KFM09B	20060301 09:36	20060301 10:50	115.00	120.00	3	1	3.18E-07	0	2.62E-07	0	0	5.24E-08	5.00
KFM09B	20060301 11:02	20060301 11:59	120.00	125.00	3	1	2.04E-10	-1	1.68E-10	0	-1	3.36E-11	5.00
KFM09B	20060301 12:10	20060301 13:24	125.00	130.00	3	1	1.25E-06	0	1.03E-06	0	0	2.06E-07	5.00

idcode	start_date	stop_date	secup	seclow	test_type	formation_type	spec_capacity_q_s	value_type_q_s	transmissivity_moye	bc_tm	value_type_tm	hydr_cond_moye	formation_width_b
KFM09B	20060301 13:34	20060301 14:52	130.00	135.00	3	1	2.37E-06	0	1.95E-06	0	0	3.91E-07	5.00
KFM09B	20060301 15:05	20060301 16:22	135.00	140.00	3	1	9.68E-10	0	7.97E-10	0	0	1.59E-10	5.00
KFM09B	20060302 07:52	20060302 09:06	140.00	145.00	3	1	2.82E-10	0	2.32E-10	0	0	4.65E-11	5.00
KFM09B	20060302 09:18	20060302 10:32	145.00	150.00	3	1	7.25E-08	0	5.96E-08	0	0	1.19E-08	5.00
KFM09B	20060302 10:59	20060302 11:45	150.00	155.00	3	1	2.64E-10	-1	2.17E-10	0	-1	4.35E-11	5.00
KFM09B	20060302 11:54	20060302 13:08	155.00	160.00	3	1	2.22E-07	0	1.83E-07	0	0	3.65E-08	5.00
KFM09B	20060313 12:45	20060313 14:04	160.00	165.00	3	1	2.79E-07	0	2.30E-07	1	0	4.60E-08	5.00
KFM09B	20060302 14:08	20060302 15:25	165.00	170.00	3	1	7.63E-07	0	6.28E-07	1	0	1.26E-07	5.00
KFM09B	20060303 07:47	20060303 08:31	170.00	175.00	3	1	2.64E-10	-1	2.17E-10	0	-1	4.35E-11	5.00
KFM09B	20060303 08:56	20060303 09:44	175.00	180.00	3	1	2.04E-10	-1	1.68E-10	0	-1	3.36E-11	5.00
KFM09B	20060303 09:57	20060303 11:13	180.00	185.00	3	1	2.72E-09	0	2.24E-09	0	0	4.48E-10	5.00
KFM09B	20060303 11:28	20060303 13:26	185.00	190.00	3	1	1.81E-09	0	1.49E-09	0	0	2.97E-10	5.00
KFM09B	20060303 13:39	20060303 14:55	190.00	195.00	3	1	1.82E-09	0	1.50E-09	0	0	3.00E-10	5.00
KFM09B	20060313 10:12	20060313 11:35	215.00	220.00	3	1	1.82E-09	0	1.50E-09	1	0	3.00E-10	5.00
KFM09B	20060306 08:24	20060306 09:42	220.00	225.00	3	1	2.84E-09	0	2.34E-09	0	0	4.68E-10	5.00
KFM09B	20060306 09:53	20060306 10:40	225.00	230.00	3	1	2.64E-10	-1	2.17E-10	0	-1	4.35E-11	5.00
KFM09B	20060306 10:49	20060306 12:52	230.00	235.00	3	1	2.09E-09	0	1.72E-09	0	0	3.43E-10	5.00
KFM09B	20060306 13:01	20060306 14:21	235.00	240.00	3	1	3.44E-09	0	2.83E-09	0	0	5.66E-10	5.00
KFM09B	20060306 14:32	20060306 15:50	240.00	245.00	3	1	4.65E-07	0	3.82E-07	0	0	7.65E-08	5.00
KFM09B	20060306 16:06	20060306 17:02	245.00	250.00	3	1	2.64E-10	-1	2.17E-10	0	-1	4.35E-11	5.00
KFM09B	20060307 08:40	20060307 09:59	250.00	255.00	3	1	1.16E-06	0	9.51E-07	0	0	1.90E-07	5.00
KFM09B	20060307 10:33	20060307 11:51	275.00	280.00	3	1	2.54E-09	0	2.09E-09	0	0	4.18E-10	5.00
KFM09B	20060307 12:50	20060307 14:05	280.00	285.00	3	1	3.91E-10	0	3.22E-10	0	0	6.44E-11	5.00
KFM09B	20060307 14:20	20060307 15:20	285.00	290.00	3	1	2.64E-10	-1	2.17E-10	0	-1	4.35E-11	5.00
KFM09B	20060307 15:32	20060307 16:17	290.00	295.00	3	1	2.04E-10	-1	1.68E-10	0	-1	3.36E-11	5.00
KFM09B	20060308 08:14	20060308 08:57	373.00	378.00	3	1	2.64E-10	-1	2.17E-10	0	-1	4.35E-11	5.00
KFM09B	20060308 09:11	20060308 10:28	378.00	383.00	3	1	2.03E-08	0	1.67E-08	0	0	3.34E-09	5.00
KFM09B	20060308 10:42	20060308 11:58	383.00	388.00	3	1	2.47E-08	0	2.03E-08	0	0	4.07E-09	5.00
KFM09B	20060308 12:43	20060308 13:24	388.00	393.00	3	1	2.64E-10	-1	2.17E-10	0	-1	4.35E-11	5.00
KFM09B	20060308 13:46	20060308 14:28	393.00	398.00	3	1	2.04E-10	-1	1.68E-10	0	-1	3.36E-11	5.00
KFM09B	20060308 15:17	20060308 16:33	475.00	480.00	3	1	1.19E-09	0	9.82E-10	0	0	1.96E-10	5.00
KFM09B	20060309 08:34	20060309 09:25	480.00	485.00	3	1	2.64E-10	-1	2.17E-10	0	-1	4.35E-11	5.00
KFM09B	20060309 09:42	20060309 10:30	485.00	490.00	3	1	2.64E-10	-1	2.17E-10	0	-1	4.35E-11	5.00
KFM09B	20060309 10:43	20060309 11:35	490.00	495.00	3	1	2.64E-10	-1	2.17E-10	0	-1	4.35E-11	5.00

