P-06-201

Oskarshamn site investigation

Hydraulic injection tests in borehole KLX11A

Subarea Laxemar

Cristian Enachescu, Stephan Rohs, Philipp Wolf
Golder Associates GmbH

September 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

ISSN 1651-4416
SKB P-06-201

Oskarshamn site investigation

Hydraulic injection tests in borehole KLX11A

Subarea Laxemar

Cristian Enachescu, Stephan Rohs, Philipp Wolf
Golder Associates GmbH

September 2006

Keywords: Site/project, Hydrogeology, Hydraulic tests, Injection test, Hydraulic parameters, Transmissivity, Constant head.

Abstract

Hydraulic injection tests have been performed in Borehole KLX11A at the Laxemar area, Oskarshamn. The tests are part of the general program for site investigations and specifically for the Laxemar sub-area. The hydraulic testing programme has the aim to characterise the rock with respect to its hydraulic properties of the fractured zones and rock mass between them. Data is subsequently delivered for the site descriptive model.

This report describes the results and primary data evaluation of the hydraulic injection tests in borehole KLX11A performed between 29th of June and 11th of August 2006.

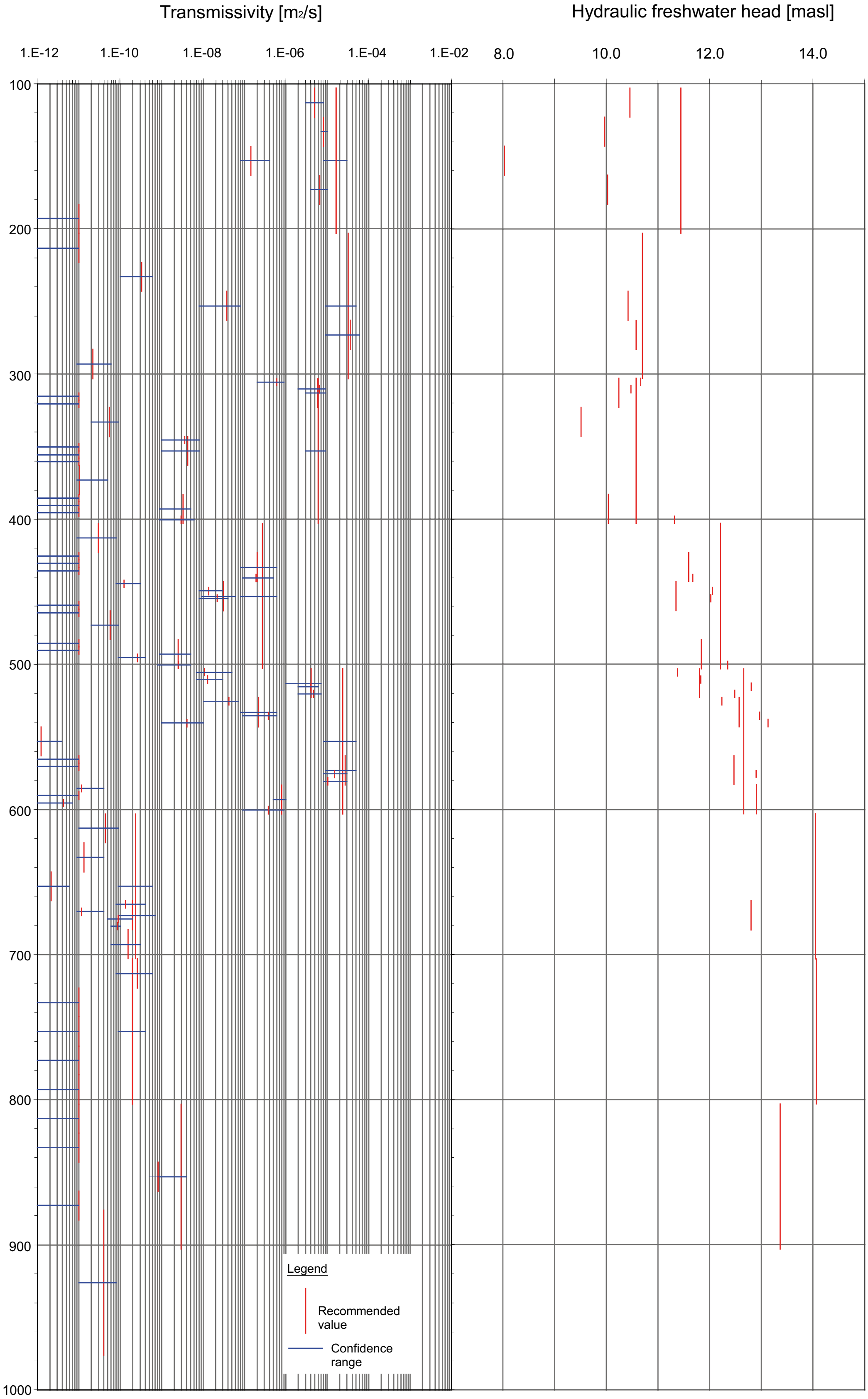
The objective of the hydrotests was to describe the rock around the borehole with respect of hydraulic parameters, mainly transmissivity (T) and hydraulic conductivity (K) at different measurement scales of 100 m, 20 m and 5 m sections. Transient evaluation during flow and recovery period provided additional information such as flow regimes, hydraulic boundaries and cross-over flows. Constant pressure injection tests were conducted between 103.00–976.00 m below ToC. The results of the test interpretation are presented as transmissivity, hydraulic conductivity and hydraulic freshwater head.

Sammanfattning

Injektionstester har utförts i borrhål KLX11A i delområde Laxemar, Oskarshamn. Testerna är en del av SKB:s platsundersökningar. Hydraultestprogrammet där injektionstesterna ingår har som mål att karakterisera berget med avseende på dess hydrauliska egenskaper av sprickzoner och mellanliggande bergmassa. Data från testerna används vid den platsbeskrivande modelleringen av området.

Denna rapport redovisar resultaten och utvärderingar av primärdata de hydrauliska injektionstesterna i borrhål KLX11A. Testerna utfördes mellan den 29 juni till den 11 augusti 2006.

Syftet med hydraultesterna var framförallt att beskriva bergets hydrauliska egenskaper runt borrhålet med avseende på hydrauliska parametrar, i huvudsak transmissvitet (T) och hydraulisk konduktivitet (K) vid olika mätskalor av 100 m, 20 m och 5 m sektioner. Transient utvärdering under injektions- och återhämntningsfasen gav ytterligare information avseende flödesgeometri, hydrauliska gränser och sprickläckage. Injektionstester utfördes mellan 103,00–976,00 m borrhålslängd. Resultaten av testutvärderingen presenteras som transmissivitet, hydraulisk konduktivitet och grundvattennivå uttryckt i ekvivalent sötvattenpelare (fresh-water head).



Borehole KLX11A – summary of results.

Contents

1 Introduction

A general program for site investigations presenting survey methods has been prepared /SKB 2001/, as well as a site-specific program for the investigations in the Simpevarp area /SKB 2005/. The hydraulic injection tests form part of the site characterization program under item 1.1.5.8 in the work breakdown structure of the execution programme, /SKB 2002/.

Measurements were carried out according in borehole KLX11A during 29th of June and 11th of August 2006 following the methodology described in SKB MD 323.001 and in the activity plan AP PS 400-06-072 (SKB controlling documents). Data and results were delivered to the SKB site characterisation database SICADA and are traceable by the activity plan number.

The hydraulic testing programme has the aim to characterise the rock with respect to its hydraulic properties of the fractured zones and rock mass between them. This report describes the results and primary data evaluation of the hydraulic injection tests in borehole KLX11A. The commission was conducted by Golder Associates AB and Golder Associates GmbH.

Borehole KLX11A is situated in the Laxemar area approximately 2.5 km west of the nuclear power plant of Simpevarp, Figure 1-1. The borehole was drilled from November 2005 to March 2006 at 992.29 m length with an inner diameter of 76 mm and an inclination of –76.43°. The upper 12.05 m is cased with large diameter telescopic casing ranging from diameter (outer diameter) 208 mm–323 mm.

The work was carried out in accordance with activity plan AP PS 400-06-072. In Table 1-1 controlling documents for performing this activity are listed. Both activity plan and method descriptions are SKB's internal controlling documents. Measurements were conducted utilising SKB's custom made testing equipment PSS2.

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

Activity plan	**Number**	**Version**
Hydraulic injection tests in borehole KLX11A	AP PS 400-06-072	1.0
Method descriptions	**Number**	**Version**
Hydraulic injection tests	SKB MD 323.001	1.0
Instruktion för rengöring av borrhålsutrustning och viss markbaserad utrustning	SKB MD 600.004	1.0
Instruktion för längdkalibrering vid undersökningar I kärnborrhål	SKB MD 620.010	1.0
Allmäna ordning-, skydds- och miljöregler för platsundersökningar Oskarshamn	SKB SDPO-003	1.0
Miljökontrollprogram Platsundersökningar	SKB SDP-301	1.0
Hantering av primärdata vid platsundersökningar	SKB SDP-508	1.0

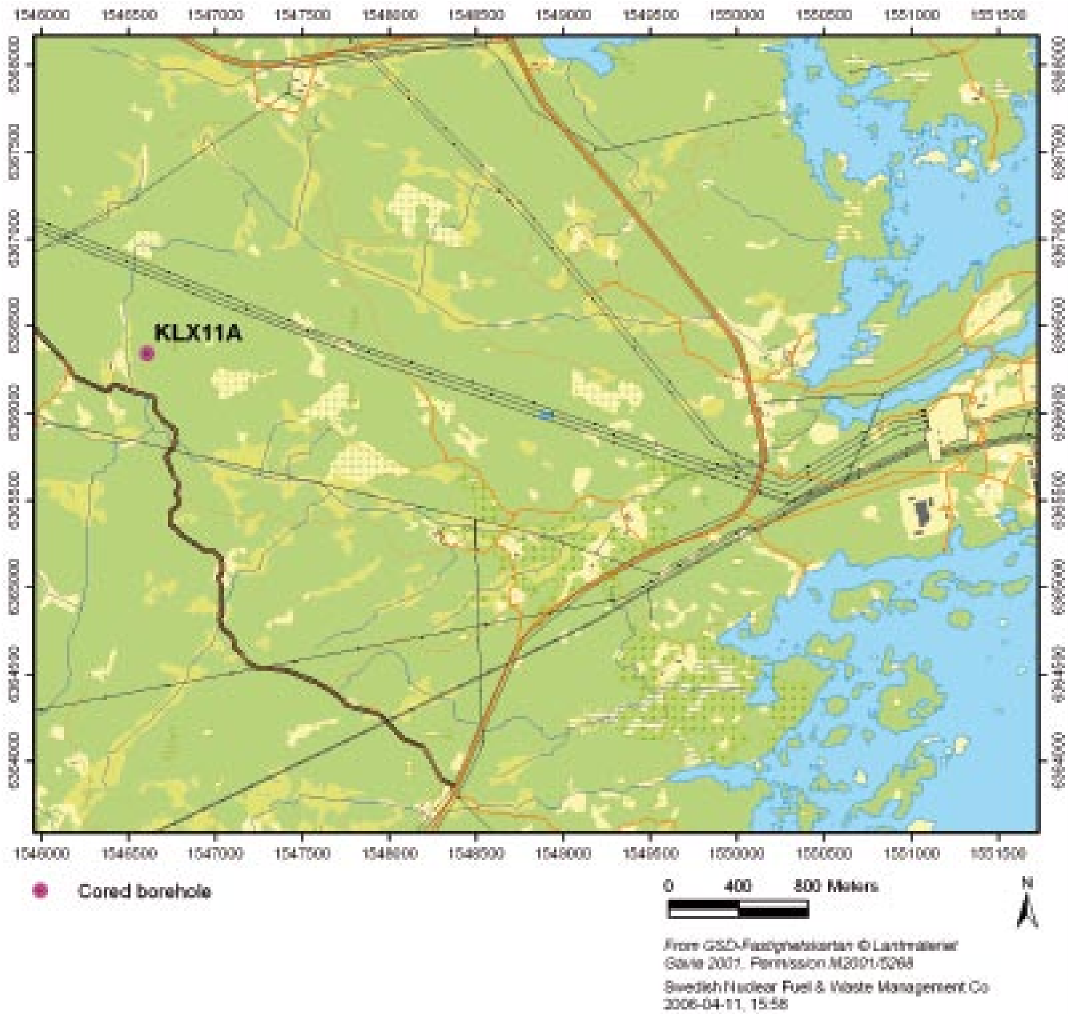


Figure 1-1. *The investigation area Laxemar, Oskarshamn with location of borehole KLX11A.*

2 Objective

The objective of the hydrotests in borehole KLX11A is to describe the rock around the borehole with respect to hydraulic parameters, mainly transmissivity (T) and hydraulic conductivity (K). This is done at different measurement scales of 100 m, 20 m and 5 m sections. Among these parameters transient evaluation during the flow and recovery period provides additional information such as flow regimes, hydraulic boundaries and cross-over flows.

3 Scope of work

The scope of work consisted of preparation of the PSS2 tool which included cleaning of the down-hole tools, calibration and functional checks, injection tests of 100 m, 20 m and 5 m test sections, analyses and reporting.

Preparation for testing was done according to the Quality plan. This step mainly consists of functions checks of the equipment to be used, the PSS2 tool. Calibration checks and function checks were documented in the daily log and/or relevant documents.

The following hydraulic injection tests were performed between 29th June and 11th August 2006 (Table 3-1).

3.1 Borehole

The borehole is telescope drilled with specifications on its construction according to Table 3-2. The reference point of the borehole is the centre of top of casing (ToC), given as elevation in table below. The Swedish National coordinate system (RT90) is used in the x-y direction and RHB70 in the z-direction. Northing and Easting refer to the top of the boreholes at the ground surface. The borehole diameter in Table 3-2 refers to the final diameter of the drill bit after drilling to full depth.

Table 3-1. Performed injection tests at borehole KLX11A.

No. of injection tests*	Interval	Positions	Time/test	Total test time
9	100 m	103.00–976.00 m	125 min	18.75 hrs
39	20 m	103.00–883.00 m	90 min	58.50 hrs
45	5 m	303.00–683.00 m	90 min	67.50 hrs
			Total:	144.75 hrs

* excluding repeated tests and additional over night pulse injections.

Table 3-2. Information about KLX11A (from SICADA 2006-06-07).

Title	Value				
Borehole length (m):	992.290				
Reference level:	TOC				
Drilling Period (s):	From Date	To Date	Secup (m)	Seclow (m)	Drilling Type
	2005-11-01	2005-11-08	0.430	100.060	Percussion drilling
	2005-11-24	2006-03-02	100.060	992.290	Core drilling
Starting point coordinate:	Length (m)	Northing (m)	Easting (m)	Elevation (m.a.s.l.)	Coord System
(centerpoint of TOC)	0.000	6366339.716	1546608.490	27.143	RT90-RHB70 Measured
Angles:	Length (m)	Bearing	Inclination (– = down)		
	0.000	89.840	–76.434	RT90-RHB70 Measured	
Borehole diameter:	Secup (m)	Seclow (m)	Hole Diam (m)		
	0.430	9.600	0.343		
	9.600	12.050	0.248		
	12.050	99.960	0.195		
	99.960	100.060	0.160		
	100.060	101.530	0.086		
	101.530	992.290	0.076		
Core diameter:	Secup (m)	Seclow (m)	Core Diam (m)		
	100.060	100.530	0.072		
	100.530	992.290	0.050		
Casing diameter:	Secup (m)	Seclow (m)	Case In (m)	Case Out (m)	
	0.000	12.050	0.200	0.208	
	0.430	9.600	0.310	0.323	
Grove milling:	Length (m)	Trace detectable			
	110.000	YES			
	150.000	YES			
	200.000	YES			
	250.000	YES			
	300.000	YES			
	350.000	YES			
	400.000	YES			
	450.000	YES			
	500.000	YES			
	550.000	YES			
	600.000	YES			
	650.000	YES			
	700.000	YES			
	750.000	YES			
	800.000	YES			
	850.000	YES			
	900.000	YES			
	944.000	YES			
	974.000	YES			

3.2 Injection tests

Injection tests were conducted according to the Activity Plan AP PS 400-06-072 and the method description for hydraulic injection tests, SKB MD 323.001 (SKB internal documents). Tests were done in 100 m test sections between 103.00–976.00 m below ToC, in 20 m test sections between 103.00–883.00 m below ToC and in 5 m test sections between 303.00–683.00 m (see Table 3-3). The initial criteria for performing injection tests in 20 m and 5 m test sections was a measurable flow of Q > 0.001 L/min in the previous measured 100 m tests covering the smaller test sections (see Figure 3-1). The measurements were performed with SKBs custom made equipment for hydraulic testing called PSS2.

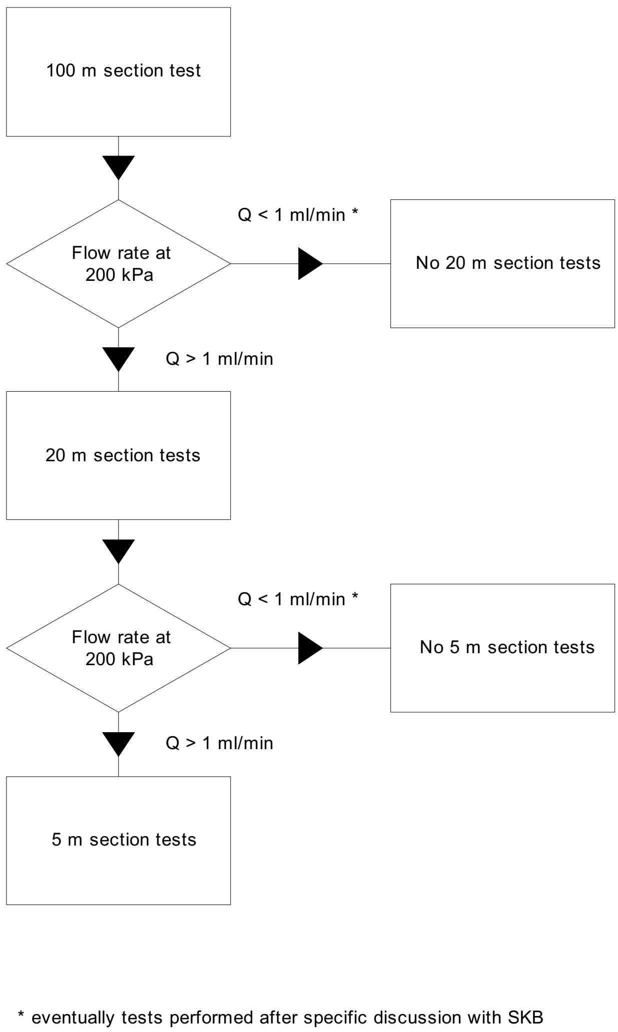


Figure 3-1. *Flow chart for test sections.*

Table 3-3. Tests performed.