idcode	start_date	stop_date	secup	seclow	test_type	formation_type	spec_capacity_q_s	value_type_q_s	transmissivity_moye	bc_tm	value_type_tm	hydr_cond_moye	formation_width_b
KFM09B	20060309 12:05	20060309 13:34	515.00	520.00	3	1	2.64E-10	-1	2.17E-10	0	-1	4.35E-11	5.00
KFM09B	20060309 13:48	20060309 14:42	520.00	525.00	3	1	2.64E-10	-1	2.17E-10	0	-1	4.35E-11	5.00
KFM09B	20060309 14:56	20060309 16:17	525.00	530.00	3	1	7.34E-10	0	6.04E-10	0	0	1.21E-10	5.00
KFM09B	20060309 16:41	20060309 17:59	530.00	535.00	3	1	3.39E-10	0	2.79E-10	0	0	5.58E-11	5.00
KFM09B	20060310 14:19	20060310 15:35	564.50	569.50	3	1	2.97E-08	0	2.44E-08	1	0	4.88E-09	5.00
KFM09B	20060310 09:45	20060310 11:11	569.50	574.50	3	1	5.24E-08	0	4.31E-08	0	0	8.63E-09	5.00
KFM09B	20060310 11:24	20060310 12:07	574.50	579.50	3	1	2.04E-10	-1	1.68E-10	0	-1	3.36E-11	5.00
KFM09B	20060310 12:17	20060310 12:59	579.50	584.50	3	1	2.04E-10	-1	1.68E-10	0	-1	3.36E-11	5.00
KFM09B	20060310 13:17	20060310 14:00	584.50	589.50	3	1	2.64E-10	-1	2.17E-10	0	-1	4.35E-11	5.00
KFM09B	20060227 09:46	20060227 10:28	55.00[1)]	60.00	3	1	8.33E-10	-1	6.86E-10	0	-1	1.37E-10	5.00
KFM09B	20060302 13:18	20060302 13:55	160.00[1)]	165.00	3	1	6.13E-08	0	5.05E-08	0	0	1.01E-08	5.00
KFM09B	20060303 15:23	20060303 16:39	215.00[1)]	220.00	3	1	1.91E-09	0	1.57E-09	0	0	3.15E-10	5.00
KFM09B	20060210 10:06	20060210 10:57	255.00[1)]	355.00	3	1	5.26E-09	0	6.83E-09	0	0	6.83E-11	100.00
KFM09B	20060210 10:59	20060210 11:11	255.00[1)]	355.00	3	1	8.33E-10	-1	1.08E-09	0	-1	1.08E-11	100.00
KFM09B	20060213 12:25	20060213 13:37	507.00[1)]	607.00	3	1	8.33E-10	-1	1.08E-09	0	-1	1.08E-11	100.00
KFM09B	20060310 08:50	20060310 09:33	564.50[1)]	569.50	3	1	2.65E-07	0	2.18E-07	0	0	4.37E-08	5.00

[1)] Incomplete test, interrupted and re-performed later.

KFM09B plu_s_hole_test_ed1. Right (This result table to SICADA includes more columns which are empty, these columns are not presented here.)

idcode	secup	seclow	transmissivity_tt	value_type_tt	bc_tt	l_measl_q_s	u_measl_q_s	assumed_s	bc_s	ri	ri_index	c	skin	t1	t2	dte1	dte2
KFM09B	55.00	155.00	1.62E-06	0	1	3.9E-09	5.0E-04	8.91E-07	8.91E-07	86.15	1						
KFM09B	155.00	255.00	6.30E-07	0	1	1.4E-09	5.0E-04	5.55E-07	5.55E-07	68.02	1						
KFM09B	255.00	355.00	7.32E-10	0	1	7.5E-10	5.0E-04	1.89E-08	1.89E-08	15.32	0	3.46E-10	-4.77			2000	2700
KFM09B	355.00	455.00	1.98E-08	0	1	8.4E-10	5.0E-04	9.84E-08	9.84E-08	21.25	1	4.45E-10	-2.83	20	1000		
KFM09B	455.00	555.00	6.74E-10	0	1	7.6E-10	5.0E-04	1.82E-08	1.82E-08	12.28	1						
KFM09B	507.00	607.00	2.74E-08	0	1	7.5E-10	5.0E-04	1.16E-07	1.16E-07	30.78	1		-6.03				
KFM09B	55.00	75.00	3.53E-06	0	1	6.4E-10	5.0E-04	1.32E-06	1.32E-06	77.73	1		-4.01	200	1000		
KFM09B	75.00	95.00	4.28E-06	0	1	7.8E-10	5.0E-04	1.45E-06	1.45E-06	54.71	1		-4.75	100	450		
KFM09B	95.00	115.00	2.59E-07	0	1	6.8E-10	5.0E-04	3.56E-07	3.56E-07	44.60	0		-5.44				
KFM09B	115.00	135.00	1.14E-06	0	0	9.8E-10	5.0E-04	1.10E-06	1.10E-06	78.28	1						
KFM09B	135.00	155.00	1.51E-08	0	1	7.4E-10	5.0E-04	8.61E-08	8.61E-08	21.79	0			300	1200		
KFM09B	155.00	175.00	1.42E-07	0	1	7.9E-10	5.0E-04	2.64E-07	2.64E-07	38.37	-1						
KFM09B	175.00	195.00	1.90E-09	0	1	1.0E-09	5.0E-04	3.05E-08	3.05E-08	13.03	0						
KFM09B	195.00	215.00		-1	0	2.5E-10	5.0E-04										
KFM09B	215.00	235.00	7.97E-10	0	1	7.3E-10	5.0E-04	1.98E-08	1.98E-08	10.48	1						
KFM09B	235.00	255.00	4.68E-07	0	1	9.6E-10	5.0E-04	4.79E-07	4.79E-07	51.60	1						
KFM09B	255.00	275.00		-1	0	2.5E-10	5.0E-04										
KFM09B	275.00	295.00	1.30E-09	0	1	6.9E-10	5.0E-04	2.52E-08	2.52E-08	11.80	0	5.23E-11	-2.01	20	1200		
KFM09B	295.00	315.00	4.19E-10	0	1	2.5E-10	5.0E-04	1.43E-08	1.43E-08	6.79	1	4.95E-11	-3.61			300	700
KFM09B	315.00	335.00		-1	0	2.8E-10	5.0E-04										
KFM09B	335.00	355.00		-1	0	2.1E-10	5.0E-04										
KFM09B	355.00	375.00	1.51E-10	0	0	2.3E-10	5.0E-04	1.27E-08	1.27E-08	8.42	1		-5.51				
KFM09B	375.00	395.00	2.93E-08	0	1	8.3E-10	5.0E-04	1.20E-07	1.20E-07	25.68	0		-1.87	40	1200		
KFM09B	395.00	415.00	2.75E-10	0	1	7.1E-10	5.0E-04	1.16E-08	1.16E-08	8.03	1		-5.15				
KFM09B	415.00	435.00		-1	0	2.0E-10	5.0E-04										
KFM09B	435.00	455.00		-1	0	2.6E-10	5.0E-04										
KFM09B	455.00	475.00		-1	0	3.3E-10	5.0E-04										

idcode	secup	seclow	transmissivity_tt	value_type_tt	bc_tt	l_measl_q_s	u_measl_q_s	assumed_s	bc_s	ri	ri_index	c	skin	t1	t2	dte1	dte2
KFM09B	475.00	495.00	1.07E-10	0	1	7.4E-10	5.0E-04	7.25E-09	7.25E-09	6.35							
KFM09B	495.00	515.00		-1	0	2.0E-10	5.0E-04										
KFM09B	505.00	525.00		-1	0	2.0E-10	5.0E-04										
KFM09B	515.00	535.00	7.69E-10	0	1	6.9E-10	5.0E-04	1.94E-08	1.94E-08	10.40	1						
KFM09B	525.50	545.50	8.34E-10	0	1	7.1E-10	5.0E-04	2.02E-08	2.02E-08	10.61	1						
KFM09B	535.00	555.00		-1	0	3.3E-10	5.0E-04										
KFM09B	545.50	565.50		-1	0	3.3E-10	5.0E-04										
KFM09B	565.50	585.50	3.50E-08	0	1	7.5E-10	5.0E-04	1.31E-07	1.31E-07	77.56	0		-6.36			7000	10000
KFM09B	585.50	605.50		-1	0	2.6E-10	5.0E-04										
KFM09B	10.50	15.50	2.42E-06	0	1	8.3E-10	5.0E-04	1.09E-06	1.09E-06	77.45	0		2.47	80	1200		
KFM09B	15.50	20.50	5.57E-06	0	1	9.6E-10	5.0E-04	1.65E-06	1.65E-06	96.04	-1		-5.32				
KFM09B	18.00	23.00	6.22E-06	0	1	8.1E-10	5.0E-04	1.75E-06	1.75E-06	98.73	-1		-4.51				
KFM09B	21.30	26.30	7.64E-08	0	1	6.0E-10	5.0E-04	1.93E-07	1.93E-07	32.65	0		-1.14	700	1200		
KFM09B	24.00	29.00	3.29E-08	0	1	7.9E-10	5.0E-04	1.27E-07	1.27E-07	26.69	-1		-5.28				
KFM09B	29.00	34.00	5.82E-09	0	1	4.3E-10	5.0E-04	5.34E-08	5.34E-08	17.32	-1						
KFM09B	34.00	39.00	1.70E-08	0	1	7.7E-10	5.0E-04	9.13E-08	9.13E-08	22.64	-1		-3.19				
KFM09B	39.00	44.00	5.80E-09	0	1	8.2E-10	5.0E-04	5.33E-08	5.33E-08	17.28	-1		-4.99				
KFM09B	44.00	49.00	2.37E-06	0	1	8.2E-10	5.0E-04	1.08E-06	1.08E-06	77.03	0		1.77	40	1200		
KFM09B	49.00	54.00	8.93E-06	0	1	5.4E-09	5.0E-04	2.09E-06	2.09E-06	108.10	0						
KFM09B	52.75	57.75	9.58E-06	0	1	2.0E-09	5.0E-04	2.17E-06	2.17E-06	109.26	0		-5.32	150	1200		
KFM09B	55.00	60.00	6.86E-10	0	1	1.7E-10	5.0E-04	1.83E-08	1.83E-08	12.31	0		-2.68	30	1800		
KFM09B	60.00	65.00	2.42E-06	0	1	8.1E-10	5.0E-04	1.09E-06	1.09E-06	59.17	1		-4.64	100	700		
KFM09B	65.00	70.00	8.70E-07	0	1	1.1E-09	5.0E-04	6.53E-07	6.53E-07	29.99	-1		-2.05	100	300		
KFM09B	70.00	75.00	5.04E-08	0	1	8.6E-10	5.0E-04	1.57E-07	1.57E-07	29.42	0		-2.93	100	1200		
KFM09B	75.00	80.00	2.77E-06	0	1	1.1E-09	5.0E-04	1.16E-06	1.16E-06	32.70	1		-5.95	100	200		
KFM09B	80.00	85.00	8.50E-09	0	1	9.9E-10	5.0E-04	6.45E-08	6.45E-08	18.98	1						
KFM09B	85.00	90.00	1.84E-09	0	1	8.4E-10	5.0E-04	3.00E-08	3.00E-08	12.91	1		-4.53				
KFM09B	90.00	95.00	5.82E-09	0	1	8.0E-10	5.0E-04	5.34E-08	5.34E-08	17.19	1						
KFM09B	95.00	100.00	4.67E-08	0	1	7.9E-10	5.0E-04	1.51E-07	1.51E-07	29.06	1						
KFM09B	100.00	105.00	1.76E-07	0	1	7.8E-10	5.0E-04	2.94E-07	2.94E-07	40.46	-1		-4.21				
KFM09B	105.00	110.00	2.37E-08	0	1	8.2E-10	5.0E-04	1.08E-07	1.08E-07	24.51	1						

idcode	secup	seclow	transmissivity_tt	value_type_tt	bc_tt	l_measl_q_s	u_measl_q_s	assumed_s	bc_s	ri	ri_index	c	skin	t1	t2	dte1	dte2
KFM09B	110.00	115.00	5.49E-08	0	1	1.3E-09	5.0E-04	1.64E-07	1.64E-07	30.06	0		-5.77	200	1200		
KFM09B	115.00	120.00	1.46E-07	0	1	9.1E-10	5.0E-04	2.67E-07	2.67E-07	38.51	1						
KFM09B	120.00	125.00		-1	0	2.0E-10	5.0E-04										
KFM09B	125.00	130.00	2.49E-07	0	1	9.1E-10	5.0E-04	3.49E-07	3.49E-07	44.10	0						
KFM09B	130.00	135.00	2.93E-07	0	1	8.9E-10	5.0E-04	3.79E-07	3.79E-07	45.96	1						
KFM09B	135.00	140.00	5.07E-10	0	1	7.0E-10	5.0E-04	1.58E-08	1.58E-08	9.35	1						
KFM09B	140.00	145.00	1.94E-10	0	1	1.3E-10	5.0E-04	9.74E-09	9.74E-09	7.39	1	1.99E-11	-1.09				
KFM09B	145.00	150.00	1.36E-08	0	1	8.0E-10	5.0E-04	8.18E-08	8.18E-08	21.36	1						
KFM09B	150.00	155.00		-1	0	2.6E-10	5.0E-04										
KFM09B	155.00	160.00	2.65E-07	0	1	7.9E-10	5.0E-04	3.60E-07	3.60E-07	44.56	0		0.43	600	1200		
KFM09B	160.00	165.00	9.91E-07	0	0	1.0E-09	5.0E-04	3.36E-07	3.36E-07	43.32	0		14.91	100	1800		
KFM09B	165.00	170.00	1.32E-07	0	0	8.6E-10	5.0E-04	5.55E-07	5.55E-07	55.63	-1		-5.99				
KFM09B	170.00	175.00		-1	0	2.6E-10	5.0E-04										
KFM09B	175.00	180.00		-1	0	2.0E-10	5.0E-04										
KFM09B	180.00	185.00	1.53E-09	0	1	6.9E-10	5.0E-04	2.73E-08	2.73E-08	13.72	0		-4.16			200	1500
KFM09B	185.00	190.00	1.08E-09	0	1	6.9E-10	5.0E-04	2.30E-08	2.30E-08	11.29	1						
KFM09B	190.00	195.00	1.19E-09	0	1	7.6E-10	5.0E-04	2.41E-08	2.41E-08	10.52	1	1.82E-11	-2.47	30	1000		
KFM09B	215.00	220.00		0	0	8.3E-10	5.0E-04	2.71E-08	2.71E-08	12.36							
KFM09B	220.00	225.00	6.17E-10	0	1	7.8E-10	5.0E-04	1.74E-08	1.74E-08	9.86	0						
KFM09B	225.00	230.00		-1	0	2.6E-10	5.0E-04										
KFM09B	230.00	235.00	5.04E-10	0	1	7.6E-10	5.0E-04	1.57E-08	1.57E-08	9.33	1		-5.25				
KFM09B	235.00	240.00	8.62E-10	0	1	7.8E-10	5.0E-04	2.06E-08	2.06E-08	10.72	0						
KFM09B	240.00	245.00	2.22E-07	0	1	9.6E-10	5.0E-04	3.30E-07	3.30E-07	21.32	1		-4.82	40	300		
KFM09B	245.00	250.00		-1	0	2.6E-10	5.0E-04										
KFM09B	250.00	255.00	6.43E-07	0	1	1.3E-09	5.0E-04	5.61E-07	5.61E-07	55.65	1						
KFM09B	275.00	280.00	2.51E-09	0	1	7.7E-10	5.0E-04	3.51E-08	3.51E-08	8.97	1		-0.74	20	500		
KFM09B	280.00	285.00	3.23E-10	0	1	2.4E-10	5.0E-04	1.26E-08	1.26E-08	3.40	1	1.12E-11	-1.00	10	200		
KFM09B	285.00	290.00		-1	0	2.6E-10	5.0E-04										
KFM09B	290.00	295.00		-1	0	2.0E-10	5.0E-04										
KFM09B	373.00	378.00		-1	0	2.6E-10	5.0E-04										
KFM09B	378.00	383.00	2.62E-08	0	1	7.6E-10	5.0E-04	1.13E-07	1.13E-07	14.42	1		1.10	30	400		
KFM09B	383.00	388.00	2.30E-08	0	1	7.2E-10	5.0E-04	1.06E-07	1.06E-07	24.19	0	5.19E-11	0.07	50	1200		