Bh ID	Test section (m bToC)	Test type[1]	Test no	Test start Date, Time	Test stop Date, Time
KLX11A	103.00–203.00	3	1	060629 14:32:00	060629 16:40:00
KLX11A	203.00–303.00	3	1	060629 18:03:00	060629 20:21:00
KLX11A	303.00–403.00	3	1	060630 09:15:00	060630 11:12:00
KLX11A	403.00–503.00	3	1	060630 13:11:00	060630 15:20:00
KLX11A	503.00–603.00	3	1	060701 08:47:00	060701 10:50:00
KLX11A	603.00–703.00	3	1	060701 12:14:00	060701 15:43:00
KLX11A	703.00–803.00	3	1	060701 17:09:00	060702 01:32:00
KLX11A	803.00–903.00	3	1	060702 09:11:00	060702 13:33:00
KLX11A	876.00–976.00	4B	1	060702 14:45:00	060702 16:49:00
KLX11A	103.00–123.00	3	1	060704 08:19:00	060704 09:46:00
KLX11A	123.00–143.00	3	1	060704 10:31:00	060704 11:54:00
KLX11A	143.00–163.00	3	1	060704 12:49:00	060704 14:32:00
KLX11A	163.00–183.00	3	1	060704 15:05:00	060704 16:33:00
KLX11A	183.00–203.00	3	1	060704 17:12:00	060704 18:14:00
KLX11A	203.00–223.00	3	1	060704 18:50:00	060704 19:46:00
KLX11A	223.00–243.00	4B	1	060705 08:38:00	060705 10:07:00
KLX11A	243.00–263.00	3	1	060705 10:48:00	060705 12:22:00
KLX11A	263.00–283.00	3	1	060705 13:18:00	060705 14:44:00
KLX11A	283.00–303.00	4B	1	060705 15:25:00	060705 16:51:00
KLX11A	303.00–323.00	3	1	060705 17:25:00	060705 18:49:00
KLX11A	323.00–343.00	3	1	060705 19:21:00	060706 00:42:00
KLX11A	343.00–363.00	3	1	060706 08:48:00	060706 10:30:00
KLX11A	363.00–383.00	4B	1	060706 11:03:00	060706 12:55:00
KLX11A	383.00–403.00	3	1	060706 13:34:00	060706 15:02:00
KLX11A	403.00–423.00	4B	1	060706 15:54:00	060706 17:22:00
KLX11A	423.00–443.00	3	1	060706 17:56:00	060706 19:21:00
KLX11A	443.00–463.00	3	1	060707 08:32:00	060707 10:01:00
KLX11A	463.00–483.00	4B	1	060707 10:33:00	060707 12:34:00
KLX11A	483.00–503.00	3	1	060707 13:12:00	060707 14:44:00
KLX11A	503.00–523.00	3	1	060707 15:12:00	060707 16:39:00
KLX11A	523.00–543.00	3	1	060707 17:07:00	060707 18:30:00
KLX11A	543.00–563.00	4B	1	060707 19:07:00	060708 08:26:00
KLX11A	563.00–583.00	3	1	060708 08:58:00	060708 10:21:00
KLX11A	583.00–603.00	3	1	060708 10:53:00	060708 12:23:00
KLX11A	603.00–623.00	4B	1	060708 13:17:00	060708 14:41:00
KLX11A	623.00–643.00	4B	1	060708 15:12:00	060708 16:39:00
KLX11A	643.00–663.00	4B	1	060708 17:11:00	060708 18:34:00
KLX11A	663.00–683.00	3	1	060708 19:06:00	060709 08:39:00
KLX11A	683.00–703.00	4B	1	060709 09:11:00	060709 10:40:00
KLX11A	703.00–723.00	3	1	060709 11:08:00	060709 13:27:00
KLX11A	723.00–743.00	4B	1	060709 13:58:00	060709 15:13:00
KLX11A	743.00–763.00	4B	1	060709 15:45:00	060709 16:56:00
KLX11A	763.00–783.00	4B	1	060709 17:25:00	060709 18:10:00
KLX11A	783.00–803.00	4B	1	060709 18:43:00	060709 20:01:00
KLX11A	803.00–823.00	3	1	060710 08:19:00	060710 09:15:00
KLX11A	823.00–843.00	3	1	060710 09:45:00	060710 10:37:00
KLX11A	843.00–863.00	3	1	060710 11:10:00	060710 13:24:00
KLX11A	863.00–883.00	3	1	060710 14:04:00	060710 14:56:00
KLX11A	303.00–308.00	3	1	060712 07:38:00	060712 09:06:00
KLX11A	308.00–313.00	3	1	060712 09:30:00	060712 10:51:00

Bh ID	Test section (m bToC)	Test type[1]	Test no	Test start Date, Time	Test stop Date, Time
KLX11A	313.00–318.00	3	1	060712 11:13:00	060712 12:03:00
KLX11A	318.00–323.00	3	1	060712 13:09:00	060712 13:57:00
KLX11A	343.00–348.00	3	1	060712 14:31:00	060712 16:11:00
KLX11A	348.00–353.00	3	1	060712 16:38:00	060712 17:38:00
KLX11A	353.00–358.00	3	1	060712 17:56:00	060712 18:45:00
KLX11A	358.00–363.00	3	1	060713 07:52:00	060713 08:41:00
KLX11A	383.00–388.00	3	1	060713 09:14:00	060713 10:05:00
KLX11A	388.00–393.00	3	1	060713 10:28:00	060713 11:17:00
KLX11A	393.00–398.00	3	1	060713 12:29:00	060713 13:20:00
KLX11A	398.00–403.00	3	1	060713 13:44:00	060713 15:16:00
KLX11A	423.00–428.00	3	1	060713 15:46:00	060713 16:55:00
KLX11A	428.00–433.00	3	1	060713 16:59:00	060713 17:47:00
KLX11A	433.00–438.00	3	1	060714 07:59:00	060714 08:46:00
KLX11A	438.00–443.00	3	1	060714 09:17:00	060714 10:39:00
KLX11A	442.00–447.00	4B	1	060714 11:06:00	060714 12:51:00
KLX11A	447.00–452.00	3	1	060714 13:16:00	060714 14:37:00
KLX11A	452.00–457.00	3	1	060714 15:01:00	060714 16:22:00
KLX11A	457.00–462.00	3	1	060714 16:45:00	060714 17:35:00
KLX11A	462.00–467.00	3	1	060714 18:01:00	060714 18:50:00
KLX11A	483.00–488.00	3	1	060715 08:16:00	060715 09:05:00
KLX11A	488.00–493.00	3	1	060715 09:29:00	060715 10:19:00
KLX11A	493.00–498.00	4B	1	060715 10:47:00	060715 13:39:00
KLX11A	498.00–503.00	3	1	060715 14:04:00	060715 15:29:00
KLX11A	503.00–508.00	3	1	060715 15:53:00	060715 17:47:00
KLX11A	508.00–513.00	3	1	060715 18:09:00	060715 21:14:00
KLX11A	513.00–518.00	3	1	060716 08:05:00	060716 10:33:00
KLX11A	513.00–518.00	3	2	060807 09:04:00	060807 11:01:00
KLX11A	513.00–518.00	3	3	060808 15:30:00	060808 17:15:00
KLX11A	518.00–523.00	3	1	060808 17:47:00	060808 19:37:00
KLX11A	523.00–528.00	3	1	060809 08:08:00	060809 09:41:00
KLX11A	528.00–533.00	3	1	060809 10:08:00	060809 11:34:00
KLX11A	533.00–538.00	3	1	060809 12:48:00	060809 14:16:00
KLX11A	538.00–543.00	3	1	060809 14:40:00	060809 16:19:00
KLX11A	563.00–568.00	3	1	060809 16:59:00	060809 17:53:00
KLX11A	568.00–573.00	3	1	060809 18:17:00	060809 19:11:00
KLX11A	573.00–578.00	3	1	060810 08:06:00	060810 09:34:00
KLX11A	578.00–583.00	3	1	060810 10:02:00	060810 11:28:00
KLX11A	583.00–588.00	4B	1	060810 12:20:00	060810 14:15:00
KLX11A	588.00–593.00	4B	1	060810 14:41:00	060810 16:05:00
KLX11A	593.00–598.00	4B	1	060810 16:33:00	060810 18:19:00
KLX11A	598.00–603.00	3	1	060811 08:01:00	060811 09:26:00
KLX11A	663.00–668.00	3	1	060811 10:29:00	060811 13:01:00
KLX11A	668.00–673.00	4B	1	060811 13:30:00	060811 15:14:00
KLX11A	673.00–678.00	4B	1	060811 15:38:00	060811 17:22:00
KLX11A	678.00–683.00	4B	1	060811 17:45:00	060811 20:53:00

[1)] 3: Injection test; 4B: Pulse injection test.

No other additional measurements except the actual hydraulic tests and related measurements of packer position and water level in annulus of borehole KLX11A were conducted.

3.3 Control of equipment

Control of equipment was mainly performed according to the Quality plan. The basis for equipment handling is described in the "Mätssystembeskrivning" SKB MD 345.101–123 which is composed of two parts 1) management description, 2) drawings and technical documents of the modified PSS2 tool.

Function checks were performed before and during the tests. Among these pressure sensors were checked at ground level and while running in the hole calculated to the static head. Temperature was checked at ground level and while running in. Leakage checks at joints in the pipe string were done at least every 100 m of running in.

Any malfunction was recorded, and measures were taken accordingly for proper operation. Approval was made according to SKB site manager, or Quality plan and the "Mätssystembeskrivning".

4 Equipment

4.1 Description of equipment

The equipment called PSS2 (Pipe String System 2) is a highly integrated tool for testing boreholes at great depth (see conceptual drawing in the next Figure). The system is built inside a container suitable for testing at any weather. Briefly, the components consists of a hydraulic rig, down-hole equipment including packers, pressure gauges, shut-in tool and level indicator, racks for pump, gauge carriers, breakpins, etc. shelfs and drawers for tools and spare parts.

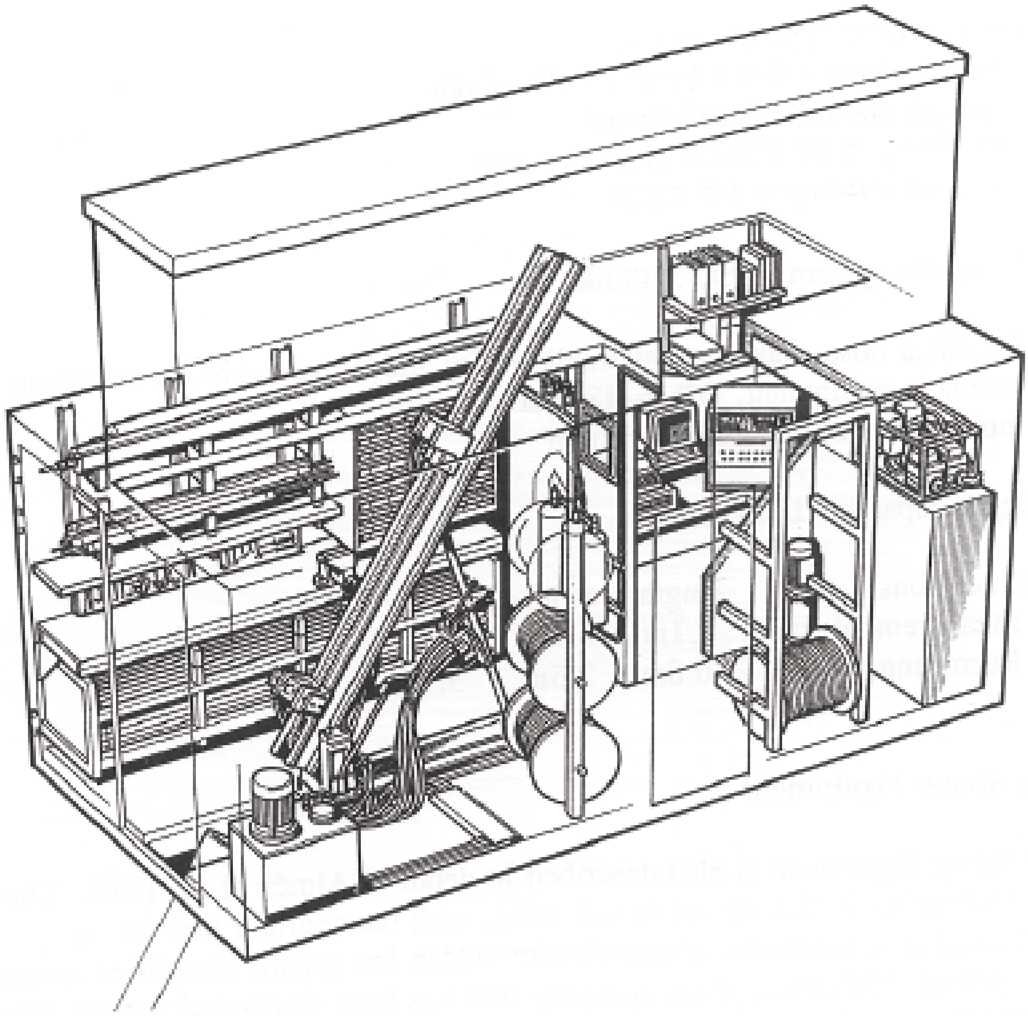


Figure 4-1. *A view of the layout and equipment of PSS2.*

There are three spools for a multi-signal cable, a test valve hose and a packer inflation hose. There is a water tank for injection purposes, pressure vessels for injection of packers, to open test valve and for low flow injection. The PSS2 has been upgraded with a computerized flow regulation system. The office part of the container consists of a computer, regulation valves for the nitrogen system, a 24 V back-up system in case of power shut-offs and a flow regulation board.

PSS2 is documented in photographs 1–6.

Photo 1. *Hydraulic rig.*

Photo 2. *Rack for pump, down-hole equipment, workbench and drawers for tools.*

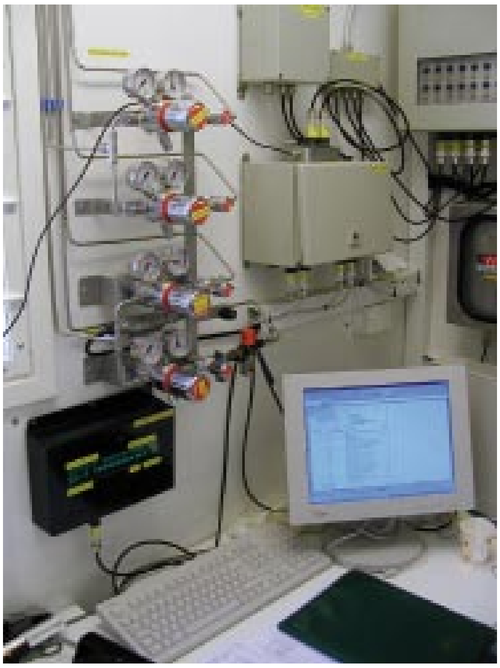


Photo 3. *Computer room, displays and gas regulators.*

Photo 4. *Pressure vessels for test valve, packers and injection.*

Photo 5. *Positioner, bottom end of down-in-hole string.*

Photo 6. *Packer and gauge carrier.*

The down-hole equipment consists from bottom to top of the following equipment:

- Level indicator – SS 630 mm pipe with OD 73 mm with 3 plastic wheels connected to a Hallswitch.
- Gauge carrier – SS 1.5 m carrying bottom section pressure transducer and connections from positioner.
- Lower packer – SS and PUR 1.5 m with OD 72 mm, stiff ends, tightening length 1.0 m, maximum pressure 6.5 MPa, working pressure 1.6 MPa.
- Gauge carrier with breakpin – SS 1.75 m carrying test section pressure transducer, temperature sensor and connections for sensors below. Breakpin with maximum load of 47.3 (± 1.0) kN. The gauge carrier is covered by split pipes and connected to a stone catcher on the top.
- Pop joint – SS 1.0 or 0.5 m with OD 33 mm and ID 21 mm, double O-ring fittings, trapezoid thread, friction loss of 3 kPa/m at 50 L/min.
- Pipe string – SS 3.0 m with OD 33 mm and ID 21 mm, double O-ring fittings, trapezoid thread, friction loss of 3 kPa/m at 50 L/min.
- Contact carrier – SS 1.0 m carrying connections for sensors below and
- Upper packer – SS and PUR 1.5 m with OD 72 mm, fixed ends, seal length 1.0 m, maximum pressure 6.5 MPa, working pressure 1.6 MPa.
- Breakpin – SS 250 mm with OD 33.7 mm. Maximum load of 47.3 (± 1.0) kN.
- Gauge carrier – SS 1.5 m carrying top section pressure transducer, connections from sensors below. Flow pipe is double bent at both ends to give room for sensor equipment. The pipe gauge carrier is covered by split pipes.
- Shut-in tool (test valve) – SS 1.0 m with a OD of 48 mm, Teflon coated valve piston, friction loss of 11 kPa at 10 L/min (260 kPa–50 L/min). Working pressure 2.8–4.0 MPa. Breakpipe with maximum load of 47.3 (± 1.0) kN. The shut-in tool is covered by split pipes and connected to a stone catcher on the top.

The tool scheme is presented in Figure 4-2.

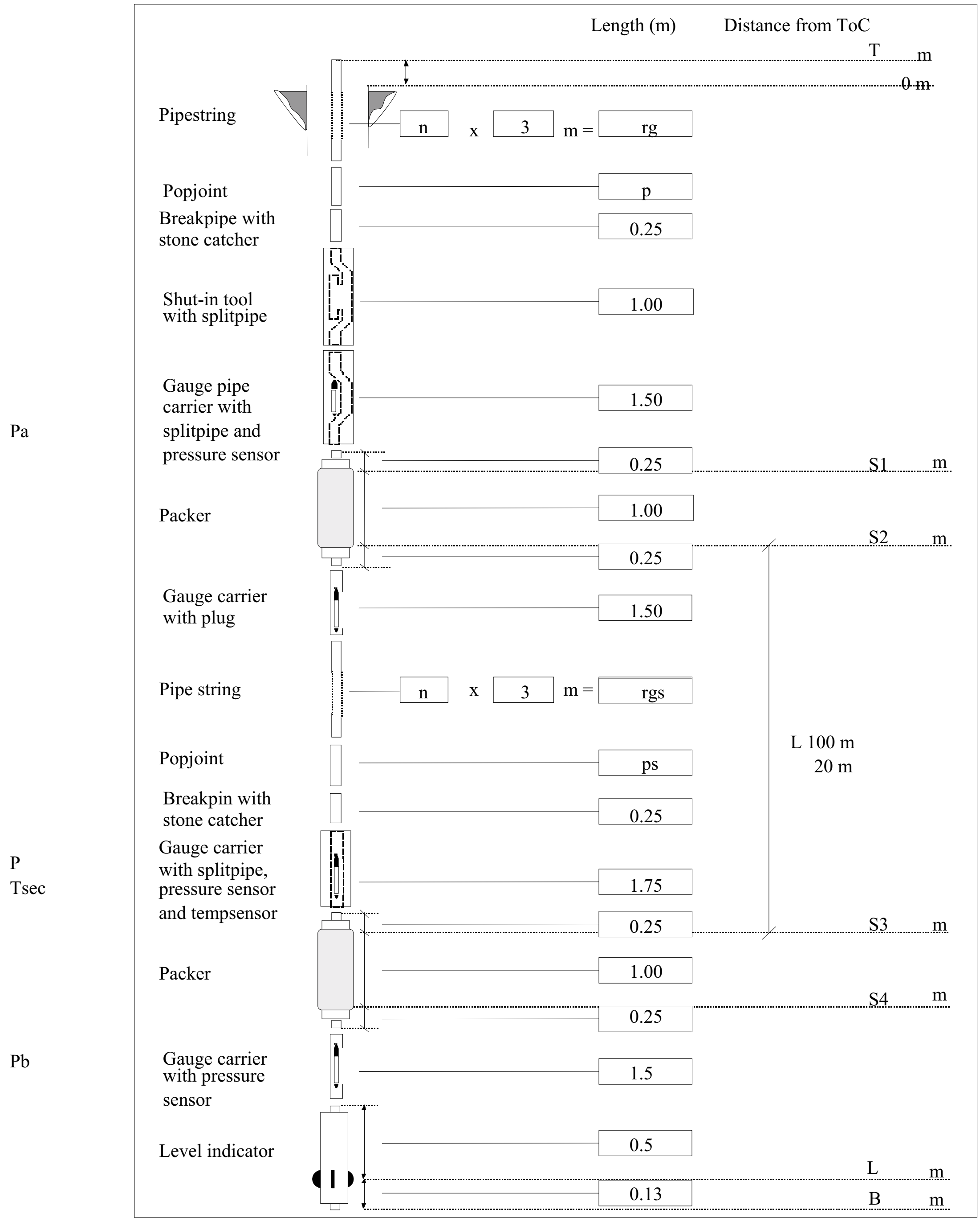


Figure 4-2. *Schematic drawing of the down-hole equipment in the PSS2 system.*

4.2 Sensors

Table 4-1. Technical specifications of sensors.