idcode	secup	seclow	transmissivity_tt	value_type_tt	bc_tt	l_measl_q_s	u_measl_q_s	assumed_s	bc_s	ri	ri_index	c	skin	t1	t2	dte1	dte2
KFM09B	388.00	393.00		-1	0	2.6E-10	5.0E-04										
KFM09B	393.00	398.00		-1	0	2.0E-10	5.0E-04										
KFM09B	475.00	480.00	4.30E-10	0	1	7.8E-10	5.0E-04	1.45E-08	1.45E-08	8.97	1						
KFM09B	480.00	485.00		-1	0	2.6E-10	5.0E-04										
KFM09B	485.00	490.00		-1	0	2.6E-10	5.0E-04										
KFM09B	490.00	495.00		-1	0	2.6E-10	5.0E-04										
KFM09B	515.00	520.00		-1	0	2.6E-10	5.0E-04										
KFM09B	520.00	525.00		-1	0	2.6E-10	5.0E-04										
KFM09B	525.00	530.00	7.58E-10	0	1	6.6E-10	5.0E-04	1.93E-08	1.93E-08	10.39	1		-4.79				
KFM09B	530.00	535.00	2.32E-10	0	1	2.9E-10	5.0E-04	1.07E-08	1.07E-08	7.73	-1	1.42E-11	-1.67				
KFM09B	564.50	569.50	7.48E-08	0	0	8.2E-10	5.0E-04	1.09E-07	1.09E-07	24.73	1						
KFM09B	569.50	574.50	9.65E-09	0	1	1.2E-09	5.0E-04	6.88E-08	6.88E-08	19.59	1						
KFM09B	574.50	579.50		-1	0	2.0E-10	5.0E-04										
KFM09B	579.50	584.50		-1	0	2.0E-10	5.0E-04										
KFM09B	584.50	589.50		-1	0	2.6E-10	5.0E-04										
KFM09B	55.00[1)]	60.00															
KFM09B	160.00[1)]	165.00															
KFM09B	215.00[1)]	220.00															
KFM09B	255.00[1)]	355.00															
KFM09B	255.00[1)]	355.00															
KFM09B	507.00[1)]	607.00															
KFM09B	564.50[1)]	569.50															

KFM09B plu_s_hole_test_obs (This result table to SICADA includes more columns which are empty, these columns are not presented here.)

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KFM09B	20060209 14:28	20060209 16:28	55.00	155.00	54.00	54.00	503.76	505.12	504.58				
KFM09B	20060209 14:28	20060209 16:28	55.00	155.00	156.00	616.45				1302.08	1301.67	1301.11	
KFM09B	20060210 07:19	20060210 09:07	155.00	255.00	55.00	154.00	504.27	504.41	504.69				
KFM09B	20060210 07:19	20060210 09:07	155.00	255.00	256.00	616.45				2098.38	2098.65	2098.93	
KFM09B	20060210 11:13	20060210 13:01	255.00	355.00	55.00	254.00	488.55	488.00	487.46				
KFM09B	20060210 11:13	20060210 13:01	255.00	355.00	356.00	616.45				2877.48	2876.93	2876.38	
KFM09B	20060210 13:47	20060210 15:35	355.00	455.00	55.00	354.00	459.42	457.64	457.10				
KFM09B	20060210 13:47	20060210 15:35	355.00	455.00	456.00	616.45				3635.95	3635.12	3634.58	
KFM09B	20060213 09:33	20060213 11:23	455.00	555.00	55.00	454.00	403.50	402.68	402.14				
KFM09B	20060213 09:33	20060213 11:23	455.00	555.00	556.00	616.45				4346.00	4345.45	4344.90	
KFM09B	20060213 14:06	20060213 15:58	507.00	607.00	55.00	506.00	362.54	361.99	361.85				
KFM09B	20060213 14:06	20060213 15:58	507.00	607.00	608.00	616.45				5218.64	5217.40	5216.99	
KFM09B	20060215 13:24	20060215 15:07	55.00	75.00	55.00	54.00	503.87	508.24	506.60				
KFM09B	20060215 13:24	20060215 15:07	55.00	75.00	76.00	616.45				666.86	672.23	668.37	
KFM09B	20060215 15:33	20060215 16:52	75.00	95.00	55.00	74.00	525.53	533.73	523.89				
KFM09B	20060215 15:33	20060215 16:52	75.00	95.00	96.00	616.45				830.96	829.58	827.38	
KFM09B	20060215 17:22	20060215 18:39	95.00	115.00	55.00	94.00	522.33	520.55	518.36				
KFM09B	20060215 17:22	20060215 18:39	95.00	115.00	116.00	616.45				993.14	990.93	988.59	
KFM09B	20060216 07:23	20060216 08:41	115.00	135.00	55.00	114.00	507.92	507.37	507.37				
KFM09B	20060216 07:23	20060216 08:41	115.00	135.00	136.00	616.45				1147.06	1147.06	1146.50	
KFM09B	20060216 09:03	20060216 10:20	135.00	155.00	55.00	134.00	510.59	508.95	507.86				
KFM09B	20060216 09:03	20060216 10:20	135.00	155.00	156.00	616.45				1310.06	1308.28	1306.62	
KFM09B	20060216 10:38	20060216 11:58	155.00	175.00	55.00	154.00	506.16	505.62	505.07				
KFM09B	20060216 10:38	20060216 11:58	155.00	175.00	176.00	616.45				1469.63	1469.21	1468.94	
KFM09B	20060216 12:48	20060216 14:07	175.00	195.00	55.00	174.00	502.28	501.46	501.18				
KFM09B	20060216 12:48	20060216 14:07	175.00	195.00	196.00	616.45				1627.26	1626.57	1626.30	