Keyword	Sensor	Name	Value/Range	Unit	Comments
$P_{sec,a,b}$	Pressure	Druck PTX 162–1464abs	9–30 4–20 0–13.5 +0.1	VDC mA MPa % of FS	
$T_{sec,surf,air}$	Temperature	BGI	18–24 4–20 0–32 +0.1	VDC mA °C °C	
Q_{big}	Flow	Micro motion Elite sensor	0–100 +0.1	kg/min %	Massflow
Q_{small}	Flow	Micro motion Elite sensor	0–1.8 +0.1	kg/min %	Massflow
p_{air}	Pressure	Druck PTX 630	9–30 4–20 0–120 +0.1	VDC mA KPa % of FS	
p_{pack}	Pressure	Druck PTX 630	9–30 4–20 0–4 +0.1	VDC mA MPa % of FS	
$p_{in,out}$	Pressure	Druck PTX 1400	9–28 4–20 0–2.5 +0.15	VDC mA MPa % of FS	
L	Level indicator				Length correction

Table 4-2. Sensor positions and wellbore storage (WBS) controlling factors.

Borehole information			Sensors		Equipment affecting WBS coefficient		
ID	Test section (m)	Test no	Type	Position (m fr ToC)	Position	Function	Outer diameter (mm)
KLX11A	103.00–203.00	1	pa p T pb L	101.11 202.37 202.20 205.01 206.25	Test section	Signal cable Pump string Packer line	9.1 33 6
KLX11A	103.00–123.00	1	pa p T pb L	101.11 122.37 122.20 125.01 126.25	Test section	Signal cable Pump string Packer line	9.1 33 6
KLX11A	303.00–308.00	1	pa p T pb L	301.11 307.37 307.20 310.01 311.25	Test section	Signal cable Pump string Packer line	9.1 33 6

4.3 Data acquisition system

The data acquisition system in the PSS container contains a stationary PC with the software Orchestrator, pump- and injection test parameters such as pressure, temperature and flow are monitored and sensor data collected. A second laptop PC is connected to the stationary PC through a network containing evaluation software, Flowdim. While testing, data from previously tested section is converted with IPPlot and entered in Flowdim for evaluation.

The data acquisition system starts and stops the test automatically or can be disengaged for manual operation of magnetic and regulation valves within the injection/pumping system. The flow regulation board is used for differential pressure and valve settings prior testing and for monitoring valves during actual test. An outline of the data acquisition system is outlined in Figure 4-3.

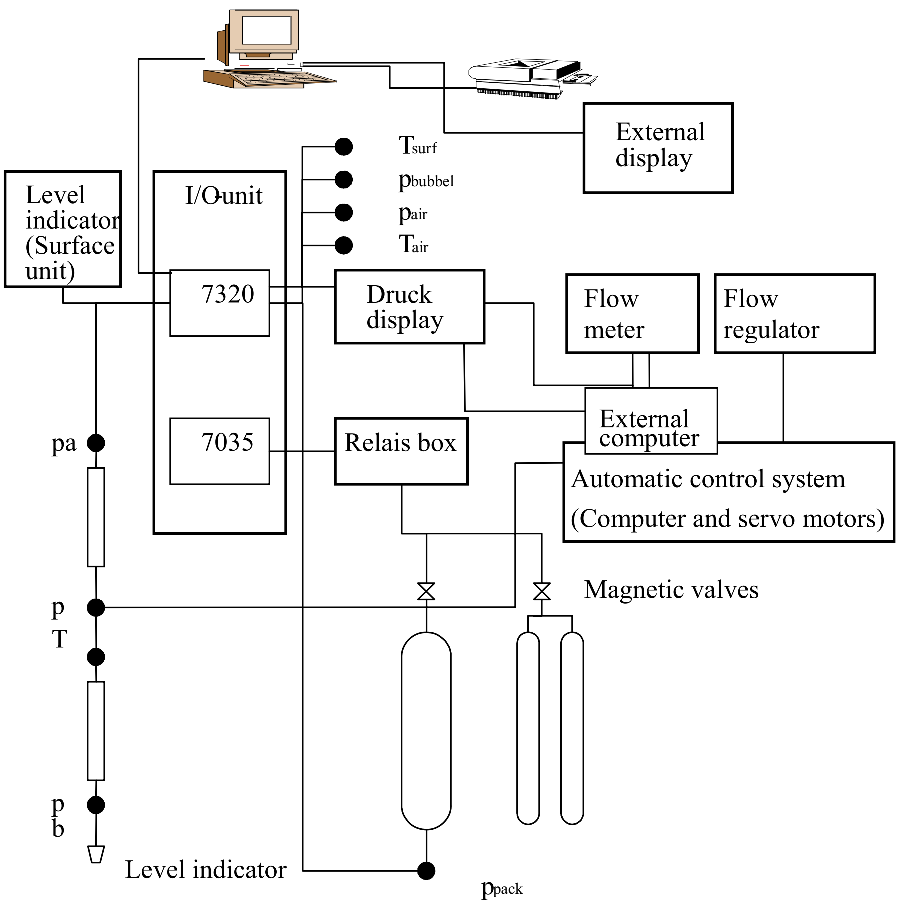


Figure 4-3. Schematic drawing of the data acquisition system and the flow regulation control system in PSS.

5 Execution

5.1 Preparations

Following preparation work and functional checks were conducted prior to starting test activities:

- Place pallets and container, lifting rig up, installing fence on top of container, lifting tent on container.
- Clean and desinfect of Multikabel and hoses for packer and test valve. Clean the tubings with hot steam.
- Filling tank with water and tracer it with Uranin; take water sample from non tracered and tracered water.
- Filling vessels.
- Filling the hoses for test valve and packer.
- Entering calibration constants to system and regulation unit.
- Synchronize clocks on all computers.
- Function check of shut-in tool both ends, overpressure by 900 kPa for 5 min (OK).
- Check pressure gauges against atmospheric pressure and than on test depth against column of water.
- Translate all protocols into English (where necessary).
- Filling packers with water and de-air.
- Measure and assemble test tool.

5.2 Length correction

By running in with the test tool, a level indicator is incorporated at the bottom of the tool. The level indicator is able to record groves milled into the borehole wall. The depths of this groves are given by SKB in the activity plan (see Table 3-2) and the measured depth is counter checked against the number/length of the tubes build in. The achieved correction value, based on linear interpolation between the reference marks, is used to adjust the location of the packers for the testsections to avoid wrong placements and minimize elongation effects of the test string.

5.3 Execution of tests/measurements

5.3.1 Test principle

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a shut-in pressure recovery (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

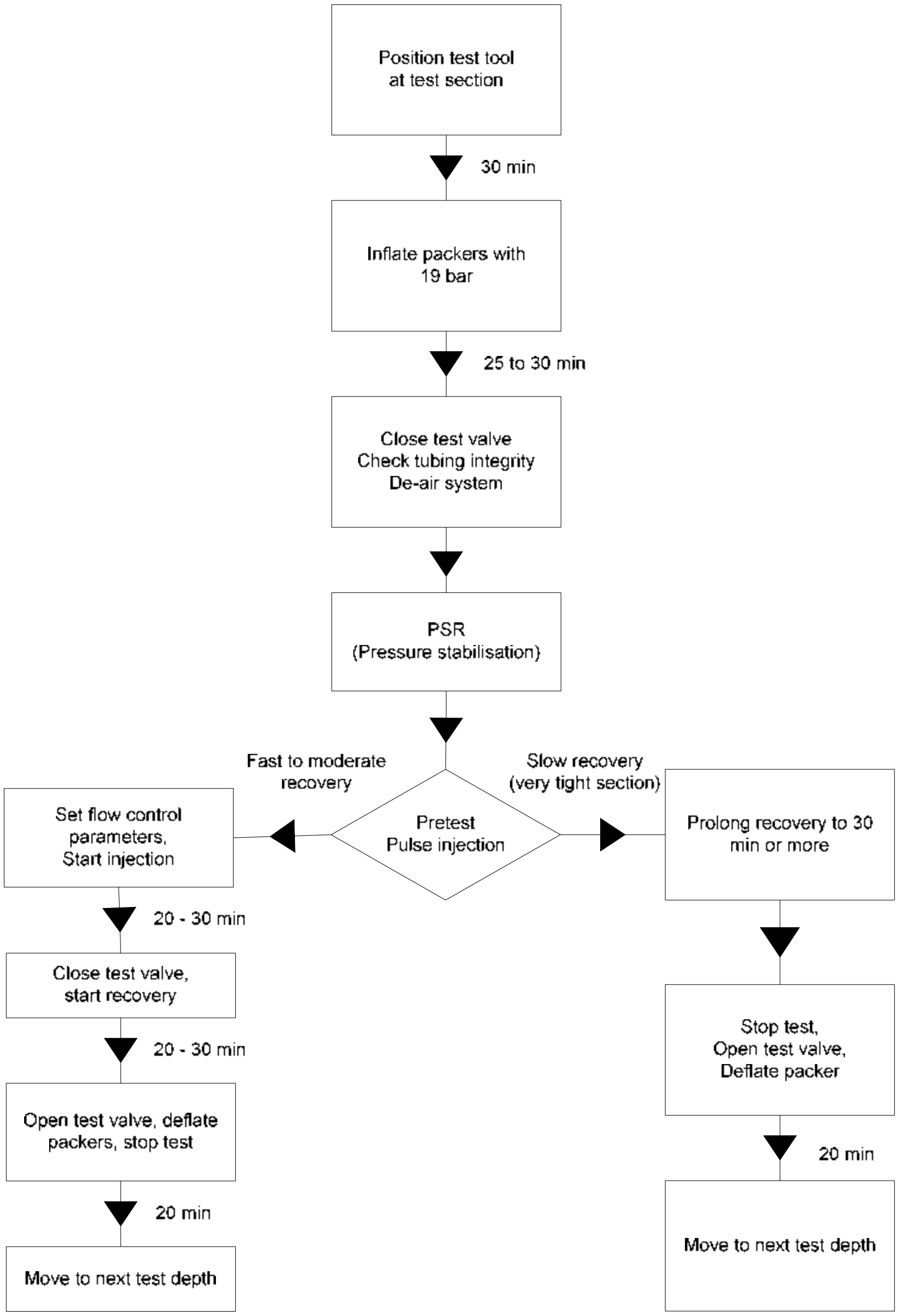


Figure 5-1. *Flow chart for test performance.*

5.3.2 Test procedure

A test cycle includes the following phases: 1) Transfer of down-hole equipment to the next section. 2) Packer inflation. 3) Pressure stabilisation. 4) Pulse injection. 5) Constant head injection. 6) Pressure recovery. 7) Packer deflation. The injection tests in KLX11A has been carried out by applying a constant injection pressure of appr. 200 kPa (20 m water column) above the static formation pressure in the test section. Before start of the injection tests, approximately stable pressure conditions prevailed in the test section. After the injection period, the pressure recovery in the section was measured. In cases, where small flow rates were expected, the automatic regulation unit was switched off and the test was performed manually. In those cases, the constant difference pressure was usually unequal to 200 kPa. In other cases, where the pressure recovery of the pulse injection test took very long, the recovery was extended and the pulse test was taken for the analysis. No injection test was performed in those sections.

The duration for each phase is presented in Table 5-1.

5.4 Data handling

The data handling followed several stages. The data acquisition software (Orchestrator) produced an ASCII raw data file (*.ht2) which contains the data in voltage and milliampere format plus calibration coefficients. The *.ht2 files were processed to *.dat files using the SKB program called IPPlot. These files contain the time, pressure, flow rate and temperature data. The *.dat files were synthesised in Excel to a *.xls file for plotting purposes. Finally, the test data to be delivered to SKB were exported from Excel in *.csv format. These files were also used for the subsequent analysis (field and final) of the injection phase (CHi). The synthesised data of the recovery phase (CHir) was used for the field analysis and to receive preliminary results for concistency reviews.

5.5 Analyses and interpretation

The analyses of the tests is divided in two parts. The first part of the analysis consists of a radial flow analysis. For this analysis a flow dimension of 2 (radial flow) was assumed. The second part is a generalized radial flow analysis (GRF) and the flow dimension was evaluated using the slope of the derivative on the log-log plot of the CHi and CHir test phases.

5.5.1 Analysis software

The tests were analysed using a type curve matching method. The analysis was performed using Golder's test analysis program FlowDim. FlowDim is an interactive analysis environment allowing the user to interpret constant pressure, constant rate and slug/pulse tests in source as well as observation boreholes. The program allows the calculation of type-curves for homogeneous, dual porosity and composite flow models in variable flow geometries from linear to spherical.

Table 5-1. Durations for packer inflation, pressure stabilisation, injection and recovery phase and packer deflation in KLX11A.

Position test tool to new test section (correct position using the borehole markers)	Approx. 30 min
Inflate packers with appr. 1,900 kPa	25 min
Close test valve	10 min
Check tubing integrity with appr. 800 kPa	5 min
De-air system	2 min
Pretest, pulse injection	2–30 min
Set automatic flow control parameters or setting for manual test	5 min
Start injection	20 to 45 min
Close test valve, start recovery	20 min or more
Open test valve	10 min
Deflate packers	25 min
Move to next test depth	–

5.5.2 Analysis approach

Constant pressure tests are analysed using a rate inverse approach. The method initially known as the /Jacob and Lohman 1952/ method was further improved for the use of type curve derivatives and for different flow models.

Constant pressure recovery tests are analysed using the method described by /Gringarten 1986/ and /Bourdet et al. 1989/ by using type curve derivatives calculated for different flow models.

The generalized radial flow analysis is based on the flow model developed by /Barker 1988/. This flow model allows the modelling of flow dimensions between 1 (linear flow) and 3 (spherical flow).

5.5.3 Analysis methodology

Each of the relevant test phases is subsequently analyzed using the following steps:

Injection Tests

- Assumption of a flow dimension 2 (radial flow) for the radial flow analysis. Initial estimates of the model parameters are obtained by conventional straight-line analysis.
- Superposition type curve matching in log-log coordinates. A non-linear regression algorithm is used to provide optimized model parameters in the latter stages.
- Non-linear regression in semi-log coordinates (superposition HORNER plot; /Horner 1951/). In this stage of the analysis, the static formation pressure is selected for regression.
- Identification of the flow model by evaluation of the derivative on the log-log diagnostic plot for the generalized radial flow analysis and superposition type curve matching in log-log coordinates.

The test analysis methodology is best explained in /Horne 1990/.

Pulse Injection Tests

A test cycle always started with a pulse injection test whose goal it was to derive a first estimation of the formation transmissivity. If the pressure recovery of this brief injection was very slow, it indicated a very tight section. It is then decided to extend the recovery time and measure the pressure recovery (PI).

During the brief injection phase a small volume is injected (derived from the flowmeter measurements and/or replacement in injection vessel). This injected volume produces the pressure increase of dp. Using a dV/dp approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity. Figure 5-2 below show an example of a typical pressure versus time evolution for such a tight section.

- Calculation of initial estimates of the model parameters by using the Ramey Plot /Ramey et al. 1975/. This plot is typically not presented in the appendix.
- Assumption of radial flow and type curve analysis in the deconvolution Peres Plot /Peres et al. 1989, Chakrabarty and Enachescu 1997/. A non-linear regression algorithm is used to provide optimized model parameters in the later stages.
- Identification of the flow dimension based on the slope of the derivative and type curve analysis for the generalized radial flow analysis. An Example of the type curves is presented in Figure 5-3

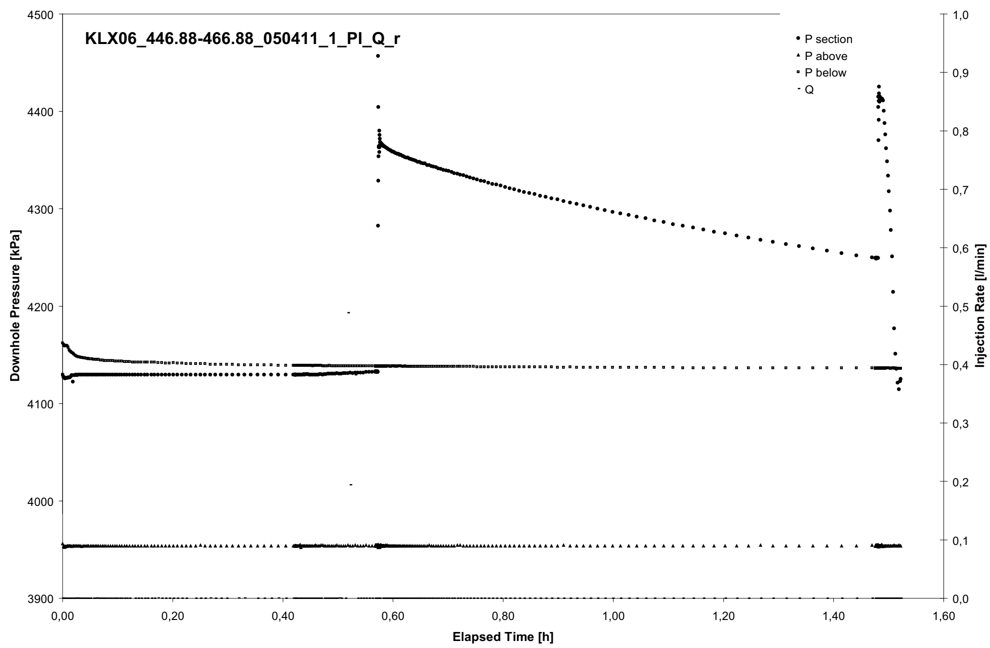


Figure 5-2. *Typical pressure versus time plot of a Pulse injection test.*

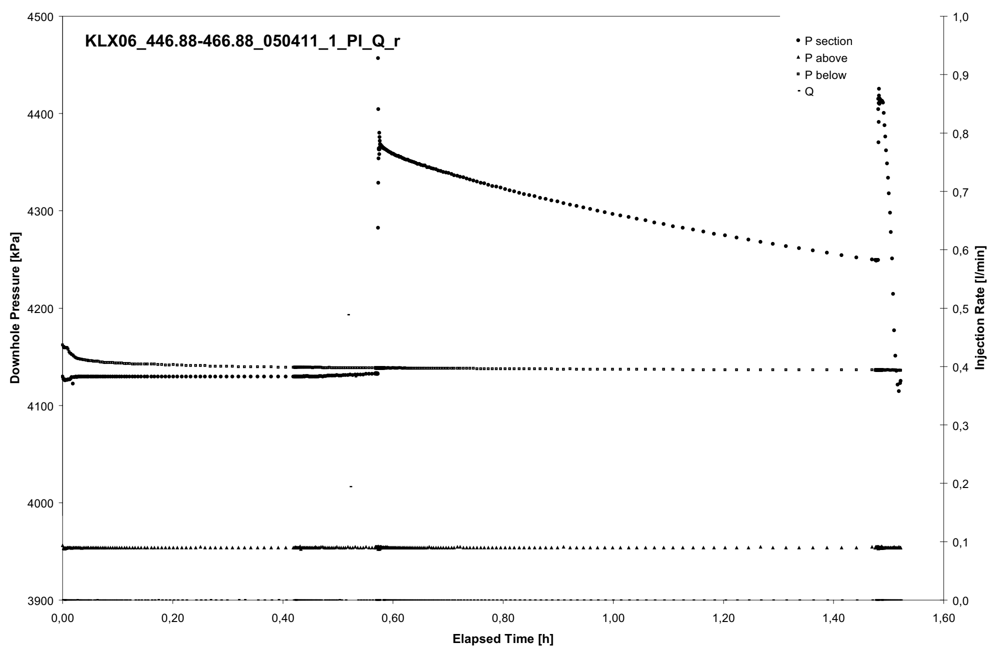


Figure 5-3. *Deconvolution type curve set for pulse test analysis.*

5.5.4 Flow models used for analysis

Radial flow analysis

Analyses were performed with the assumption of radial flow. Changes of the slope in the pressure derivative were interpreted as a change of transmissivity at some distance from the borehole. In such cases a composite radial flow model was used in the analysis.