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KFM09B	20060216 14:33	20060216 15:28	195.00	215.00	55.00	194.00	498.81	498.39	498.39				
KFM09B	20060216 14:33	20060216 15:28	195.00	215.00	216.00	616.45				1784.21	1783.93	1783.66	
KFM09B	20060216 16:02	20060216 17:24	215.00	235.00	55.00	214.00	495.06	494.52	494.52				
KFM09B	20060216 16:02	20060216 17:24	215.00	235.00	236.00	616.45				1939.92	1939.92	1939.92	
KFM09B	20060217 08:34	20060117 09:54	235.00	255.00	55.00	234.00	1363.65	1294.89	783.73				Pa out of order
KFM09B	20060217 08:34	20060117 09:54	235.00	255.00	256.00	616.45				2098.24	2098.38	2098.38	
KFM09B	20060217 10:18	20060217 11:39	255.00	275.00	55.00	254.00	782.31	729.95	708.76				Pa out of order
KFM09B	20060217 10:18	20060217 11:39	255.00	275.00	276.00	616.45				2261.78	2260.14	2259.58	
KFM09B	20060217 12:39	20060217 13:58	275.00	295.00	55.00	274.00	-1893.00	-1710.74	0.00				Pa out of order
KFM09B	20060217 12:39	20060217 13:58	275.00	295.00	296.00	616.45				2412.55	2412.01	2412.01	
KFM09B	20060217 14:20	20060217 15:37	295.00	315.00	55.00	294.00	-2658.49	-2730.68	0.00				Pa out of order
KFM09B	20060217 14:20	20060217 15:37	295.00	315.00	316.00	616.45				2567.16	2566.74	2566.06	
KFM09B	20060217 16:02	20060217 17:17	315.00	335.00	55.00	314.00	-2898.34	-2893.14	0.00				Pa out of order
KFM09B	20060217 16:02	20060217 17:17	315.00	335.00	336.00	616.45				2721.08	2720.66	2720.12	
KFM09B	20060221 10:56	20060221 12:27	335.00	355.00	55.00	334.00	430.16	429.75	429.75				
KFM09B	20060221 10:56	20060221 12:27	335.00	355.00	356.00	616.45				2876.38	2876.38	2875.83	
KFM09B	20060221 12:45	20060221 14:02	355.00	375.00	55.00	354.00	422.35	421.25	420.70				
KFM09B	20060221 12:45	20060221 14:02	355.00	375.00	376.00	616.45				3027.69	3027.14	3026.59	
KFM09B	20060221 14:24	20060221 15:47	375.00	395.00	55.00	374.00	412.34	411.51	411.10				
KFM09B	20060221 14:24	20060221 15:47	375.00	395.00	396.00	616.45				3177.90	3178.04	3177.90	
KFM09B	20060221 16:09	20060221 17:26	395.00	415.00	55.00	394.00	402.46	401.64	400.96				
KFM09B	20060221 16:09	20060221 17:26	395.00	415.00	416.00	616.45				3327.56	3327.56	3327.56	
KFM09B	20060222 08:52	20060222 09:35	415.00	435.00	55.00	414.00	380.94	380.54	380.40				
KFM09B	20060222 08:52	20060222 09:35	415.00	435.00	436.00	616.45				3473.36	3473.36	3473.36	
KFM09B	20060222 10:03	20060222 10:48	435.00	455.00	55.00	434.00	368.75	368.33	368.06				
KFM09B	20060222 10:03	20060222 10:48	435.00	455.00	456.00	616.45				3621.37	3621.37	3621.37	
KFM09B	20060222 11:06	20060222 13:12	455.00	475.00	55.00	454.00	354.63	353.53	352.98				
KFM09B	20060222 11:06	20060222 13:12	455.00	475.00	476.00	616.45				3769.93	3769.37	3769.37	
KFM09B	20060222 13:30	20060222 14:50	475.00	495.00	55.00	474.00	340.23	339.13	338.45				
KFM09B	20060222 13:30	20060222 14:50	475.00	495.00	496.00	616.45				3915.19	3914.91	3914.63	
KFM09B	20060222 15:14	20060222 15:57	495.00	515.00	55.00	494.00	323.65	323.38	322.83				
KFM09B	20060222 15:14	20060222 15:57	495.00	515.00	516.00	616.45				4058.51	4058.24	4058.79	