If there were different flow models matching the data in comparable quality, the simplest model was preferred. The chosen flow model (homogeneous or composite) were commented for each tests.

In cases when the infinite acting radial flow (IARF) phase was not supported by the data the derivative was extrapolated using the most conservative assumption, which is that the derivative would stabilise short time after test end. In such cases the additional uncertainty was accounted for in the estimation of the transmissivity confidence ranges.

Generalized radial flow analysis

The flow models used in analysis were derived from the shape of the pressure derivative calculated with respect to log time and plotted in log-log coordinates.

The flow dimension displayed by the test can be diagnosed from the slope of the pressure derivative. A slope of 0.5 indicates linear flow, a slope of 0 (horizontal derivative) indicates radial flow and a slope of –0.5 indicates spherical flow. In several cases the pressure derivative suggests a change of flow dimension at some distance from the test interval. In such cases a composite flow model was used in the analysis. The flow dimension diagnosis was commented for each of the tests.

In following cases no generalized radial flow analysis was performed:

- data quality (no clear flow model identification was possible due to noise in the recorded data),
- no formation flow stabilization was reached (due to low transmissivity and/or short test time),
- flow dimension calculated by the slope of derivative indicates radial flow (no generalized radial flow analysis was needed).

In such cases it was commented for the relevant tests as well.

The analysis with respect to the flow dimension is limited in some cases. Figure 5-4 shows the analysis of a pulse using a flow dimension of 1 (linear flow).

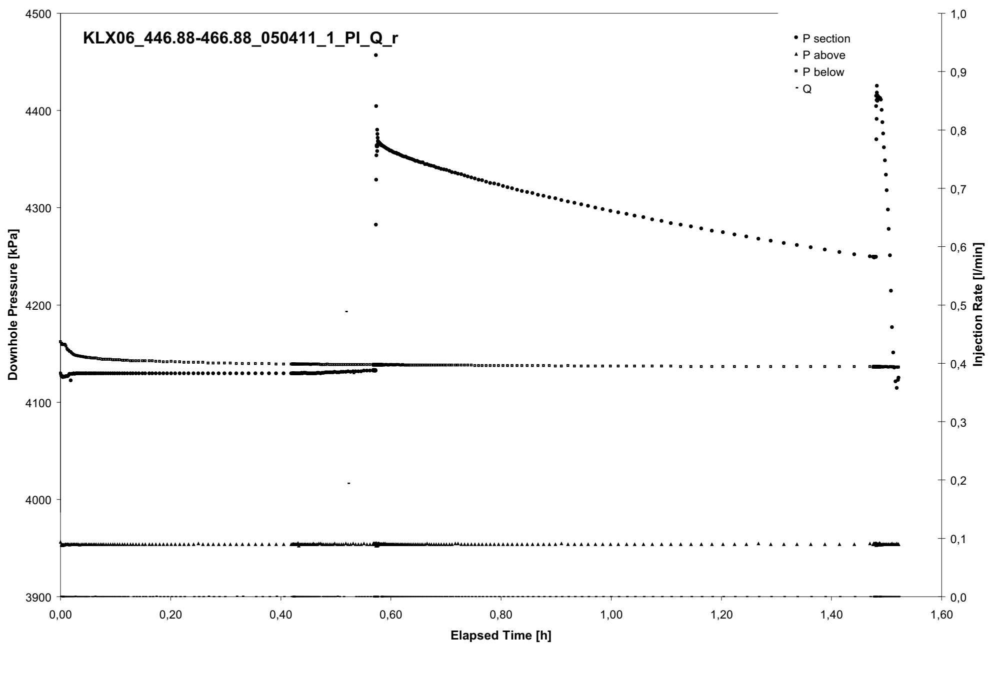


Figure 5-4. *Analysis of a pulse injection test with flow dimension 1. (The arrows indicate the change in parameter when moving the data).*

The log-log coordinates plotted type curve show a continues upward trend with no change in distance between data and derivative type curve. Vertical movement of the data changes the transmissivity and horizontal movement changes the storativity. It is possible to move the plotted data to nearly every position on the type curve and moving the data transposes transmissivity with storativity and vice versa. This shows that under such circumstances the transmissivity and storativity values are strongly correlated.

5.5.5 Steady state analysis

In addition to the type curve analysis, an interpretation based on the assumption of stationary conditions was performed as described by /Moye 1967/.

5.5.6 Calculation of the static formation pressure and equivalent freshwater head

The static formation pressure (p*) measured at transducer depth, was derived from the pressure recovery (CHir) following the constant pressure injection phase by using:

(1) straight line extrapolation in cases infinite acting radial flow (IARF) occurred,

(2) type curve extrapolation in cases infinite acting radial flow (IARF) is unclear or was not reached.

The equivalent freshwater head (expressed in meters above sea level) was calculated from the extrapolated static formation pressure (p*), corrected for athmospheric pressure measured by the surface gauge and corrected for the vertical depth considering the inclination of the drillhole, by assuming a water density of 1,000 kg/m^3 (freshwater). The equivalent freshwater head is the static water level an individual test interval would show if isolated and connected to the surface by tubing full of freshwater. Figure 5-5 shows the methodology schematically.

The freshwater head in meters above sea level is calculated as following:

$$head = \frac{(p^* - p_{atm})}{\rho \cdot g}$$

which is the p* value expressed in a water column of freshwater.

With consideration of the elevation of the reference point (RP) and the gauge depth (Gd), the freshwater head h_{iwf} is:

$$h_{iwf} = RP_{elev} - Gd + \frac{(p^* - p_{atm})}{\rho \cdot g}$$

5.5.7 Derivation of the recommended transmissivity and the confidence range

In most of the cases more than one analysis was conducted on a specific test. Typically both test phases were analysed (CHi and CHir) and in some cases the CHi or the CHir phase was analysed using two different flow models. The parameter sets (i.e. transmissivities) derived from the individual analyses of a specific test usually differ. In the case when the differences are small (which is typically the case) the recommended transmissivity value is chosen from the test phase that shows the best data and derivative quality.

In cases when the difference in results of the individual analyses was large (more than half order of magnitude) the test phases were compared and the phase showing the best derivative quality was selected.

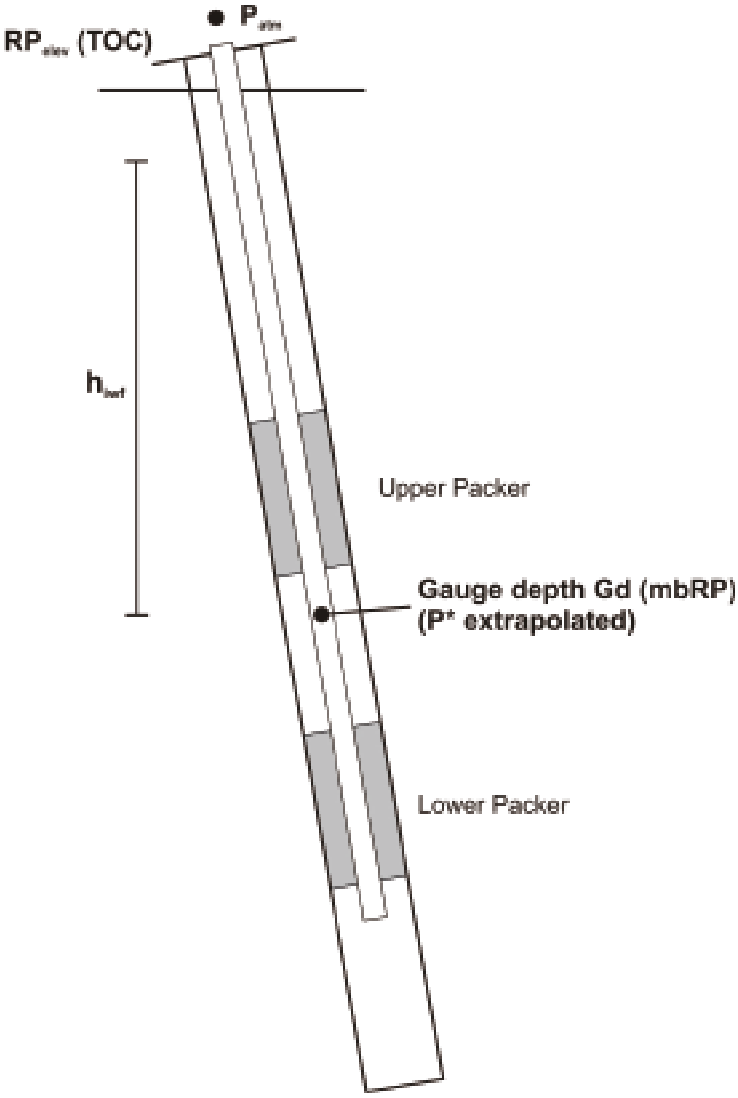


Figure 5-5. *Schematic methodologies for calculation of the freshwater head.*

The confidence range of the transmissivity was derived using expert judgement. Factors considered were the range of transmissivities derived from the individual analyses of the test as well as additional sources of uncertainty such as noise in the flow rate measurement, numeric effects in the calculation of the derivative or possible errors in the measurement of the wellbore storage coefficient. No statistical calculations were performed to derive the confidence range of transmissivity.

In cases when changing transmissivity with distance from the borehole (composite model) was diagnosted, the transmissivity of the zone, which was showing the better derivative quality was recommended.

In cases when the infinite acting radial flow (IARF) phase was not supported by the data the additional uncertainty was accounted for in the estimation of the transmissivity confidence ranges.

5.6 Nonconformities

On 16th of July the automatc regulation system stopped to work. This caused a delay and the testing program was continued on the 8th of August.

6 Results

In the following, results of all tests are presented and analysed. Section 6.1 presents the 100 m tests, 6.2 the 20 m tests and 6.3 the 5 m tests. The results are given as general comments to test pereformance, the identified flow regimes (generalized radial flow analysis) and calculated parameters and finally the parameters which are considered as most representative are chosen and justification is given. The results of the radial flow analysis are summarised in Table 7-1 and Table 7-2 of the Synthesis chapter. Table 7-3 presents the results of the generalized radial flow analysis.

6.1 100 m hydraulic injection tests

In the following, the 100 m section tests conducted in borehole KLX11A are presented and analysed.

6.1.1 Section 103.00–203.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The fast recovery of the pulse test indicated a high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 198 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 13.3 L/min at start of the CHi phase to 7.9 L/min at the end, indicating a high interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the CHi phase shows a relatively flat derivative with a slight downward trend. However, an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a slight downward trend at late times. In case of this analysis it was interpreted as infinite acting radial flow and a homogeneous flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-1.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivatives of the CHi and CHir phase show a slight downward trend indicating a slope below 0 and a flow dimension above 2. For the analysis of both phases a homogeneous flow model with a flow dimension of n = 2.1 was chosen. The analysis is presented in Appendix 2-1.

Selected representative parameters

The recommended transmissivity of $1.6 \cdot 10^{-5}$ m^2/s was derived from the radial flow analysis of the CHi phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-6}$ to $3.0 \cdot 10^{-5}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,838.6 kPa.

The radial flow analyses of the CHi and CHir phases show good consistency. No further analysis is recommended.

6.1.2 Section 203.00–303.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The fast recovery of the pulse test indicated a high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 199 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 9.4 L/min at start of the CHi phase to 9.1 L/min at the end, indicating a high interval transmissivity (consistent with the pulse recovery). The data of CHi phase is a little bit noisy, but amenable for a quantitative analysis. The CHir phase recovered relatively fast, but shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the CHi phase is a little bit noisy but shows a relatively flat derivative with a slight downward trend. However, an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a steep downward trend at middle times consistent with a large positive skin and a slight downward trend at late times. In case of this analysis the late time derivative was interpreted as infinite acting radial flow and a homogeneous flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-2.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivatives of the CHi and CHir phase show a slight downward trend indicating a slope below 0 and a flow dimension above 2. For the analysis of both phases a homogeneous flow model with a flow dimension of $n = 2.1$ was chosen. The analysis is presented in Appendix 2-2.

Selected representative parameters

The recommended transmissivity of $3.2 \cdot 10^{-5}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-6}$ to $6.0 \cdot 10^{-5}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,776.6 kPa.

The radial flow analyses of the CHi and CHir phases show relatively good consistency. No further analysis is recommended.

6.1.3 Section 303.00–403.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The fast recovery of the pulse test indicated a relatively high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 195 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 5.4 L/min at start of the CHi phase to 3.4 L/min at the end, indicating a relatively high interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the CHi phase was matched using an infinite acting homogenous radial flow model. The derivative of the CHir phase shows an upward trend at middle times followed by a kind of horizontal stabilization at late times. This behaviour is interpreted as a decrease of transmissivity at some distance from the borehole. A two shell composite radial flow model was chosen for the analysis of the CHir Phase. The analysis is presented in Appendix 2-3.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivatives of the CHi show a slight downward trend. The flow dimension calculated by the slope of the derivative is n = 2.2. For the analysis of the CHi phase a homogeneous flow model was chosen. The flow dimension displayed during the CHir phase is n = 2 and no generalized radial flow analysis was performed. The analysis is presented in Appendix 2-3.

Selected representative parameters

The recommended transmissivity of $6.0 \cdot 10^{-6}$ m^2/s was derived from the radial flow analysis of the CHir phase (outer zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $3.0 \cdot 10^{-6}$ to $9.0 \cdot 10^{-6}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,705.2 kPa.

The radial flow analyses of the CHi and CHir phases show some inconsistency regarding the chosen flow models. However, regarding the derived transmissivities both phases show consistency. No further analysis is recommended.

6.1.4 Section 403.00–503.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a relatively medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 204 kPa. No hydraulic connection to the adjacent zones was observed. The automatic regulation system was not able to maintain stable pressure conditions in the interval during the injection and the pressure oscillates by approximately 10 kPa. However, the CHi phase is still amenable for qualitative analysis. The injection rate decreased from 0.15 L/min at start of the CHi phase to 0.07 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir shows a fast recovery but is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test no trend could be observed for the derivative of the CHi phase. This is attributed to the poor data quality. However, the CHi phase was analysed using an infinite acting homogenous radial flow model. The derivative of the CHir phase shows a steep downward trend at middle times, which is consistent with a large positive skin, and a kind of horizontal stabilization at late times. A homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-4.

Generalized Radial Flow Analysis

In case of the present test both phases do not allow a specific determination of the flow dimension, because of the poor data quality (CHi phase) and no clear flow stabilization (CHir phase). No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $2.7 \cdot 10^{-7}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-8}$ to $6.0 \cdot 10^{-7}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,705.2 kPa.

The radial flow analyses of the CHi and CHir phases show consistency. No further analysis is recommended.

6.1.5 Section 503.00–603.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The fast recovery of the pulse test indicated a high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 215 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 18.0 L/min at start of the CHi phase to 11.5 L/min at the end, indicating a high interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the CHi phase shows a relatively flat derivative with a slight downward trend. However, an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a slight downward trend at middle and late times. In case of this analysis it was interpreted as infinite acting radial flow and a homogeneous flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-5.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivatives of the CHi and CHir phase show a slight downward trend indicating a slope below 0 and a flow dimension above 2. For the analysis of the both phases a homogeneous flow model with a flow dimension of n = 2.1 was chosen. The analysis is presented in Appendix 2-5.

Selected representative parameters

The recommended transmissivity of $2.4 \cdot 10^{-5}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-6}$ to $5.0 \cdot 10^{-5}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,579.0 kPa.

The radial flow analyses of the CHi and CHir phases show good consistency. No further analysis is recommended.

6.1.6 Section 603.00–703.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 205 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. Because of this, the pressure decreased during the injection by 6 kPa. The injection rate decreased from 9 mL/min at start of the CHi phase to 2 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). The recovery phase was measured for 1 h. Both phases show no problems and are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. No flow stabilization was reached during the CHir phase and the data is still influenced by wellbore effects like wellbore storage and skin. However, a homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-6.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivative of the CHi show an upward trend indicating a slope above 0 and a flow dimension below 2. For the analysis of the CHi phases a homogeneous flow model with a flow dimension of n = 1.58 was chosen. Due to the fact that no flow stabilization was reached the CHir phase does not allow a specific determination of the flow dimension. The analysis is presented in Appendix 2-6.

Selected representative parameters

The recommended transmissivity of $2.3 \cdot 10^{-10}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-11}$ to $6.0 \cdot 10^{-10}$ m^2/s (this range includes the transmissivity from the CHi phase). The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 6,513.4 kPa.

The radial flow analyses of the CHi and CHir phases show consistency. No further analysis is recommended.

6.1.7 Section 703.00–803.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 203 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. Because of this, the pressure decreased during the injection by 6 kPa. The injection rate decreased from 10 mL/min at start of the CHi phase to 2 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). The recovery phase was measured for 6 h over night. Both phases show no problems and are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. No clear flow stabilization was reached during the CHir phase and the data is still influenced by wellbore effects like wellbore storage and skin. However, a homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-7.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivative of the CHi show an upward trend. The flow dimension calculated by the slope of the derivative is n = 1.5. For the analysis of the CHi phases a homogeneous flow model was chosen. Due to the fact that no clear flow stabilization was reached the CHir phase does not allow a specific determination of the flow dimension. The analysis is presented in Appendix 2-7.

Selected representative parameters

The recommended transmissivity of $2.0 \cdot 10^{-10}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-11}$ to $4.0 \cdot 10^{-10}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 7,429.3 kPa.

The radial flow analyses of the CHi and CHir phases show good consistency. No further analysis is recommended.

6.1.8 Section 803.00–903.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 235 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. Because of this, the pressure decreased during the injection by 10 kPa. The injection rate decreased from 19 mL/min at start of the CHi phase to 4 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). The recovery phase was measured for 2 h. Both phases show no problems and are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. The CHir phase shows a downward trend at late times, which is typical for a transition from wellbore storage and skin dominated flow to pure formation flow. A homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-8.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivative of the CHi show an upward trend. The flow dimension calculated by the slope of the derivative is $n = 1.7$. For the analysis of the CHi phases a homogeneous flow model was chosen. Due to the fact that no clear flow stabilization was reached the CHir phase does not allow a specific determination of the flow dimension. The analysis is presented in Appendix 2-8.

Selected representative parameters

The recommended transmissivity of $2.9 \cdot 10^{-9}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-10}$ to $4.0 \cdot 10^{-9}$ m^2/s (this range includes the derived transmissivity of the CHi phase). The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 8,333.1 kPa.

The radial flow analyses of the CHi and CHir phases show consistency. No further analysis is recommended.

6.1.9 Section 876.00–976.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

After closing the testvalve the pressure in the test section rose by 12 kPa. This can be explained either by prolonged packer expansion in a relatively tight section or by the fact that the initial formation pressure is higher than the pressure measured on test depth. During the brief injection phase of the pulse injection a total volume of about 54 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 211 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $2.6 \cdot 10^{-10}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure derivative shows an upward trend at early and middle times followed by a downward trend at late times. This downward trend at late times can be attributed to the uncertainty of the initial formation pressure. Due to this uncertainty only the early and middle time data was matched using an infinite acting radial flow model. The analysis is presented in Appendix 2-9.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. The flow dimension calculated by the slope of the pressure derivative at early and middle times is n = 1.33. The PI phase was analysed using a homogeneous flow model. The analysis is presented in Appendix 2-9.

Selected representative parameters

The recommended transmissivity of $4.0 \cdot 10^{-11}$ m^2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-11}$ to $8.0 \cdot 10^{-11}$ m^2/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.2 20 m hydraulic injection tests

In the following, the 20 m section tests conducted in borehole KLX11A are presented and analysed.

6.2.1 Section 103.00–123.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a relatively high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 1.5 L/min at start of the CHi phase to 1.4 L/min at the end, indicating a relatively high interval transmissivity (consistent with the pulse recovery). The recorded data of the CHi phase is a little bit noisy, but still amenable for qualitative analyses. The CHir phase shows a relatively fast recovery, but shows no further problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present the CHi phase (although noisy) shows a flat derivative. The relatively fast recovery of the CHir phase adds a little bit uncertainty to the late time derivative of this phase. However, an indication of horizontal stabilization can be observed at late times. Both phases were analysed using a radial infinite acting homogenous flow model. The analysis is presented in Appendix 2-10.

Generalized Radial Flow Analysis

In case of the present test both phases do not allow a specific determination of the flow dimension, because no clear flow stabilization could be observed. No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $4.9 \cdot 10^{-6}$ m^2/s was derived from the radial flow analysis of the CHir phase, which was considered to be more reliable. The confidence range for the interval transmissivity is estimated to be $3.0 \cdot 10^{-6}$ to $8.0 \cdot 10^{-6}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,092.9 kPa.

The radial flow analyses of the CHi and CHir phases show consistency. No further analysis is recommended.

6.2.2 Section 123.00–143.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The fast recovery of the pulse test indicated a high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 4.3 L/min at start of the CHi phase to 3.9 L/min at the end, indicating a high interval transmissivity (consistent with the pulse recovery). The both phases show no problems and are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the derivatives of both phases show a downward trend at late times, which was interpreted as an increase of transmissivity at some distance from the borehole. Both phases were analysed using a two shell composite radial flow model. The analysis is presented in Appendix 2-11.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. The changes of slope in the derivatives of both phases are interpreted as a change in flow dimension away from the borehole. The CHi phase was analysed using a two shell composite flow model with n1 = 2.3 and n2 = 2.38 and the CHir phase with a two shell composite flow model with n1 = 2.3 and n2 = 2.40. The analysis is presented in Appendix 2-11.

Selected representative parameters

The recommended transmissivity of $8.1 \cdot 10^{-6}$ m^2/s was derived from the radial flow analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-6}$ to $1.0 \cdot 10^{-5}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,275.5 kPa.

The radial flow analyses of the CHi and CHir phases show good consistency. No further analysis is recommended.

6.2.3 Section 143.00–163.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 207 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 1.1 L/min at start of the CHi phase to 0.4 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHi phase shows some problems at the beginning of the injection caused by the automatic regulation unit, but the middle and late time data is still amenable for quantitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the middle time data of the CHi phase, which shows a kind of horizontal stabilization of the derivative, was matched using a homogeneous radial flow model. The derivative of the CHir phase shows an upward trend at middle times followed by a stabilization at late times, indicating a decrease of transmissivity at some distance from the borehole. A two shell composite radial flow model was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-12.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. The flow dimension calculated by the slope of the CHi derivative at middle and late times is n = 2.3. A homogeneous flow model was used to match the CHi phase. No generalized radial flow analysis was performed for the CHir phase. The analysis is presented in Appendix 2-12.

Selected representative parameters

The recommended transmissivity of $1.4·10^{-7}$ m^2/s was derived from the radial flow analysis of the CHir phase (outer zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0·10^{-8}$ to $4.0·10^{-7}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,443.8 kPa.

The radial flow analyses of the CHi and CHir phases show inconsistency regarding the chosen flow models, but a comparison of the derived transmissivities (CHi and outer zone CHir) in combination with the negative skin of the CHi phase show consistency between both phases. No further analysis is recommended.

6.2.4 Section 163.00–183.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a relatively high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 201 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 3.0 L/min at start of the CHi phase to 2.5 L/min at the end, indicating a relatively high interval transmissivity (consistent with the pulse recovery). The CHir phase shows a fast recovery, which adds uncertainty to the derivative analysis. Both phases show no problems and are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the derivatives of both phases show a clear horizontal stabilization at middle and late times. The fast recovery of the CHir phase adds ambiguity to the middle and late time derivative of this phase. A homogeneous radial flow model was used for the analysis of both phases. The analysis is presented in Appendix 2-13.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test both phases show a clear horizontal stabilization which is indicative for a flow dimension of 2 (radial flow). For this reason no generalized radial flow analysis was necessary.

Selected representative parameters

The recommended transmissivity of $6.5·10^{-6}$ m^2/s was derived from the radial flow analysis of the CHir phase, because it shows the most clear derivative stabilization. The confidence range for the interval transmissivity is estimated to be $4.0·10^{-6}$ to $1.0·10^{-5}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,650.5 kPa.

The radial flow analyses of the CHi and CHir phases show good consistency. No further analysis is recommended.

6.2.5 Section 183.00–203.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 60 kPa in 30 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-14.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.2.6 Section 203.00–223.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 106 kPa in 25 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-15.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.2.7 Section 223.00–243.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

After closing the testvalve the pressure in the test section rose by 14 kPa. This can be explained either by prolonged packer expansion in a relatively tight section or by the fact that the initial formation pressure is higher than the pressure measured on test depth. During the brief injection phase of the pulse injection a total volume of about 13 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 225 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $5.8 \cdot 10^{-11}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure derivative shows a downward trend at late times. This downward trend at late times can be attributed to the uncertainty of the initial formation pressure. Due to this uncertainty only the early and middle time data was matched using an infinite acting radial flow model. The analysis is presented in Appendix 2-16.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. The flow dimension calculated by the slope of the pressure derivative at early and middle times is n = 1.79. The PI phase was analysed using a homogeneous flow model. The analysis is presented in Appendix 2-16.

Selected representative parameters

The recommended transmissivity of $3.3 \cdot 10^{-10}$ m^2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-10}$ to $6.0 \cdot 10^{-10}$ m^2/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.2.8 Section 243.00–263.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 213 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 0.5 L/min at start of the CHi phase to 0.04 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The recorded data of the injection phase is noisy, but amenable for quantitative analysis. The CHir phase shows a fast recovery, which adds uncertainty to the derivative analysis. The phase shows no further problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the CHi phase is noisy but it shows a relatively flat derivative at middle times. The Chi phase was matched using a homogeneous radial flow model. The derivative of the CHir phase shows a downward trend at late times followed by a kind of flow stabilization at late times. A composite radial flow model with wellbore storage and skin was used to analyse the CHir phase. The analysis is presented in Appendix 2-17.

Generalized Radial Flow Analysis

In case of the present test both phases do not allow a specific determination of the flow dimension, because of the noisy data (CHi phase) and no clear flow stabilisation (CHir phase). No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $3.7 \cdot 10^{-8}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-9}$ to $8.0 \cdot 10^{-8}$ m^2/s (this range encompasses the transmissivity of the CHi phase). The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,401.2 kPa.

The radial flow analyses of the CHi and CHir phases little inconsistency in the derived transmissivities, which is attributed to the noise in the CHi phase and the fast recovery of the CHir phase. No further analysis is recommended.

6.2.9 Section 263.00–283.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The fast recovery of the pulse test indicated a high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 201 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 10.8 L/min at start of the CHi phase to 9.9 L/min at the end, indicating a high interval transmissivity (consistent with the pulse recovery). The data of CHi phase is a little bit noisy, but amenable for a quantitative analysis. The CHir phase recovered relatively fast, but shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the CHi phase is a little bit noisy but shows a relatively flat derivative at late times. However, an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a steep downward trend at middle times consistent with a large positive skin and a kind of horizontal stabilization at late times. In case of this analysis the late time derivative was interpreted as infinite acting radial flow and a homogeneous flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-18.

Generalized Radial Flow Analysis

In case of the present test both phases do not allow a specific determination of the flow dimension, because of the noisy data (CHi phase) and no clear flow stabilisation (CHir phase). No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $3.6 \cdot 10^{-5}$ m²/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-6}$ to $6.0 \cdot 10^{-5}$ m²/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,589.2 kPa.

The radial flow analyses of the CHi and CHir phases show relatively good consistency. No further analysis is recommended.

6.2.10 Section 283.00–303.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

After closing the testvalve the pressure in the test section rose by 15 kPa. This can be explained either by prolonged packer expansion in a relatively tight section or by the fact that the initial formation pressure is higher than the pressure measured on test depth. During the brief injection phase of the pulse injection a total volume of about 13 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 237 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $5.6 \cdot 10^{-11}$ m³/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure derivative shows an upward trend at early and middle times followed by a kind of downward trend at late times, which can be attributed to the uncertainty of the initial formation pressure. In case of the present analysis the continuing upward trend at the beginning of the derivative can be interpreted to the fact that the dimensionless test time is to small and semi-logarithmic asymptotic solution was not achieved (due to the very small transmissivity). The PI phase was analysed using a radial homogeneous flow model. The analysis is presented in Appendix 2-19.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of this analysis the upward trend at early and middle times of the derivative indicates a slope above 0 and a flow dimension below 2. For the generalized radial flow analysis a homogeneous flow model with $n = 1.49$ was used. The analysis is presented in Appendix 2-19.

Selected representative parameters

The recommended transmissivity of $2.2 \cdot 10^{-11}$ m²/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-12}$ to $6.0 \cdot 10^{-11}$ m²/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.2.11 Section 303.00–323.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The fast recovery of the pulse test indicated a relatively high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 224 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 4.5 L/min at start of the CHi phase to 3.9 L/min at the end, indicating a relatively high interval transmissivity (consistent with the pulse recovery).The injection phase is a little bit noisy but still amenable for qualitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the CHi phase was matched using an infinite acting homogenous radial flow model. The derivative of the CHir phase shows an upward trend at middle times followed by a horizontal stabilization at late times. This behaviour is interpreted as a decrease of transmissivity at some distance from the borehole. A two shell composite radial flow model was chosen for the analysis of the CHir Phase. The analysis is presented in Appendix 2-20.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivatives of the CHi show a slight downward trend. The flow dimension calculated by the slope of the derivative is n = 2.2. For the analysis of the CHi phases a homogeneous flow model was chosen. The flow dimension displayed during the CHir phase is n = 2 and no generalized radial flow analysis was performed. The analysis is presented in Appendix 2-20.

Selected representative parameters

The recommended transmissivity of $5.8 \cdot 10^{-6}$ m^2/s was derived from the radial flow analysis of the CHir phase (outer zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $3.0 \cdot 10^{-6}$ to $9.0 \cdot 10^{-6}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,958.2 kPa.

The radial flow analyses of the CHi and CHir phases show some inconsistency regarding the chosen flow models. However, regarding the derived transmissivities both phases show consistency. No further analysis is recommended.

6.2.12 Section 323.00–343.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 218 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. However, no pressure loss occurred during the injection phase. The injection rate was with 4 mL/min at start of the CHi phase and dropped below measurement limit (1 mL/min) after 11 min, indicating a very low interval transmissivity (consistent with the pulse recovery). Due to the very low flow rate the recorded data of the flow rate is very noisy and the results of the CHi phase should be regarded carefully. The CHir phase was measured for 4 h and shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. The CHir phase shows a downward trend at late times, which is typical for a transition from wellbore storage and skin dominated flow to pure formation flow. A homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-21.

Generalized Radial Flow Analysis

In case of the present test both phases do not allow a specific determination of the flow dimension, because of the very poor data quality (CHi phase) and no flow stabilization (CHir phase). No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $5.5 \cdot 10^{-11}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $2.0 \cdot 10^{-11}$ to $9.0 \cdot 10^{-11}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,137.1 kPa.

No further analysis is recommended.

6.2.13 Section 343.00–363.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 195 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. Because of this, the pressure decreased during the injection by 7 kPa. The injection rate decreased from 87 mL/min at start of the CHi phase to 9 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery).The injection phase is a little bit noisy but still amenable for quantitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the derivative of the CHi phase shows an upward trend at middle times followed by a kind of horizontal stabilization at late times. This behaviour is interpreted as a decrease of transmissivity at some distance from the borehole. The derivative of the CHir phase shows an upward trend at middle times as well but no stabilization at late time, indicating no formation flow stabilization was reached. Both phases are matched using a two shell composite radial flow model. The analysis is presented in Appendix 2-22.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present analysis the upward trend at middle times is interpreted as a change of flow dimension. The calculation based on the slope of the derivatives indicates a flow dimension of n2 = 1.6 for the CHi phase as well as for the CHir phase. A two shell composite flow model was used for the analysis of both phases. The analysis is presented in Appendix 2-22.

Selected representative parameters

The recommended transmissivity of $4.3 \cdot 10^{-9}$ m^2/s was derived from the radial flow analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-9}$ to $8.0 \cdot 10^{-9}$ m^2/s. Due to the low transmissivity no fresh water head was calculated.

The radial flow analyses of the CHi and CHir phases show good consistency. No further analysis is recommended.

6.2.14 Section 363.00–383.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

After closing the testvalve the pressure in the test section rose by 4 kPa. This can be explained either by prolonged packer expansion in a relatively tight section or by the fact that the initial formation pressure is higher than the pressure measured on test depth. During the brief injection phase of the pulse injection a total volume of about 8 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 217 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $3.6 \cdot 10^{-11}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. The deconvolved PI pressure derivative shows a slight upward trend at middle and late. However, in case of the present analysis the PI phase was matched using a radial homogeneous flow model. The analysis is presented in Appendix 2-23.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of this analysis the slight upward trend at middle and late times of the derivative indicates a slope above 0 and a flow dimension below 2. For the generalized radial flow analysis a homogeneous flow model with n = 1.75 was used. The analysis is presented in Appendix 2-23.

Selected representative parameters

The recommended transmissivity of $1.1·10^{–11}$ m^2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $9.0·10^{–12}$ to $5.0·10^{–11}$ m^2/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.2.15 Section 383.00–403.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 244 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. However, no pressure loss occurred during the injection phase. The injection rate decreased from 12 mL/min at start of the CHi phase to 5 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the very low flow rate the recorded data of the flow rate is very noisy and the results of the CHi phase should be regarded carefully. The CHir shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. Due to the poor data quality the CHi phase is not very conclusive. However, in case of the present test an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. The CHir phase shows a downward trend at late times, which is typical for a transition from wellbore storage and skin dominated flow to pure formation flow. A homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-24.

Generalized Radial Flow Analysis

In case of the present test both phases do not allow a specific determination of the flow dimension, because of the very poor data quality (CHi phase) and no flow stabilization (CHir phase). No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $3.3·10^{–09}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $9.0·10^{–10}$ to $5.0·10^{–09}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,699.9 kPa.

The radial flow analyses of the CHi and CHir phases show consistency. No further analysis is recommended.

6.2.16 Section 403.00–423.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

During the brief injection phase of the pulse injection a total volume of about 16 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 233 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $6.8 \cdot 10^{-11}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure derivative is noisy at early and middle times, which adds uncertainty to the derivative analysis. However, the PI phase was analysed using a radial homogeneous flow model. The analysis is presented in Appendix 2-52.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of this analysis the flow dimension calculated by the slope of the derivative at early and middle times is $n = 1.45$.A homogeneous flow model was chosen for the analysis of the PI phase. The analysis is presented in Appendix 2-52.

Selected representative parameters

The recommended transmissivity of $2.9 \cdot 10^{-11}$ m^2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-12}$ to $8.0 \cdot 10^{-11}$ m^2/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.2.17 Section 423.00–443.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a relatively medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 202 kPa. No hydraulic connection to the adjacent zones was observed. The automatic regulation system was not able to maintain stable pressure conditions in the interval during the injection and the pressure oscillates by approximately 5 kPa. However, the CHi phase is still analysable, but the results should be regarded carefully. The injection rate decreased from 80 mL/min at start of the CHi phase to 60 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir shows a fast recovery but is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test no trend could be observed for the derivative of the CHi phase. This is attributed to the poor data quality. However, the CHi phase was analysed using an infinite acting homogenous radial flow model. The derivative of the CHir phase shows a steep downward trend at middle times, which is consistent with a large positive skin, and a kind of horizontal stabilization at late times. A homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-26.

Generalized Radial Flow Analysis

In case of the present test both phases do not allow a specific determination of the flow dimension, because of the poor data quality (CHi phase) and no clear flow stabilization (CHir phase). No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $2.0 \cdot 10^{-7}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-8}$ to $6.0 \cdot 10^{-7}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,086.5 kPa.

The radial flow analyses of the CHi and CHir phases show little inconsistency in the derived transmissivity, which can be attributed to the poor data quality of the CHi phase. No further analysis is recommended.

6.2.18 Section 443.00–463.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a relatively low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 244 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. Because of this, the pressure decreased during the injection by 9 kPa. The injection rate decreased from 36 mL/min at start of the CHi phase to 30 mL/min at the end, indicating a relatively low interval transmissivity (consistent with the pulse recovery). The CHir phase shows a relatively fast recovery, which adds uncertainty to the derivative analyses. However, both phases are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the CHi phase shows a flat derivative which can be interpreted as radial flow. A radial homogeneous flow model was used to analyse the CHi phase. The derivative of the CHir phase shows a unit slope downward trend at middle times, indicating a large positive skin. There is an indication of stabilization in the late time derivative. The CHir phase is matched using a radial homogeneous flow model. The analysis is presented in Appendix 2-27.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivative of the CHi phase shows a horizontal stabilization with a slope of 0, indicating a flow dimension n = 2. For this reason no generalized radial flow analysis was performed. Due to the fast recovery and no clear flow stabilization of the CHir phase, no generalized radial flow analysis was performed, either. The analysis is presented in Appendix 2-27.

Selected representative parameters

The recommended transmissivity of $3.1 \cdot 10^{-8}$ m^2/s was derived from the radial flow analysis of the CHi phase, which shows a better derivative stabilization. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-9}$ to $6.0 \cdot 10^{-8}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,269.7 kPa.

The radial flow analyses of the CHi and CHir phases show inconsistency in the derived transmissivities, which is attributed to the fast recovery of the CHir phase. The fast recovery may be caused by non-Darcy flow effects in the formation. No further analysis is recommended.

6.2.19 Section 463.00–483.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

After closing the testvalve the pressure in the test section rose by approx. 20 kPa. This can be explained either by prolonged packer expansion in a relatively tight section or by the fact that the initial formation pressure is higher than the pressure measured on test depth. During the brief injection phase of the pulse injection a total volume of about 13 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 213 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $6.3 \cdot 10^{-11}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure derivative shows an upward trend at early and middle times followed by a downward trend at late times, which can be attributed to the uncertainty of the initial formation pressure. However, in case of the present analysis the early and middle time derivative of the PI phase was matched using a homogeneous radial flow model. The analysis is presented in Appendix 2-28.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of this analysis the upward trend at early and middle times of the derivative indicates a slope above 0 and a flow dimension below 2. For the generalized radial flow analysis a homogeneous flow model with n = 1.7 was used. The analysis is presented in Appendix 2-28.

Selected representative parameters

The recommended transmissivity of $5.7 \cdot 10^{-11}$ m^2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $2.0 \cdot 10^{-11}$ to $9.0 \cdot 10^{-11}$ m^2/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.2.20 Section 483.00–503.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 250 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. However, no pressure loss occurred during the injection phase. The injection rate decreased from 20 mL/min at start of the CHi phase to 7 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the low flow rate the recorded data of the flow rate is noisy and the results of the CHi phase should be regarded carefully. The CHir shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. Due to the poor data quality the CHi phase is not very conclusive. However, in case of the present test an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. The CHir phase shows a downward trend at late times, which is typical for a transition from wellbore storage and skin dominated flow to pure formation flow. A composite radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-29.