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KFM09B	20060222 16:12	20060222 16:59	505.00	525.00	55.00	504.00	314.14	313.60	314.01				
KFM09B	20060222 16:12	20060222 16:59	505.00	525.00	526.00	616.45				4133.21	4133.07	4133.07	
KFM09B	20060223 08:37	20060223 09:55	515.00	535.00	55.00	514.00	292.95	291.31	291.31				
KFM09B	20060223 08:37	20060223 09:55	515.00	535.00	536.00	616.45				4195.10	4194.69	4194.14	
KFM09B	20060223 10:10	20060223 11:25	525.50	545.50	55.00	524.50	282.49	280.85	280.85				
KFM09B	20060223 10:10	20060223 11:25	525.50	545.50	546.50	616.45				4270.76	4270.63	4270.63	
KFM09B	20060223 11:42	20060223 13:03	535.00	555.00	55.00	534.00	271.44	270.76	270.76				
KFM09B	20060223 11:42	20060223 13:03	535.00	555.00	556.00	616.45				4337.75	4337.75	4337.75	
KFM09B	20060223 13:24	20060223 14:12	545.50	565.50	55.00	544.50	260.43	259.74	259.74				
KFM09B	20060223 13:24	20060223 14:12	545.50	565.50	566.50	616.45				4411.48	4411.48	4411.48	
KFM09B	20060223 14:29	20060223 15:47	565.50	585.50	55.00	564.50	239.18	237.68	236.99				
KFM09B	20060223 14:29	20060223 15:47	565.50	585.50	586.50	616.45				4935.55	4929.23	4924.82	
KFM09B	20060223 16:09	20060223 16:50	585.50	605.50	55.00	584.50	215.89	215.48	215.34				
KFM09B	20060223 16:09	20060223 16:50	585.50	605.50	606.50	616.45				5166.92	5168.57	5168.57	
KFM09B	20051123 13:55	20051123 15:41	10.50	15.50	9.00	9.50	129.71	129.29	129.29				
KFM09B	20051123 13:55	20051123 15:41	10.50	15.50	16.50	106.00				198.44	198.44	198.44	
KFM09B	20051125 14:49	20051125 16:18	15.50	20.50	9.00	14.50	174.94	176.59	177.70				
KFM09B	20051125 14:49	20051125 16:18	15.50	20.50	21.50	106.00				230.83	230.83	230.29	
KFM09B	20051125 12:55	20051125 14:22	18.00	23.00	9.00	17.00	193.13	195.33	196.98				
KFM09B	20051125 12:55	20051125 14:22	18.00	23.00	24.00	106.00				250.83	251.11	250.56	
KFM09B	20051125 10:24	20051125 11:49	21.30	26.30	9.00	20.30	212.27	212.41	212.96				
KFM09B	20051125 10:24	20051125 11:49	21.30	26.30	27.30	106.00				277.41	276.99	276.85	
KFM09B	20051123 18:10	20051123 19:39	24.00	29.00	9.00	23.00	238.44	238.44	238.85				
KFM09B	20051123 18:10	20051123 19:39	24.00	29.00	30.00	106.00				302.74	302.47	302.06	
KFM09B	20051123 20:38	20051123 22:16	29.00	34.00	9.00	28.00	278.26	278.53	278.53				
KFM09B	20051123 20:38	20051123 22:16	29.00	34.00	35.00	106.00				342.60	342.05	342.05	
KFM09B	20051123 22:58	20051124 00:17	34.00	39.00	9.00	33.00	318.49	318.62	318.76				
KFM09B	20051123 22:58	20051124 00:17	34.00	39.00	40.00	106.00				383.14	382.59	382.04	
KFM09B	20051124 09:12	20051124 10:30	39.00	44.00	9.00	38.00	356.78	356.64	356.78				
KFM09B	20051124 09:12	20051124 10:30	39.00	44.00	45.00	106.00				422.04	421.49	421.49	

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KFM09B	20051124 11:04	20051124 12:53	44.00	49.00	9.00	43.00	396.73	397.00	397.00				
KFM09B	20051124 11:04	20051124 12:53	44.00	49.00	50.00	106.00				460.93	463.54	461.48	
KFM09B	20051124 13:25	20051124 14:41	49.00	54.00	9.00	48.00	436.68	437.77	437.77				
KFM09B	20051124 13:25	20051124 14:41	49.00	54.00	55.00	106.00				502.56	515.03	506.94	
KFM09B	20051124 15:53	20051124 17:11	52.75	57.75	9.00	51.75	466.43	471.94	468.63				
KFM09B	20051124 15:53	20051124 17:11	52.75	57.75	58.75	106.00				534.61	539.41	534.34	
KFM09B	20060313 14:47	20060313 16:02	55.00	60.00	54.00	54.00	516.45	518.50	519.74				
KFM09B	20060313 14:47	20060313 16:02	55.00	60.00	61.00	616.45				546.22	547.46	548.42	
KFM09B	20060227 10:38	20060227 11:54	60.00	65.00	55.00	59.00	526.28	527.24	527.38				
KFM09B	20060227 10:38	20060227 11:54	60.00	65.00	66.00	616.45				589.14	592.44	589.70	
KFM09B	20060227 12:31	20060227 13:48	65.00	70.00	55.00	64.00	535.88	534.79	533.15				
KFM09B	20060227 12:31	20060227 13:48	65.00	70.00	71.00	616.45				632.61	631.51	630.41	
KFM09B	20060227 13:58	20060227 15:14	70.00	75.00	55.00	69.00	529.21	528.51	527.98				
KFM09B	20060227 13:58	20060227 15:14	70.00	75.00	76.00	616.45				670.85	670.30	669.47	
KFM09B	20060227 15:26	20060227 16:42	75.00	80.00	55.00	74.00	527.73	532.11	528.28				
KFM09B	20060227 15:26	20060227 16:42	75.00	80.00	81.00	616.45				708.54	708.68	707.44	
KFM09B	20060228 08:10	20060228 09:24	80.00	85.00	55.00	79.00	522.86	523.27	523.27				
KFM09B	20060228 08:10	20060228 09:24	80.00	85.00	86.00	616.45				744.17	743.20	742.65	
KFM09B	20060228 09:34	20060228 10:50	85.00	90.00	55.00	84.00	523.57	523.57	523.57				
KFM09B	20060228 09:34	20060228 10:50	85.00	90.00	91.00	616.45				783.92	783.37	782.82	
KFM09B	20060228 11:02	20060228 12:17	90.00	95.00	55.00	89.00	523.87	524.00	524.41				
KFM09B	20060228 11:02	20060228 12:17	90.00	95.00	96.00	616.45				824.08	822.98	822.98	
KFM09B	20060228 12:55	20060228 14:09	95.00	100.00	55.00	94.00	523.62	524.17	524.17				
KFM09B	20060228 12:55	20060228 14:09	95.00	100.00	101.00	616.45				864.24	863.14	863.14	
KFM09B	20060228 14:18	20060228 15:32	100.00	105.00	55.00	99.00	523.92	524.47	524.47				
KFM09B	20060228 14:18	20060228 15:32	100.00	105.00	106.00	616.45				904.97	903.87	903.32	
KFM09B	20060228 15:43	20060228 16:58	105.00	110.00	55.00	104.00	523.68	523.68	523.68				
KFM09B	20060228 15:43	20060228 16:58	105.00	110.00	111.00	616.45				944.58	943.48	942.94	
KFM09B	20060301 08:05	20060301 09:22	110.00	115.00	55.00	109.00	522.20	522.20	521.79				
KFM09B	20060301 08:05	20060301 09:22	110.00	115.00	116.00	616.45				984.19	983.37	982.55	
KFM09B	20060301 09:36	20060301 10:50	115.00	120.00	55.00	114.00	522.09	522.09	522.09				
KFM09B	20060301 09:36	20060301 10:50	115.00	120.00	121.00	616.45				1023.81	1022.70	1022.70	