Generalized Radial Flow Analysis

In case of the present test both phases do not allow a specific determination of the flow dimension, because of the poor data quality (CHi phase) and no flow stabilization (CHir phase). No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $2.5 \cdot 10^{-9}$ m^2/s was derived from the radial flow analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-10}$ to $5.0 \cdot 10^{-09}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,645.5 kPa.

The radial flow analyses of the CHi and CHir phases show inconsistency regarding the chosen flow model. This inconsistency can be attributed to the poor data quality of the CHi phase. However, regarding the derived transmissivities, both phases show consistency. No further analysis is recommended.

6.2.21 Section 503.00–523.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a relatively high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 4.2 L/min at start of the CHi phase to 3.5 L/min at the end, indicating a relatively high interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the CHi and CHir phases show a flat derivative at middle and late times, indicating formation flow stabilization and radial flow. Both phases are analysed using a radial homogeneous flow model. The analysis is presented in Appendix 2-30.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivative of both phases show a horizontal stabilization with a slope of 0, indicating a flow dimension n = 2. Therefore no generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $4.1 \cdot 10^{-6}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-6}$ to $7.0 \cdot 10^{-6}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,830.4 kPa.

The radial flow analyses of the CHi and CHir phases show good consistency. No further analysis is recommended.

6.2.22 Section 523.00–543.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 204 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from approx. 110 mL/min at start of the CHi phase to 80 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The start of the CHi phase is noisy and the automatic regulation system needs a while to reach stable pressure conditions. However, the CHi phase is still amenable for qualitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the CHi phase was matched using a homogeneous radial flow model. The derivative of the CHir phase shows a deep downward trend at middle times, which is consistent with a large positive skin. There is an indication of formation flow stabilization at the end. The CHir phase was analysed using a radial homogeneous flow model. The analysis is presented in Appendix 2-31.

Generalized Radial Flow Analysis

In case of the present test both phases do not allow a specific determination of the flow dimension, because of the poor data quality (CHi phase) and no clear flow stabilization (CHir phase). No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $2.2 \cdot 10^{-7}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-8}$ to $6.0 \cdot 10^{-7}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,023.2 kPa.

Apart from the high skin derived from the CHir phase, the radial flow analyses of the CHi and CHir phases show good consistency. No further analysis is recommended.

6.2.23 Section 543.00–563.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

After closing the testvalve the pressure in the test section rose by approx. 7 kPa. This can be explained either by prolonged packer expansion in a relatively tight section or by the fact that the initial formation pressure is higher than the pressure measured on test depth. During the brief injection phase of the pulse injection a total volume of about 2 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 220 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.1 \cdot 10^{-11}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. The deconvolved PI pressure derivative shows an upward trend at middle times followed by a kind of horizontal stabilization at late times. In this analysis this behaviour is interpreted as decrease of transmissivity at some distance from the borehole. A two shell composite radial flow model was used for the analysis of the PI phase. The analysis is presented in Appendix 2-32.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of this analysis the upward trend at middle times of the derivative indicates a slope above 0 and a flow dimension below 2. For the generalized radial flow analysis a homogeneous flow model with n = 1 (linear flow) was used. The analysis is presented in Appendix 2-32.

Selected representative parameters

The recommended transmissivity of $1.2 \cdot 10^{-12}$ m^2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-13}$ to $4.0 \cdot 10^{-12}$ m^2/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.2.24 Section 563.00–583.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The fast recovery of the pulse test indicated a high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 198 kPa. The pressure in the bottom zone rose by approx. 10 kPa indicating a connection to the test interval. The injection rate decreased from 13.8 L/min at start of the CHi phase to 8.8 L/min at the end, indicating a high interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the CHi phase shows a relatively flat derivative with a slight downward trend. However, an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a slight downward trend at late times. In case of this analysis it was interpreted as infinite acting radial flow and a homogeneous flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-33.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivatives of the CHi and CHir phase show a slight downward trend indicating a slope below 0 and a flow dimension above 2. For the analysis of the both phases a homogeneous flow model with a flow dimension of n = 2.1 was chosen. The analysis is presented in Appendix 2-33.

Selected representative parameters

The recommended transmissivity of $2.7 \cdot 10^{-5}$ m^2/s was derived from the radial flow analysis of the CHi phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-6}$ to $5.0 \cdot 10^{-5}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,392.3 kPa.

The radial flow analyses of the CHi and CHir phases show good consistency. No further analysis is recommended.

6.2.25 Section 583.00–603.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 201 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 0.5 L/min at start of the CHi phase to 0.3 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the derivative of the CHi phase shows a horizontal stabilization at middle times followed by an upward trend at late times. The CHir response is consistent with the CHi phase. Both phases are matched using a two shell composite radial flow model with decreasing transmissivitiy at some distance from the borehole. The analysis is presented in Appendix 2-34.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test both phases show a horizontal stabilization at middle times which is typical for radial flow ($n = 2$). The following upward trend was interpreted as a change of flow dimension away from the borehole. The calculation of the outer zone flow dimension based on the slope of the derivative is $n2 = 1.9$ (CHi) and 1.95 (CHir), respectively. Both phases are matched using a two shell composite flow model with a change of flow dimension at some distance from the borehole. The analysis is presented in Appendix 2-34.

Selected representative parameters

The recommended transmissivity of $7.9 \cdot 10^{-7}$ m^2/s was derived from the radial flow analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-7}$ to $1 \cdot 10^{-6}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,581.5 kPa.

The radial flow analyses of the CHi and CHir phases show good consistency. No further analysis is recommended.

6.2.26 Section 603.00–623.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

During the brief injection phase of the pulse injection a total volume of about 13 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 243 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $5.5\cdot10^{-11}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present analysis the derivative of the PI phase was matched using a homogeneous radial flow model. The analysis is presented in Appendix 2-35.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of this analysis the upward trend of the derivative indicates a slope above 0 and a flow dimension below 2. For the generalized radial flow analysis a homogeneous flow model with n = 1.5 was used. The analysis is presented in Appendix 2-35.

Selected representative parameters

The recommended transmissivity of $4.4\cdot10^{-11}$ m^2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $1.0\cdot10^{-11}$ to $9.0\cdot10^{-11}$ m^2/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.2.27 Section 623.00–643.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

During the brief injection phase of the pulse injection a total volume of about 13 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 220 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $6.0\cdot10^{-11}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the derivative of the PI phase shows an upward trend at middle and late times, interpreted as a decrease of transmissivity at some distance from the borehole. Because the outer zone stabilization was not observed, the derived outer zone transmissivity should be regarded as an upper limit only. The PI phase was matched using a radial composite flow model. The analysis is presented in Appendix 2-36.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test no reliable flow dimension can be calculated by the slope of derivative. No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $1.3 \cdot 10^{-11}$ m^2/s was derived from the radial flow analysis of the PI phase (inner zone). The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-12}$ to $4.0 \cdot 10^{-11}$ m^2/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.2.28 Section 643.00–663.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

After closing the testvalve the pressure in the test section rose by 6 kPa. This can be explained either by prolonged packer expansion in a relatively tight section or by the fact that the initial formation pressure is higher than the pressure measured on test depth. During the brief injection phase of the pulse injection a total volume of about 7 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 218 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $3.1 \cdot 10^{-11}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure derivative shows a continuing upward trend, which can be attributed to fact that the dimensionless test time is to small and the semi-logarithmic asymptotic solution was not achieved (due to the small transmissivity). The PI phase was analysed using a radial homogeneous flow model. The analysis is presented in Appendix 2-37.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of this analysis the continuing upward trend indicates a flow dimension of $n = 1.6$ (interpreted form the slope of derivative). For the generalized radial flow analysis a homogeneous flow model was used. The analysis is presented in Appendix 2-37.

Selected representative parameters

The recommended transmissivity of $2.1 \cdot 10^{-12}$ m^2/s was derived from the radial flow analysis of the PI phase. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-13}$ to $6.0 \cdot 10^{-12}$ m^2/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.2.29 Section 663.00–683.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The relatively slow recovery of the pulse test indicated a low formation transmissivity. The pulse recovery was measured over night. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. All phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 256 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. However, no large pressure loss occurred during the injection phase. The injection rate decreased from 5 mL/min at start of the CHi phase to 1 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the low flow rate the recorded data of the flow rate is noisy but is still amenable for qualitative analysis. The CHir shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the derivative of the CHi phase (although noisy) shows a upward trend at middle times and a kind of stabilization at late times, indicating a transition to a zone of lower transmissivity. A radial flow composite model was used for the analysis of the CHi phase. No clear flow stabilization was reached during the CHir phase and the data is still influenced by wellbore effects like wellbore storage and skin. However, a homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-38.

Generalized Radial Flow Analysis

In case of the present test both phases do not allow a specific determination of the flow dimension, because of the no clear flow stabilization. No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $2.0 \cdot 10^{-10}$ m^2/s was derived from the radial flow analysis of the CHi phase (outer zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-11}$ to $7.0 \cdot 10^{-10}$ m^2/s (this range includes the transmissivity derived from the inner zone transmissivity the CHi phase). The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 6,317.5 kPa.

The radial flow analyses of the CHi and CHir phases show inconsistency regarding the chosen flow model. This inconsistency can be attributed to the fact that no flow stabilization was reached during the CHir phase caused by the low transmissivity. No further analysis is recommended.

The conducted over night pulse was analysed using a radial composite flow model with decreasing transmissivity away from the borehole. Due to the uncertainty of the initial formation pressure the results should be regarded carefully. The derived inner zone transmissivity is $1.3 \cdot 10^{-10}$ m^2/s. The analysis is presented in Appendix 2-38.

6.2.30 Section 683.00–703.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

During the brief injection phase of the pulse injection a total volume of about 12 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 224 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $5.3 \cdot 10^{-11}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the derivative of the PI shows an upward trend at middle and late times. This behaviour is interpreted as an decrease of transmissivity at some distance form the borehole. A two shell composite radial flow model was chosen for the analysis of the PI phase. The analysis is presented in Appendix 2-39.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of this analysis the upward trend of the derivative at middle and late times is interpreted as a change of flow dimension. The flow dimension displayed at the middle and late time is $n = 1.87$. A composite flow model with a decrease in flow dimension at some distance from the borehole was chosen for the analysis. The analysis is presented in Appendix 2-39.

Selected representative parameters

The recommended transmissivity of $1.5 \cdot 10^{-10}$ m^2/s was derived from the radial flow analysis of the Pi phase (outer zone). The confidence range for the interval transmissivity is estimated to be $6.0 \cdot 10^{-11}$ to $3.0 \cdot 10^{-10}$ m^2/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.2.31 Section 703.00–723.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The relatively slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 210 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. However, no large pressure loss occurred during the injection phase. The injection rate decreased from 30 mL/min at start of the CHi phase to 3 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the low flow rate the recorded data of the flow rate is noisy but is still amenable for qualitative analysis. The CHir shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the derivative of the CHi phase is noisy. However, the CHi phase was matched using a radial flow composite model. No clear flow stabilization was reached during the CHir phase and the data is still influenced by wellbore effects like wellbore storage and skin. A homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-40.

Generalized Radial Flow Analysis

In case of the present test both phases do not allow a specific determination of the flow dimension, because of the noisy data (CHi phase) and no clear flow stabilization (CHir phase). No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $2.6 \cdot 10^{-10}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-11}$ to $6.0 \cdot 10^{-10}$ m^2/s. Due to the low transmissivity no fresh water head was calculated.

The radial flow analyses of the CHi and CHir phases show consistency. No further analysis is recommended.

6.2.32 Section 723.00–743.00 m, test no. 1, pulse injection

Comments to test

The intention was to design the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and opening/closing the test valve for conducting the preliminary pulse injection, no pulse recovery was observed and the pressure stayed stable for approx. 40 minutes. This phenomenon is caused by a combination of prolonged packer expansion and a very tight section (T probably smaller than 1E–11 m^2/s). None of the test phases is analysable.

No analysis was performed. The measured data is presented in Appendix 2-41.

Selected representative parameters

Based on the test response the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.2.33 Section 743.00–763.00 m, test no. 1, pulse injection

Comments to test

The intention was to design the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and opening/closing the test valve for conducting the preliminary pulse injection, no pulse recovery was observed. This phenomenon is caused by a combination of prolonged packer expansion and a very tight section (T probably smaller than 1E–11 m^2/s). None of the test phases is analysable.

No analysis was performed. The measured data is presented in Appendix 2-42.

Selected representative parameters

Based on the test response the interval transmissivity is lower than $1.0\cdot10^{-11}$ m^2/s.

No further analysis recommended.

6.2.34 Section 763.00–783.00 m, test no. 1, pulse injection

Comments to test

The intention was to design the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and opening/closing the test valve for conducting the preliminary pulse injection, no pulse recovery was observed and the pressure stayed stable for approx. 10 minutes. This phenomenon is caused by a combination of prolonged packer expansion and a very tight section (T probably smaller than 1E–11 m^2/s). None of the test phases is analysable.

No analysis was performed. The measured data is presented in Appendix 2-43.

Selected representative parameters

Based on the test response the interval transmissivity is lower than $1.0\cdot10^{-11}$ m^2/s.

No further analysis recommended.

6.2.35 Section 783.00–803.00 m, test no. 1, pulse injection

Comments to test

The intention was to design the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and opening/closing the test valve for conducting the preliminary pulse injection, no pulse recovery was observed and the pressure increases. This phenomenon is caused by a combination of prolonged packer expansion and a very tight section (T probably smaller than 1E–11 m^2/s). None of the test phases is analysable.

No analysis was performed. The measured data is presented in Appendix 2-44.

Selected representative parameters

Based on the test response the interval transmissivity is lower than $1.0\cdot10^{-11}$ m^2/s.

No further analysis recommended.

6.2.36 Section 803.00–823.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 36 kPa in 25 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-45.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.2.37 Section 823.00–843.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 47 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-46.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.2.38 Section 843.00–863.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 240 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. Because of this, the pressure decreased during the injection by 4 kPa. The injection rate decreased from 14 mL/min at start of the CHi phase to 4 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the low flow rate the recorded data of the flow rate is noisy but is still amenable for qualitative analysis. The CHir shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the derivative of the CHi phase is noisy. However, the CHi phase was matched using a radial flow composite model. The late time derivative of the CHir phase shows an indication of horizontal stabilization, which can be attributed to radial flow. A homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-46.

Generalized Radial Flow Analysis

In case of the present test CHi phases do not allow a specific determination of the flow dimension, because of the noisy data (CHi phase) and the insufficient flow stabilization (CHir phase). No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $8.2 \cdot 10^{-10}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-10}$ to $1.0 \cdot 10^{-09}$ m^2/s. Due to the low transmissivity no fresh water head was calculated.

The radial flow analyses of the CHi and CHir phases show consistency. No further analysis is recommended.

6.2.39 Section 863.00–883.00 m, test no. 1, injection

Comments to test

The intention was to design the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and opening/closing the test valve for conducting the preliminary pulse injection, no pulse recovery was observed and the pressure stayed stable for approx. 15 minutes. This phenomenon is caused by a combination of prolonged packer expansion and a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m^2/s). None of the test phases is analysable.

No analysis was performed. The measured data is presented in Appendix 2-48.

Selected representative parameters

Based on the test response the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3 5 m hydraulic injection tests

In the following, the 5 m section tests conducted in borehole KLX11A are presented and analysed.

6.3.1 Section 303.00–308.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a relatively high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 201 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 1.2 L/min at start of the CHi phase to 0.6 L/min at the end, indicating a relatively high interval transmissivity (consistent with the pulse recovery). The CHi phase shows no problems and is adequate for quantitative analysis. The CHir phase shows a fast recovery, which adds uncertainty to the derivative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present the derivative of the CHi phase shows a slight upward trend. The CHir derivative is very poor due to the very fast recovery. However, a radial homogeneous flow model was used for the analysis of both phases. The analysis is presented in Appendix 2-49.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivative of the CHi phase indicates a flow dimension of 1.9. For the analysis of the CHi phases a homogeneous flow model was chosen. Due to the poor data quality of the CHir phase no generalized radial flow analysis was performed. The analysis is presented in Appendix 2-49.

Selected representative parameters

The recommended transmissivity of $6.0 \cdot 10^{-7}$ m^2/s was derived from the radial flow analysis of the CHi phase, which is showing the best data quality. The confidence range for the interval transmissivity is estimated to be $2.0 \cdot 10^{-7}$ to $9.0 \cdot 10^{-7}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,822.7 kPa.

The quality of the CHir phase is very poor and leads to inconsistency between the CHi and CHir phase. The fast recovery may be caused by non-Darcy flow effects in the formation. No further analysis recommended.

6.3.2 Section 308.00–313.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The fast recovery of the pulse test indicated a relatively high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 3.2 L/min at start of the CHi phase to 3.9 L/min at the end, indicating a relatively high interval transmissivity (consistent with the pulse recovery). The automatic rate control functioned well, the recorded flow rate is however a little bit noisy. The CHir phase shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the CHi phase was matched using an infinite acting homogenous radial flow model. The derivative of the CHir phase shows an upward trend at middle times followed by a horizontal stabilization at late times. This behaviour is interpreted as a decrease of transmissivity at some distance from the borehole. A two shell composite radial flow model was chosen for the analysis of the CHir Phase. The analysis is presented in Appendix 2-50.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivatives of the CHi show a slight downward trend. The flow dimension calculated by the slope of the derivative is n = 2.2. For the analysis of the CHi phases a homogeneous flow model was chosen. The flow dimension displayed during the CHir phase is n = 2 and no generalized radial flow analysis was performed. The analysis is presented in Appendix 2-50.

Selected representative parameters

The recommended transmissivity of $6.5 \cdot 10^{-6}$ m^2/s was derived from the radial flow analysis of the CHir phase (outer zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $2.0 \cdot 10^{-6}$ to $9.0 \cdot 10^{-6}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,867.5 kPa.

The radial flow analyses of the CHi and CHir phases show some inconsistency regarding the chosen flow models. However, regarding the derived transmissivities both phases show consistency. No further analysis is recommended.

6.3.3 Section 313.00–318.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 47 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-51.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.4 Section 318.00–323.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 118 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-52.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.5 Section 343.00–348.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 210 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. However no large pressure loss occurred. The injection rate decreased from 75 mL/min at start of the CHi phase to 10 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery).The injection phase is a little bit noisy but still amenable for quantitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the derivative of the CHi phase shows an upward trend at middle times followed by a kind of horizontal stabilization at late times. This behaviour is interpreted as a decrease of transmissivity at some distance from the borehole. The derivative of the CHir phase shows an upward trend at middle times as well but no stabilization at late time, indicating no formation flow stabilization was reached. Both phases are matched using a two shell composite radial flow model. The analysis is presented in Appendix 2-53.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present analysis the upward trend at middle times is interpreted as a change of flow dimension. The calculation based on the slope of the derivatives indicates a flow dimension of n2 = 1.68 (CHi phase) and n2 = 1.76 (CHir phase), respectively. A two shell composite flow model was used for the analysis of both phases. The analysis is presented in Appendix 2-53.

Selected representative parameters

The recommended transmissivity of $3.6 \cdot 10^{-9}$ m^2/s was derived from the radial flow analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-9}$ to $8.0 \cdot 10^{-9}$ m^2/s. Due to the low transmissivity no fresh water head was calculated.

The radial flow analyses of the CHi and CHir phases show consistency. No further analysis is recommended.

6.3.6 Section 348.00–353.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 82 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-54.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.7 Section 353.00–358.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 99 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-55.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.8 Section 358.00–363.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 130 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-56.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.9 Section 383.00–388.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 74 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-57.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.10 Section 388.00–393.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 108 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-58.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.11 Section 393.00–398.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 40 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-59.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.12 Section 398.00–403.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 234 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. However, no pressure loss occurred during the injection phase. The injection rate decreased from 7 mL/min at start of the CHi phase to 5 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the very low flow rate the recorded data of the flow rate is very noisy and the results of the CHi phase should be regarded carefully. The CHir shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. Due to the poor data quality the CHi phase is not very conclusive. However, in case of the present test an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. The CHir phase shows a downward trend at late times, which is typical for a transition from wellbore storage and skin dominated flow to pure formation flow. A two shell composite radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-60.

Generalized Radial Flow Analysis

In case of the present test both phases do not allow a specific determination of the flow dimension, because of the very poor data quality (CHi phase) and no flow stabilization (CHir phase). No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $3.0 \cdot 10^{-09}$ m^2/s was derived from the radial flow analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-10}$ to $6.0 \cdot 10^{-09}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,712.4 kPa.

The radial flow analyses of the CHi and CHir phases show consistency. No further analysis is recommended.

6.3.13 Section 423.00–428.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 60 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-61.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.14 Section 428.00–433.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 82 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-62.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.15 Section 433.00–438.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 200 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-63.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.16 Section 438.00–443.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a relatively medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 201 kPa. No hydraulic connection to the adjacent zones was observed. The automatic regulation system functioned relatively well, except for oscillations occurring at the beginning of the phase. However, the CHi phase is still analysable. The injection rate decreased from 75 mL/min at start of the CHi phase to 70 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery).

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test no clear trend could be observed for the derivative of the CHi phase. However, the CHi phase was analysed using an infinite acting homogenous radial flow model. The derivative of the CHir phase shows a horizontal stabilization at late times. A homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-64.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. The flow dimension calculated by the slope of the CHi derivative is n = 2.2. For the analysis of the CHi phases a homogeneous flow model was chosen. The flow dimension displayed during the CHir phase is n = 2 and no generalized radial flow analysis was performed. The analysis is presented in Appendix 2-64.

Selected representative parameters

The recommended transmissivity of $1.9 \cdot 10^{-7}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better derivative stabilization. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-8}$ to $5.0 \cdot 10^{-7}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,087.3 kPa.

The radial flow analyses of the CHi and CHir phases show consistency. No further analysis is recommended.

6.3.17 Section 442.00–447.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

After closing the testvalve the pressure in the test section rose by approx. 10 kPa. This can be explained either by prolonged packer expansion in a relatively tight section or by the fact that the initial formation pressure is higher than the pressure measured on test depth. During the brief injection phase of the pulse injection a total volume of about 8 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 210 kPa.

Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $3.8 \cdot 10^{-11}$ m³/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. Due to the strong influence of the packer expansion the pressure before inflation has been assumed to be the initial formation pressure. Therefore the results of the late time derivative (e.g. outer zone transmissivity) should be regarded carefully. In case of the present analysis the PI phase was matched using a radial composite flow model with increasing transmissivity at some distance from the borehole. The analysis is presented in Appendix 2-65.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of this analysis the downward trend at middle and late times of the derivative is interpreted as change of flow dimension. For the generalized radial flow analysis a composite flow model with n1 = 2 and n2 = 2.23 was used. The analysis is presented in Appendix 2-65.

Selected representative parameters

The recommended transmissivity of $1.2 \cdot 10^{-10}$ m²/s was derived from the radial flow analysis of the Pi phase (inner zone). The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-11}$ to $3.0 \cdot 10^{-10}$ m²/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.3.18 Section 447.00–452.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a relatively low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 201 kPa. No hydraulic connection to the adjacent zones was observed. The automatic regulation system worked relatively well, except some oscillations at the start of the injection. Due to the low flow rate the recorded data is a little bit noisy. However, the CHi phase is adequate for analysis. The injection rate decreased from 18 mL/min at start of the CHi phase to 13 mL/min at the end, indicating a relatively low interval transmissivity (consistent with the pulse recovery). The CHir shows a fast recovery, which adds uncertainty to the derivative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. The response of the CHir phase is consistent with the presence of a large skin, which in turn, is not consistent with the response observed during the CHi phase. A homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-66.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivative of the CHi phase indicates a flow dimension of 2. For this reason no generalized radial flow analysis was performed. The CHir phase does not allow a specific determination of the flow dimension, because of no clear flow stabilization. No generalized radial flow analysis was performed for the CHir phase.

Selected representative parameters

The recommended transmissivity of $1.4 \cdot 10^{-08}$ m^2/s was derived from the radial flow analysis of the CHi phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-09}$ to $3.0 \cdot 10^{-08}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,174.5 kPa.

The radial flow analysis of the CHi and CHir phases show little inconsistency, which can be attributed to the fast recovery of the CHir phase. No further analysis is recommended.

6.3.19 Section 452.00–457.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a relatively low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 208 kPa. No hydraulic connection to the adjacent zones was observed. The automatic regulation system worked relatively well, except some oscillations at the start of the injection. Due to the relatively low flow rate the recorded data is noisy. The injection rate decreased from approx. 22 mL/min at start of the CHi phase to 17 mL/min at the end, indicating a relatively low interval transmissivity (consistent with the pulse recovery). The CHir phase shows a relatively fast recovery, which adds uncertainty to the derivative analyses. However, both phases are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the CHi phase (although noisy) shows a relatively flat derivative which can be interpreted as radial flow. A radial homogeneous flow model was used to analyse the CHi phase. The derivative of the CHir phase shows a unit slope downward trend at middle times, indicating a large positive skin. There is a slight indication of stabilization in the late time derivative. The CHir phase is matched using a radial homogeneous flow model. The analysis is presented in Appendix 2-67.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivative of the CHi phase is a little bit noisy and shows a horizontal stabilization, indicating a flow dimension $n = 2$. Due to the noise in the data the interpretation of the flow dimension should be regarded carefully. No generalized radial flow analysis was performed. Due to the fast recovery and no clear flow stabilization of the CHir phase, no generalized radial flow analysis was performed, either. The analysis is presented in Appendix 2-67.

Selected representative parameters

The recommended transmissivity of $2.2 \cdot 10^{-8}$ m^2/s was derived from the radial flow analysis of the CHi phase, which shows better data quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-9}$ to $4.0 \cdot 10^{-8}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,220.6 kPa.

The radial flow analyses of the CHi and CHir phases show inconsistency in the derived transmissivities, which is attributed to the fast recovery of the CHir phase. The fast recovery may be caused by non-Darcy flow effects in the formation. No further analysis is recommended.

6.3.20 Section 457.00–462.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 170 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-68.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.21 Section 462.00–467.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 108 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–11 m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-69.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.22 Section 483.00–488.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 90 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-70.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.23 Section 488.00–493.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 90 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-71.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.24 Section 493.00–498.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

After closing the testvalve the pressure in the test section rose by approx. 10 kPa and drops after approx. 0.5 h. This can be explained by prolonged packer expansion in a relatively tight section. During the brief injection phase of the pulse injection a total volume of about 3 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 226 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.2 \cdot 10^{-11}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the derivative of the deconvoluted PI pressure shows a horizontal stabilization at middle and late times indicating radial flow. An infinite acting homogeneous radial flow model was used for the analysis. The analysis is presented in Appendix 2-72.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of this analysis the calculation of the flow dimension based on the slope of derivative shows a flow dimension of n = 2 (radial flow). Therefore no generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $2.6 \cdot 10^{-10}$ m²/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-11}$ to $4.0 \cdot 10^{-10}$ m²/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.3.25 Section 498.00–503.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 241 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. However, no pressure loss occurred during the injection phase. The injection rate decreased from 8 mL/min at start of the CHi phase to 5 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the low flow rate the recorded data of the flow rate is noisy and the results of the CHi phase should be regarded carefully. The CHir shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. Due to the poor data quality the CHi phase is not very conclusive. However, in case of the present test an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. The CHir phase shows a downward trend at late times, which is typical for a transition from wellbore storage and skin dominated flow to pure formation flow. A composite radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-73.

Generalized Radial Flow Analysis

In case of the present test both phases do not allow a specific determination of the flow dimension, because of the poor data quality (CHi phase) and no flow stabilization (CHir phase). No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $2.5\cdot10^{-9}$ m^2/s was derived from the radial flow analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0\cdot10^{-10}$ to $5.0\cdot10^{-09}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,650.5 kPa.

The radial flow analyses of the CHi and CHir phases show inconsistency regarding the chosen flow model. This inconsistency can be attributed to the poor data quality of the CHi phase. However, regarding the derived transmissivities, both phases show consistency. No further analysis is recommended.

6.3.26 Section 503.00–508.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 182 kPa. No hydraulic connection to the adjacent zones was observed. The automatic regulation system functioned well, except the oscillations at the beginning of the injection phase. The recorded data is however noisy, but still analysable. The injection rate decreased from approx 25 mL/min at start of the CHi phase to 17 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). The CHir phase shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. No clear flow stabilization was reached during the CHir phase and the data is still influenced by wellbore effects like wellbore storage and skin. However, a homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-74.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivative of the CHi show a slight downward trend. The flow dimension calculated by the slope of the derivative is $n = 2.1$. Due to the fact that the data of the CHi phase is relatively noisy, the results should be regarded carefully. A homogeneous flow model was chosen for the analysis of the CHi phase. No clear flow stabilization was reached during the CHir phase. This does not allow a specific determination of the flow dimension. The analysis is presented in Appendix 2-74.

Selected representative parameters

The recommended transmissivity of $1.1\cdot10^{-08}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $7.0\cdot10^{-09}$ to $5.0\cdot10^{-08}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,687.3 kPa.

The radial flow analyses of the CHi and CHir phases show consistency. No further analysis is recommended.

6.3.27 Section 508.00–513.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 199 kPa. No hydraulic connection to the adjacent zones was observed. The start of the injection phase was a little bit noisy. The injection rate decreased from 48 mL/min at start of the CHi phase to 16 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). The recovery was measured 2 h. Both phases show no problems and are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the CHi derivative shows a slight upward trend and an infinite acting homogenous radial flow model was used. The CHir phase shows an upward trend at middle times and an indication of stabilization at late times. This behaviour is interpreted as a change of transmissivity at some distance from the borehole. A two shell composite radial flow model was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-75.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the slight upward trend of the CHi derivative is interpreted as a flow dimension of n = 1.9. A homogenous flow model was used for the analysis of the CHi phase. The derivative of the CHir phase is interpreted as a change of flow dimension at some distance form the borehole. A composite flow model with n1 = 2 and n2 = 1.86 was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-75.

Selected representative parameters

The recommended transmissivity of $1.3 \cdot 10^{-08}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-09}$ to $3.0 \cdot 10^{-08}$ m^2/s (this range includes the derived transmissivity from the CHi phase). The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,738.8 kPa.

The radial flow analyses of the CHi and CHir phases show inconsistency as far as the flow model concerned which can be attributed to the noise in the early data of the CHi phase. No further analysis is recommended.

6.3.28 Section 513.00–518.00 m, test no. 1–3, injection

Comments to test

Due to a technical problem with the regulation unit the test was repeated. The third test in this interval worked well.

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a relatively high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 201 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 1.7 L/min at start of the CHi phase to 1.2 L/min at the end, indicating a relatively high interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the derivatives of both phases show a clear horizontal stabilization at middle and late times. A homogeneous radial flow model was used for the analysis of both phases. The analysis is presented in Appendix 2-76.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test both phases show a clear horizontal stabilization which is indicative for a flow dimension of 2 (radial flow). For this reason no generalized radial flow analysis was necessary.

Selected representative parameters

The recommended transmissivity of $4.0 \cdot 10^{-6}$ m^2/s was derived from the radial flow analysis of the CHir phase, because it shows the most clear derivative stabilization. The confidence range for the interval transmissivity is estimated to be $2.0 \cdot 10^{-6}$ to $6.0 \cdot 10^{-6}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,794.0 kPa.

The radial flow analyses of the CHi and CHir phases show consistency. No further analysis is recommended.

6.3.29 Section 518.00–523.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a relatively high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 5.7 L/min at start of the CHi phase to 3.1 L/min at the end, indicating a relatively high interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the CHi and CHir phases show a flat derivative at middle and late times, indicating formation flow stabilization and radial flow. Both phases are analysed using a radial homogeneous flow model. The analysis is presented in Appendix 2-77.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivative of both phases show a horizontal stabilization with a slope of 0, indicating a flow dimension n = 2. Therefore no generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $4.7 \cdot 10^{-6}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $2.0 \cdot 10^{-6}$ to $7.0 \cdot 10^{-6}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,837.1 kPa.

The radial flow analyses of the CHi and CHir phases show good consistency. No further analysis is recommended.

6.3.30 Section 523.00–528.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 201 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 15 mL/min at start of the CHi phase to 9 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the low flow rate the recorded data of the flow rate is noisy and the results of the CHi phase should be regarded carefully. The CHir shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. Due to the poor data quality the CHi phase is not very conclusive. However, in case of the present test an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. The CHir phase shows a downward trend at late times, which is typical for a transition from wellbore storage and skin dominated flow to pure formation flow. A homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-78.

Generalized Radial Flow Analysis

In case of the present test both phases do not allow a specific determination of the flow dimension, because of the poor data quality (CHi phase) and no flow stabilization (CHir phase). No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $4.2 \cdot 10^{-8}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-8}$ to $7.0 \cdot 10^{-8}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,881.0 kPa.

The radial flow analyses of the CHi and CHir phases show little inconsistency regarding the derived transmissivity. This inconsistency can be attributed to the poor data quality of the CHi phase. No further analysis is recommended.

6.3.31 Section 528.00–533.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from approx. 700 mL/min at start of the CHi phase to 50 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery).Both phases show no problems and are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present analysis the Chi phase (although a little bit noisy) shows a relatively flat derivative. An infinite acting homogenous radial flow model was used for the analysis of the CHi phase. The CHir phase shows a slight horizontal stabilization at middle times and a downward trend at late times, which is typical for a change of transmissivity away from the borehole. A two shell composite radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-79.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present analysis the CHi phase does not allow a specific determination of the flow dimension and no generalized radial flow analysis was performed for this phase. The calculated flow dimension based on the slope of the CHir derivative shows a flow dimension of $n = 3$ (spherical). A homogeneous flow model was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-79.

Selected representative parameters

The recommended transmissivity of $6.7 \cdot 10^{-8}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $3.0 \cdot 10^{-8}$ to $9.0 \cdot 10^{-8}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,932.1 kPa.

The radial flow analyses of the CHi and CHir phases show inconsistency regarding the chosen flow models. If further analysis is planned, a total test simulation should help resolving this inconsistency.

6.3.32 Section 533.00–538.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 199 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 190 mL/min at start of the CHi phase to 100 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHi phase is a little bit noisy, which can be attributed to the automatic regulation unit which was switching between the injection pump and the injection vessel. The CHir phase shows a relatively fast recovery. Both phases show no problems and are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present analysis both phases are matched using a homogeneous radial flow model. The analysis is presented in Appendix 2-80.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. The flow dimension calculated by the slope of the CHi derivative is n = 2.3. A homogeneous flow model was used to match the CHi phase. No generalized radial flow analysis was performed for the CHir phase. The analysis is presented in Appendix 2-80.

Selected representative parameters

The recommended transmissivity of $3.7 \cdot 10^{-7}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-8}$ to $6.0 \cdot 10^{-7}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,980.7 kPa.

The radial flow analyses of the CHi and CHir phases show good consistency, with the exception of the very high skin derived from the CHir phase. No further analysis is recommended.

6.3.33 Section 538.00–543.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 242 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. Because of this, the pressure decreased during the injection by approx. 1 kPa. The injection rate decreased from 8 mL/min at start of the CHi phase to 2 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Because of the low flow rate the recorded data of the flow rate is noisy and the results of the CHi phase should be regarded carefully. The CHir shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. Due to the poor data quality the CHi phase is not very conclusive. However, in case of the present test an infinite acting homogenous radial flow model was used for the analysis of the CHi phase. The CHir phase shows a downward trend at late times, which is typical for a transition from wellbore storage and skin dominated flow to pure formation flow. A homogeneous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-81.

Generalized Radial Flow Analysis

In case of the present test both phases do not allow a specific determination of the flow dimension, because of the poor data quality (CHi phase) and no flow stabilization (CHir phase). No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $4.1 \cdot 10^{-9}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-9}$ to $1.0 \cdot 10^{-8}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,028.7 kPa.

The radial flow analyses of the CHi and CHir phases show consistency. No further analysis is recommended.

6.3.34 Section 563.00–568.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 63 kPa in 25 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-82.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.35 Section 568.00–573.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 60 kPa in 25 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-83.

Selected representative parameters

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.36 Section 573.00–578.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a relatively high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. A hydraulic connection between test interval and bottom zone (the pressure rose by 13 kPa during injection) was observed. The automatic regulation unit functioned well. However, the recorded data of the Chi phase is noisy. The injection rate decreased from 5.5 L/min at start of the CHi phase to 4.1 L/min at the end, indicating a relatively high interval transmissivity (consistent with the pulse recovery). The CHir phase shows a relative fast recovery. Both phases are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the derivative of the CHi phase is very noisy. However, a homogeneous radial flow model was used for the analysis of the CHi phase. The CHir phase shows a flat derivative at middle and late times, indicating radial flow. A homogeneous radial flow model with wellbore storage and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-84.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase does not allow a specific determination of the flow dimension, because of the poor data quality. The derivative of the CHir phase shows a horizontal stabilization with a slope of 0, indicating a flow dimension n = 2. Therefore no generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $1.5 \cdot 10^{-5}$ m^2/s was derived from the radial flow analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-6}$ to $3.0 \cdot 10^{-5}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,350.3 kPa.

The radial flow analyses of the CHi and CHir phases show good consistency, with the exception of a relatively high skin derived from the CHir phase. No further analysis is recommended.

6.3.37 Section 578.00–583.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a relatively high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 201 kPa. The pressure rose by 6 kPa in the bottom zone during the injection indicating a connection to the adjacent zone. The injection rate decreased from 7.5 L/min at start of the CHi phase to 5.6 L/min at the end, indicating a relatively high interval transmissivity (consistent with the pulse recovery). The CHir phase shows a relative fast recovery. Both phases are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the derivative of the CHi phase is relatively flat and a homogeneous radial flow model was used for the analysis of this phase. The CHir phase shows a flat derivative at middle and late times, indicating radial flow. A homogeneous radial flow model with wellbore storage and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-85.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present analysis the slope of the derivative of the CHi phase indicates a flow dimension of 2.1. A homogeneous flow model was used for the analysis of the CHi phase. The analysis is presented in Appendix 2-85. No generalized radial flow analysis was performed for the CHir phase.

Selected representative parameters

The recommended transmissivity of $1.0\cdot10^{-5}$ m^2/s was derived from the radial flow analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0\cdot10^{-6}$ to $3.0\cdot10^{-5}$ m^2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,397.7 kPa.

The radial flow analyses of the CHi and CHir phases show good consistency, with the exception of a relatively high skin derived from the CHir phase. No further analysis is recommended.

6.3.38 Section 583.00–588.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

After closing the testvalve the pressure in the test section rose by approx. 4 kPa. This can be explained by prolonged packer expansion in a relatively tight section. During the brief injection phase of the pulse injection a total volume of about 3 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 242 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.2 \cdot 10^{-11}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present analysis the deconvoluted PI pressure was matched using an infinite acting homogeneous radial flow model. The analysis is presented in Appendix 2-86.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of this analysis the calculation of the flow dimension based on the slope of derivative shows a flow dimension of n = 1.4. A homogeneous flow model was used for the analysis of the PI phase. The analysis is presented in Appendix 2-86.