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KFM09B	20060301 11:02	20060301 11:59	120.00	125.00	55.00	119.00	522.94	522.94	522.94				
KFM09B	20060301 11:02	20060301 11:59	120.00	125.00	126.00	616.45				1064.53	1063.98	1063.43	
KFM09B	20060301 12:10	20060301 13:24	125.00	130.00	55.00	124.00	522.14	521.87	522.14				
KFM09B	20060301 12:10	20060301 13:24	125.00	130.00	131.00	616.45				1104.28	1107.44	1108.54	
KFM09B	20060301 13:34	20060301 14:52	130.00	135.00	55.00	129.00	522.99	528.88	529.01				
KFM09B	20060301 13:34	20060301 14:52	130.00	135.00	136.00	616.45				1145.95	1144.85	1143.75	
KFM09B	20060301 15:05	20060301 16:22	135.00	140.00	55.00	134.00	524.66	523.43	522.74				
KFM09B	20060301 15:05	20060301 16:22	135.00	140.00	141.00	616.45				1186.26	1184.75	1183.93	
KFM09B	20060302 07:52	20060302 09:06	140.00	145.00	55.00	139.00	520.85	520.45	520.31				
KFM09B	20060302 07:52	20060302 09:06	140.00	145.00	146.00	616.45				1224.23	1223.55	1222.99	
KFM09B	20060302 09:18	20060302 10:32	145.00	150.00	55.00	144.00	520.62	520.62	520.62				
KFM09B	20060302 09:18	20060302 10:32	145.00	150.00	151.00	616.45				1263.29	1262.60	1262.06	
KFM09B	20060302 10:59	20060302 11:45	150.00	155.00	55.00	149.00	520.64	520.36	520.36				
KFM09B	20060302 10:59	20060302 11:45	150.00	155.00	156.00	616.45				1303.31	1302.91	1302.77	
KFM09B	20060302 11:54	20060302 13:08	155.00	160.00	55.00	154.00	520.39	520.12	520.12				
KFM09B	20060302 11:54	20060302 13:08	155.00	160.00	161.00	616.45				1343.49	1342.93	1342.39	
KFM09B	20060313 12:45	20060313 14:04	160.00	165.00	55.00	159.00	522.20	523.15	523.71				
KFM09B	20060313 12:45	20060313 14:04	160.00	165.00	166.00	616.45				1384.89	1385.85	1386.40	
KFM09B	20060302 14:08	20060302 15:25	165.00	170.00	55.00	164.00	519.08	519.08	518.53				
KFM09B	20060302 14:08	20060302 15:25	165.00	170.00	171.00	616.45				1424.91	1424.36	1424.36	
KFM09B	20060303 07:47	20060303 08:31	170.00	175.00	55.00	169.00	558.35	558.49	557.94				
KFM09B	20060303 07:47	20060303 08:31	170.00	175.00	176.00	616.45				1464.53	1464.26	1464.53	
KFM09B	20060303 08:56	20060303 09:44	175.00	180.00	55.00	174.00	557.97	557.83	557.70				
KFM09B	20060303 08:56	20060303 09:44	175.00	180.00	181.00	616.45				1504.15	1504.15	1504.15	
KFM09B	20060303 09:57	20060303 11:13	180.00	185.00	55.00	179.00	557.46	557.18	556.91				
KFM09B	20060303 09:57	20060303 11:13	180.00	185.00	186.00	616.45				1543.77	1543.77	1543.77	
KFM09B	20060303 11:28	20060303 13:26	185.00	190.00	55.00	184.00	556.53	556.53	556.11				
KFM09B	20060303 11:28	20060303 13:26	185.00	190.00	191.00	616.45				1583.38	1583.38	1583.38	
KFM09B	20060303 13:39	20060303 14:55	190.00	195.00	55.00	189.00	515.93	515.67	515.11				
KFM09B	20060303 13:39	20060303 14:55	190.00	195.00	196.00	616.45				1623.13	1622.58	1622.44	
KFM09B	20060313 10:12	20060313 11:35	215.00	220.00	55.00	214.00	512.38	513.88	514.98				
KFM09B	20060313 10:12	20060313 11:35	215.00	220.00	221.00	616.45				1810.07	1811.71	1812.82	

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KFM09B	20060306 08:24	20060306 09:42	220.00	225.00	55.00	219.00	513.91	513.64	513.64				
KFM09B	20060306 08:24	20060306 09:42	220.00	225.00	226.00	616.45				1860.41	1860.41	1860.13	
KFM09B	20060306 09:53	20060306 10:40	225.00	230.00	55.00	224.00	513.12	512.84	512.84				
KFM09B	20060306 09:53	20060306 10:40	225.00	230.00	231.00	616.45				1900.17	1899.75	1899.75	
KFM09B	20060306 10:49	20060306 12:52	230.00	235.00	55.00	229.00	512.18	511.91	512.04				
KFM09B	20060306 10:49	20060306 12:52	230.00	235.00	236.00	616.45				1939.36	1939.36	1939.36	
KFM09B	20060306 13:01	20060306 14:21	235.00	240.00	55.00	234.00	511.39	511.25	511.25				
KFM09B	20060306 13:01	20060306 14:21	235.00	240.00	241.00	616.45				1978.98	1978.98	1978.98	
KFM09B	20060306 14:32	20060306 15:50	240.00	245.00	55.00	239.00	510.46	509.78	509.91				
KFM09B	20060306 14:32	20060306 15:50	240.00	245.00	246.00	616.45				2018.05	2018.33	2018.05	
KFM09B	20060306 16:06	20060306 17:02	245.00	250.00	55.00	244.00	509.80	509.12	509.12				
KFM09B	20060306 16:06	20060306 17:02	245.00	250.00	251.00	616.45				2057.66	2057.11	2057.11	
KFM09B	20060307 08:40	20060307 09:59	250.00	255.00	55.00	249.00	506.55	506.14	506.14				
KFM09B	20060307 08:40	20060307 09:59	250.00	255.00	256.00	616.45				2096.31	2096.73	2096.73	
KFM09B	20060307 10:33	20060307 11:51	275.00	280.00	55.00	274.00	504.22	503.13	502.17				
KFM09B	20060307 10:33	20060307 11:51	275.00	280.00	281.00	616.45				2296.32	2295.36	2294.81	
KFM09B	20060307 12:50	20060307 14:05	280.00	285.00	55.00	279.00	500.28	499.73	499.19				
KFM09B	20060307 12:50	20060307 14:05	280.00	285.00	286.00	616.45				2331.67	2331.67	2331.12	
KFM09B	20060307 14:20	20060307 15:20	285.00	290.00	55.00	284.00	498.39	498.12	497.84				
KFM09B	20060307 14:20	20060307 15:20	285.00	290.00	291.00	616.45				2370.73	2370.18	2370.18	
KFM09B	20060307 15:32	20060307 16:17	290.00	295.00	55.00	289.00	497.05	496.92	497.05				
KFM09B	20060307 15:32	20060307 16:17	290.00	295.00	296.00	616.45				2408.84	2408.84	2408.70	
KFM09B	20060308 08:14	20060308 08:57	373.00	378.00	55.00	372.00	467.89	467.89	467.35				
KFM09B	20060308 08:14	20060308 08:57	373.00	378.00	379.00	616.45				3042.82	3042.68	3043.09	
KFM09B	20060308 09:11	20060308 10:28	378.00	383.00	55.00	377.00	466.00	466.00	466.00				
KFM09B	20060308 09:11	20060308 10:28	378.00	383.00	384.00	616.45				3082.70	3086.70	3086.56	
KFM09B	20060308 10:42	20060308 11:58	383.00	388.00	55.00	382.00	464.11	463.98	464.11				
KFM09B	20060308 10:42	20060308 11:58	383.00	388.00	389.00	616.45				3122.74	3122.32	3122.32	
KFM09B	20060308 12:43	20060308 13:24	388.00	393.00	55.00	387.00	462.09	461.68	461.68				
KFM09B	20060308 12:43	20060308 13:24	388.00	393.00	394.00	616.45				3159.74	3159.47	3159.74	
KFM09B	20060308 13:46	20060308 14:28	393.00	398.00	55.00	392.00	460.07	459.79	459.79				
KFM09B	20060308 13:46	20060308 14:28	393.00	398.00	399.00	616.45				3196.33	3196.05	3196.05	

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KFM09B	20060308 15:17	20060308 16:33	475.00	480.00	55.00	474.00	412.95	411.59	410.76				
KFM09B	20060308 15:17	20060308 16:33	475.00	480.00	481.00	616.45				3811.75	3811.19	3810.65	
KFM09B	20060309 08:34	20060309 09:25	480.00	485.00	55.00	479.00	405.32	405.05	405.05				
KFM09B	20060309 08:34	20060309 09:25	480.00	485.00	486.00	616.45				3837.60	3837.60	3837.05	
KFM09B	20060309 09:42	20060309 10:30	485.00	490.00	55.00	484.00	402.33	402.06	402.06				
KFM09B	20060309 09:42	20060309 10:30	485.00	490.00	491.00	616.45				3875.57	3875.57	3875.01	
KFM09B	20060309 10:43	20060309 11:35	490.00	495.00	55.00	489.00	398.53	398.39	398.53				
KFM09B	20060309 10:43	20060309 11:35	490.00	495.00	496.00	616.45				3911.88	3911.88	3911.88	
KFM09B	20060309 12:05	20060309 13:34	515.00	520.00	55.00	514.00	378.14	377.59	377.59				
KFM09B	20060309 12:05	20060309 13:34	515.00	520.00	521.00	616.45				4094.00	4094.14	4094.00	
KFM09B	20060309 13:48	20060309 14:42	520.00	525.00	55.00	519.00	373.52	373.11	372.97				
KFM09B	20060309 13:48	20060309 14:42	520.00	525.00	526.00	616.45				4131.41	4131.00	4130.87	
KFM09B	20060309 14:56	20060309 16:17	525.00	530.00	55.00	524.00	369.02	368.35	368.35				
KFM09B	20060309 14:56	20060309 16:17	525.00	530.00	531.00	616.45				4164.29	4164.15	4163.88	
KFM09B	20060309 16:41	20060309 17:59	530.00	535.00	55.00	529.00	364.26	363.72	363.72				
KFM09B	20060309 16:41	20060309 17:59	530.00	535.00	536.00	616.45				4197.30	4196.90	4196.90	
KFM09B	20060310 14:19	20060310 15:35	564.50	569.50	55.00	563.50	329.61	329.34	329.89				
KFM09B	20060310 14:19	20060310 15:35	564.50	569.50	570.50	616.45				4434.45	4625.51	4595.25	
KFM09B	20060310 09:45	20060310 11:11	569.50	574.50	55.00	568.50	324.72	324.72	324.72				
KFM09B	20060310 09:45	20060310 11:11	569.50	574.50	575.50	616.45				4822.48	4823.04	4814.23	
KFM09B	20060310 11:24	20060310 12:07	574.50	579.50	55.00	573.50	319.81	319.40	319.54				
KFM09B	20060310 11:24	20060310 12:07	574.50	579.50	580.50	616.45				4777.50	4777.22	4776.82	
KFM09B	20060310 12:17	20060310 12:59	579.50	584.50	55.00	578.50	314.50	314.23	314.37				
KFM09B	20060310 12:17	20060310 12:59	579.50	584.50	585.50	616.45				4914.38	4914.78	4914.38	
KFM09B	20060310 13:17	20060310 14:00	584.50	589.50	55.00	583.50	308.92	308.64	308.64				
KFM09B	20060310 13:17	20060310 14:00	584.50	589.50	590.50	616.45				4856.60	4862.66	4862.10	
KFM09B	20060227 09:46	20060227 10:28	55.00	60.00	57.00	54.00	518.62	518.89	518.48				Incomplete test, interrupted and reperformed later.
KFM09B	20060227 09:46	20060227 10:28	55.00	60.00	61.00	618.45				549.94	549.66	549.52	Incomplete test, interrupted and reperformed later.
KFM09B	20060302 13:18	20060302 13:55	160.00	165.00	58.00	159.00	519.88	519.74	519.88				Incomplete test, interrupted and reperformed later.
KFM09B	20060302 13:18	20060302 13:55	160.00	165.00	166.00	619.45				1383.51	1383.37	1383.10	Incomplete test, interrupted and reperformed later.

idcode	start_date	stop_date	secup	seclow	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KFM09B	20060303 15:23	20060303 16:39	215.00	220.00	59.00	214.00	512.93	512.24	511.69				Incomplete test, interrupted and reperformed later.
KFM09B	20060303 15:23	20060303 16:39	215.00	220.00	221.00	620.45				1821.62	1821.07	1820.52	Incomplete test, interrupted and reperformed later.
KFM09B	20060210 10:06	20060210 10:57	255.00	355.00	60.00	254.00	491.15	490.60	490.74				Incomplete test, interrupted and reperformed later.
KFM09B	20060210 10:06	20060210 10:57	255.00	355.00	356.00	621.45				2880.23	2880.23	2880.23	Incomplete test, interrupted and reperformed later.
KFM09B	20060210 10:59	20060210 11:11	255.00	355.00	61.00	254.00	489.64	489.64	489.64				Incomplete test, interrupted and reperformed later.
KFM09B	20060210 10:59	20060210 11:11	255.00	355.00	356.00	622.45				2879.13	2879.13	2879.13	Incomplete test, interrupted and reperformed later.
KFM09B	20060213 12:25	20060213 13:37	507.00	607.00	62.00	506.00	363.08	362.81	362.41				Incomplete test, interrupted and reperformed later.
KFM09B	20060213 12:25	20060213 13:37	507.00	607.00	608.00	623.45				5216.85	5216.85	5216.99	Incomplete test, interrupted and reperformed later.
KFM09B	20060310 08:50	20060310 09:33	564.50	569.50	63.00	563.50	330.57	330.30	330.43				Incomplete test, interrupted and reperformed later.
KFM09B	20060310 08:50	20060310 09:33	564.50	569.50	570.50	624.45				4438.43	4562.92	4555.64	Incomplete test, interrupted and reperformed later.