Selected representative parameters

The recommended transmissivity of $1.2 \cdot 10^{-11}$ m^2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-12}$ to $4.0 \cdot 10^{-11}$ m^2/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.3.39 Section 588.00–593.00 m, test no. 1, pulse injection

Comments to test

The intention was to design the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and opening/closing the test valve for conducting the preliminary pulse injection, no pulse recovery was observed and the pressure stayed stable for approx. 40 minutes. This phenomenon is caused by a combination of prolonged packer expansion and a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m^2/s). None of the test phases is analysable.

No analysis was performed. The measured data is presented in Appendix 2-87.

Selected representative parameters

Based on the test response the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m^2/s.

No further analysis recommended.

6.3.40 Section 593.00–598.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

During the brief injection phase of the pulse injection a total volume of about 5 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 238 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.9 \cdot 10^{-11}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the derivative of the PI phase shows an upward trend at early times followed by a kind of stabilization at late times. The PI phase was matched using a radial homogeneous flow model. The analysis is presented in Appendix 2-88.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test no reliable flow dimension can be calculated by the slope of derivative. No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $4.2 \cdot 10^{-12}$ m^2/s was derived from the radial flow analysis of the PI phase. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-12}$ to $7.0 \cdot 10^{-12}$ m^2/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.3.41 Section 598.00–603.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The recovery of the pulse test indicated a medium formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from approx 0.5 L/min at start of the CHi phase to 0.3 L/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the CHi derivative shows a horizontal stabilization at middle times followed by an upward trend at late times. A two shell composite flow model with decreasing transmissivity at some distance from the test interval was used for the analysis of the CHi phase. The response of the CHir phase is consistent with the CHi phase and a two shell composite flow model was used for the analysis as well. The analysis is presented in Appendix 2-89.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the both phases do not allow a reliable calculation of the flow dimension. No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $3.8 \cdot 10^{-07}$ m^2/s was derived from the radial flow analysis of the CHi phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-08}$ to $9.0 \cdot 10^{-07}$ m^2/s (this range includes the derived transmissivity from the CHir phase). The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,583.6 kPa.

The radial flow analyses of the CHi and CHir phases show relative good consistency. No further analysis is recommended.

6.3.42 Section 663.00–668.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The relatively slow recovery of the pulse test indicated a low formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 232 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. However, no large pressure loss occurred during the injection phase. The injection rate decreased from 5 mL/min at start of the CHi phase to 3 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the low flow rate the recorded data of the flow rate is noisy but is still amenable for qualitative analysis. The CHir shows no problems and is adequate for quantitative analysis.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the derivative of the CHi phase is noisy. However, the CHi phase was matched using a radial flow composite model with decreasing transmissivity away from the borehole. No clear flow stabilization was reached during the CHir phase and the data is still influenced by wellbore effects like wellbore storage and skin. A two shell composite radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-90.

Generalized Radial Flow Analysis

In case of the present test both phases do not allow a specific determination of the flow dimension, because of the noisy data (CHi phase) and no clear flow stabilization (CHir phase). No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $1.3 \cdot 10^{-10}$ m²/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-11}$ to $4.0 \cdot 10^{-10}$ m²/s. Due to the low transmissivity no fresh water head was calculated.

The radial flow analyses of the CHi and CHir phases show consistency. No further analysis is recommended.

6.3.43 Section 668.00–673.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

After closing the testvalve the pressure in the test section rose by approx. 6 kPa. This can be explained by prolonged packer expansion in a relatively tight section. During the brief injection phase of the pulse injection a total volume of about 4 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 231 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.7 \cdot 10^{-11}$ m³/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present analysis the deconvoluted PI pressure was matched using an infinite acting homogeneous radial flow model. The analysis is presented in Appendix 2-91.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of this analysis the calculation of the flow dimension based on the slope of derivative shows a flow dimension of n = 1.6. A homogeneous flow model was used for the analysis of the PI phase. The analysis is presented in Appendix 2-91.

Selected representative parameters

The recommended transmissivity of $1.2 \cdot 10^{-11}$ m²/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-12}$ to $4.0 \cdot 10^{-11}$ m²/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.3.44 Section 673.00–678.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

During the brief injection phase of the pulse injection a total volume of about 3 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 246 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.2 \cdot 10^{-11}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present analysis the deconvoluted PI pressure show a horizontal stabilization at early times and a short downward trend at middle times followed by a new stabilization at a lower level. This behaviour is consistent with an increase of transmissivity at some distance from the borehole. A two shell composite radial flow model was used for the analysis of the PI phase. The analysis is presented in Appendix 2-91.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of this analysis the calculated flow dimension is n = 2 (radial flow). No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $9.0 \cdot 10^{-11}$ m^2/s was derived from the radial flow analysis of the PI phase (inner zone). The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-11}$ to $2.0 \cdot 10^{-10}$ m^2/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.3.45 Section 678.00–683.00 m, test no. 1, pulse injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The very slow recovery of the pulse test indicated a very low formation transmissivity. Based on this result no constant pressure injection test was performed. Instead, the recovery of the pulse injection test was analysed.

After closing the testvalve the pressure in the test section rose by approx. 4 kPa. This can be explained by prolonged packer expansion in a relatively tight section. During the brief injection phase of the pulse injection a total volume of about 4 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 246 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.5 \cdot 10^{-11}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

Radial Flow Analysis

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present analysis the deconvoluted PI pressure was matched using an infinite acting homogeneous radial flow model. The analysis is presented in Appendix 2-93.

Generalized Radial Flow Analysis

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. In case of this analysis the calculation of the flow dimension shows a flow dimension of n = 2 (radial flow). No generalized radial flow analysis was performed.

Selected representative parameters

The recommended transmissivity of $8.4 \cdot 10^{-11}$ m^2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $6.0 \cdot 10^{-11}$ to $1.0 \cdot 10^{-10}$ m^2/s. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

7 Synthesis

The synthesis chapter summarizes the basic test parameters and analysis results. In addition, the correlation between steady state and transient transmissivities as well as between the matched and the theoretical wellbore storage (WBS) coefficient are presented and discussed.

7.1 Summary of results

Table 7-1. General test data from constant head injection tests in KLX11A (for nomenclature see Appendix 4).

Borehole secup (m)	Borehole seclow (m)	Date and time for test, start YYYYMMDD hh:mm	Date and time for test, stop YYYYMMDD hh:mm	Q_p (m**3/s)	Q_m (m**3/s)	t_p (s)	t_F (s)	p_0 (kPa)	p_i (kPa)	p_p (kPa)	p_F (kPa)	Te_w (°C)	Test phases measured Analysed test phases marked bold
103.00	203.00	060629 14:32:00	060629 16:40:00	1.31E–04	1.37E–04	1,800	1,800	1,842	1,837	2,035	1,840	9.6	**CHi / CHir**
203.00	303.00	060629 18:03:00	060629 20:21:00	1.52E–04	1.53E–04	1,800	1,800	2,780	2,776	2,975	2,777	11.1	**CHi / CHir**
303.00	403.00	060630 09:15:00	060630 11:12:00	5.67E–05	5.83E–05	1,800	1,800	3,714	3,712	3,907	3,713	12.6	**CHi / CHir**
403.00	503.00	060630 13:11:00	060630 15:20:00	1.17E–06	1.33E–06	1,800	1,800	4,653	4,650	4,854	4,650	14.0	**CHi / CHir**
503.00	603.00	060701 08:47:00	060701 10:50:00	1.91E–04	1.98E–04	1,800	1,800	5,578	5,580	5,795	5,600	15.6	**CHi / CHir**
603.00	703.00	060701 12:14:00	060701 15:43:00	3.33E–08	5.00E–08	1,800	3,600	6,514	6,549	6,754	6,586	17.1	**CHi / CHir**
703.00	803.00	060701 17:09:00	060702 01:32:00	3.33E–08	6.67E–08	1,800	21,600	7,443	7,477	7,680	7,451	18.6	**CHi / CHir**
803.00	903.00	060702 09:11:00	060702 13:33:00	6.67E–08	1.00E–07	1,800	7,200	8,351	8,354	8,589	8,352	20.1	**CHi / CHir**
876.00	976.00	060702 14:45:00	060702 16:49:00	#NV	#NV	10	3,978	9,027	9,042	9,253	9,202	21.2	**Pi**
103.00	123.00	060704 08:19:00	060704 09:46:00	2.33E–05	2.33E–05	1,200	1,200	1,091	1,093	1,293	1,093	8.4	**CHi / CHir**
123.00	143.00	060704 10:31:00	060704 11:54:00	6.50E–05	6.67E–05	1,200	1,200	1,279	1,275	1,475	1,275	8.7	**CHi / CHir**
143.00	163.00	060704 12:49:00	060704 14:32:00	6.67E–06	8.33E–06	1,200	1,800	1,469	1,464	1,671	1,469	8.9	**CHi / CHir**
163.00	183.00	060704 15:05:00	060704 16:33:00	4.17E–05	4.33E–05	1,200	1,200	1,656	1,648	1,849	1,651	9.2	**CHi / CHir**
183.00	203.00	060704 17:12:00	060704 18:14:00	#NV	#NV	#NV	#NV	1,844	#NV	#NV	#NV	9.5	**#NV**

Borehole secup (m)	Borehole seclow (m)	Date and time for test, start YYYYMMDD hh:mm	Date and time for test, stop YYYYMMDD hh:mm	Q_p (m**3/s)	Q_m (m**3/s)	t_p (s)	t_F (s)	p_0 (kPa)	p_i (kPa)	p_p (kPa)	p_F (kPa)	Te_w (°C)	Test phases measured Analysed test phases marked bold
203.00	223.00	060704 18:50:00	060704 19:46:00	#NV	#NV	#NV	#NV	2,031	#NV	#NV	#NV	9.8	**#NV**
223.00	243.00	060705 08:38:00	060705 10:07:00	#NV	#NV	10	2,700	2,216	2,233	2,458	2,255	10.0	**Pi**
243.00	263.00	060705 10:48:00	060705 12:22:00	6.67E–07	7.00E–07	1,200	1,200	2,406	2,403	2,616	2,402	10.4	**CHi / CHir**
263.00	283.00	060705 13:18:00	060705 14:44:00	1.65E–04	1.69E–04	1,200	1,200	2,594	2,588	2,789	2,590	10.8	**CHi / CHir**
283.00	303.00	060705 15:25:00	060705 16:51:00	#NV	#NV	10	2,700	2,781	2,797	3,034	2,958	11.1	**Pi**
303.00	323.00	060705 17:25:00	060705 18:49:00	6.50E–05	6.83E–05	1,200	1,200	2,967	2,963	3,187	2,964	11.5	**CHi / CHir**
323.00	343.00	060705 19:21:00	060706 00:42:00	8.33E–09	5.00E–09	660	14,400	3,155	3,159	3,377	3,155	11.8	**CHi / CHir**
343.00	363.00	060706 08:48:00	060706 10:30:00	1.50E–07	3.00E–07	1,200	1,200	3,339	3,356	3,551	3,443	12.1	**CHi / CHir**
363.00	383.00	060706 11:03:00	060706 12:55:00	#NV	#NV	10	3,960	3,530	3,536	3,753	3,693	12.3	**Pi**
383.00	403.00	060706 13:34:00	060706 15:02:00	8.33E–08	8.33E–08	1,200	1,200	3,717	3,715	3,954	3,712	12.6	**CHi / CHir**
403.00	423.00	060706 15:54:00	060706 17:22:00	#NV	#NV	10	2,460	3,903	3,908	4,141	4,062	12.9	**Pi**
423.00	443.00	060706 17:56:00	060706 19:21:00	1.00E–06	1.00E–06	1,200	1,200	4,090	4,088	4,290	4,087	13.2	**CHi / CHir**
443.00	463.00	060707 08:32:00	060707 10:01:00	5.00E–07	4.92E–07	1,200	1,200	4,271	4,269	4,513	4,269	13.5	**CHi / CHir**
463.00	483.00	060707 10:33:00	060707 12:34:00	#NV	#NV	10	4,500	4,461	4,485	4,698	4,572	13.8	**Pi**
483.00	503.00	060707 13:12:00	060707 14:44:00	1.17E–07	1.33E–07	1,200	1,200	4,650	4,649	4,899	4,642	14.0	**CHi / CHir**

Borehole secup (m)	Borehole seclow (m)	Date and time for test, start YYYYMMDD hh:mm	Date and time for test, stop YYYYMMDD hh:mm	Q_p (m**3/s)	Q_m (m**3/s)	t_p (s)	t_F (s)	p_0 (kPa)	p_i (kPa)	p_p (kPa)	p_F (kPa)	Te_w (°C)	Test phases measured Analysed test phases marked bold
503.00	523.00	060707 15:12:00	060707 16:39:00	5.83E–05	6.17E–05	1,200	1,200	4,838	4,837	5,037	4,838	14.4	**CHi / CHir**
523.00	543.00	060707 17:07:00	060707 18:30:00	1.33E–06	1.33E–06	1,200	1,200	5,025	5,024	5,228	5,023	14.6	**CHi / CHir**
543.00	563.00	060707 19:07:00	060708 08:26:00	#NV	#NV	10	45,360	5,211	5,219	5,439	5,349	15.0	**Pi**
563.00	583.00	060708 08:58:00	060708 10:21:00	1.47E–04	1.52E–04	1,200	1,200	5,395	5,392	5,590	5,394	15.1	**CHi / CHir**
583.00	603.00	060708 10:53:00	060708 12:23:00	4.33E–06	4.50E–06	1,200	1,200	5,583	5,585	5,786	5,590	15.6	**CHi / CHir**
603.00	623.00	060708 13:17:00	060708 14:41:00	#NV	#NV	10	2,460	5,772	5,778	6,021	5,930	15.9	**Pi**
623.00	643.00	060708 15:12:00	060708 16:39:00	#NV	#NV	10	2,460	5,957	5,963	6,183	6,172	16.2	**Pi**
643.00	663.00	060708 17:11:00	060708 18:34:00	#NV	#NV	10	2,400	6,144	6,153	6,368	6,133	16.5	**Pi**
663.00	683.00	060708 19:06:00	060709 08:39:00	1.67E–08	3.67E–08	1,200	1,200	6,332	6,327	6,583	6,411	16.8	**CHi / CHir**
683.00	703.00	060709 09:11:00	060709 10:40:00	#NV	#NV	10	2,520	6,513	6,516	6,740	6,556	17.1	**Pi**
703.00	723.00	060709 11:08:00	060709 13:27:00	5.00E–08	8.47E–08	1,200	2,400	6,700	6,718	6,928	6,761	17.3	**CHi / CHir**
723.00	743.00	060709 13:58:00	060709 15:13:00	#NV	#NV	#NV	#NV	6,886	#NV	#NV	#NV	17.6	**#NV**
743.00	763.00	060709 15:45:00	060709 16:56:00	#NV	#NV	#NV	#NV	7,070	#NV	#NV	#NV	17.9	**#NV**
763.00	783.00	060709 17:25:00	060709 18:10:00	#NV	#NV	#NV	#NV	7,254	#NV	#NV	#NV	18.2	**#NV**
783.00	803.00	060709 18:43:00	060709 20:01:00	#NV	#NV	#NV	#NV	7,439	#NV	#NV	#NV	18.5	**#NV**

Borehole secup (m)	**Borehole seclow (m)**	**Date and time for test, start YYYYMMDD hh:mm**	**Date and time for test, stop YYYYMMDD hh:mm**	**Q_p (m**3/s)**	**Q_m (m**3/s)**	**t_p (s)**	**t_F (s)**	**p_0 (kPa)**	**p_i (kPa)**	**p_p (kPa)**	**p_F (kPa)**	**Te_w (°C)**	**Test phases measured Analysed test phases marked bold**
803.00	823.00	060710 08:19:00	060710 09:15:00	#NV	#NV	#NV	#NV	7,623	#NV	#NV	#NV	18.8	**#NV**
823.00	843.00	060710 09:45:00	060710 10:37:00	#NV	#NV	#NV	#NV	7,807	#NV	#NV	#NV	19.1	**#NV**
843.00	863.00	060710 11:10:00	060710 13:24:00	6.67E–08	1.05E–07	1,200	1,200	7,794	7,983	8,223	8,013	19.5	**CHi / CHir**
863.00	883.00	060710 14:04:00	060710 14:56:00	#NV	#NV	#NV	#NV	8,180	#NV	#NV	#NV	19.8	**#NV**
303.00	308.00	060712 07:38:00	060712 09:06:00	1.06E–05	1.16E–05	1,200	1,200	2,828	2,823	3,024	2,823	11.1	**CHi / CHir**
308.00	313.00	060712 09:30:00	060712 10:51:00	5.33E–05	5.61E–05	1,200	1,200	2,875	2,871	3,071	2,871	11.3	**CHi / CHir**
313.00	318.00	060712 11:13:00	060706 15:02:00	#NV	#NV	#NV	#NV	2,925	#NV	#NV	#NV	11.4	**#NV**
318.00	323.00	060712 13:09:00	060712 12:03:00	#NV	#NV	#NV	#NV	2,972	#NV	#NV	#NV	11.5	**#NV**
343.00	348.00	060712 14:31:00	060712 13:57:00	1.67E–07	3.33E–07	1,200	1,200	3,206	3,222	3,432	3,312	11.8	**CHi / CHir**
348.00	353.00	060712 16:38:00	060712 16:11:00	#NV	#NV	#NV	#NV	3,252	#NV	#NV	#NV	11.9	**#NV**
353.00	358.00	060712 17:56:00	060712 17:38:00	#NV	#NV	#NV	#NV	3,298	#NV	#NV	#NV	12.0	**#NV**
358.00	363.00	060713 07:52:00	060712 18:45:00	#NV	#NV	#NV	#NV	3,342	#NV	#NV	#NV	12.0	**#NV**
383.00	388.00	060713 09:14:00	060713 08:41:00	#NV	#NV	#NV	#NV	3,576	#NV	#NV	#NV	12.4	**#NV**
388.00	393.00	060713 10:28:00	060713 10:05:00	#NV	#NV	#NV	#NV	3,624	#NV	#NV	#NV	12.5	**#NV**
393.00	398.00	060713 12:29:00	060713 11:17:00	#NV	#NV	#NV	#NV	3,673	#NV	#NV	#NV	12.5	**#NV**

Borehole secup (m)	Borehole seclow (m)	Date and time for test, start YYYYMMDD hh:mm	Date and time for test, stop YYYYMMDD hh:mm	Q_p (m**3/s)	Q_m (m**3/s)	t_p (s)	t_F (s)	p_0 (kPa)	p_i (kPa)	p_p (kPa)	p_F (kPa)	Te_w (°C)	Test phases measured Analysed test phases marked bold
398.00	403.00	060713 13:44:00	060713 13:20:00	8.33E–08	8.33E–08	1,200	1,200	3,718	3,717	3,951	3,715	12.6	**CHi / CHir**
423.00	428.00	060713 15:46:00	060713 15:16:00	#NV	#NV	#NV	#NV	3,952	#NV	#NV	#NV	13.0	**#NV**
428.00	433.00	060713 16:59:00	060713 16:55:00	#NV	#NV	#NV	#NV	3,998	#NV	#NV	#NV	13.0	**#NV**
433.00	438.00	060714 07:59:00	060713 17:47:00	#NV	#NV	#NV	#NV	4,043	#NV	#NV	#NV	13.1	**#NV**
438.00	443.00	060714 09:17:00	060714 08:46:00	1.17E–06	1.16E–06	1,200	1,200	4,090	4,087	4,288	4,088	13.2	**CHi / CHir**
442.00	447.00	060714 11:06:00	060714 10:39:00	#NV	#NV	10	3,840	4,133	4,147	4,357	4,150	13.3	**Pi**
447.00	452.00	060714 13:16:00	060714 12:51:00	2.17E–07	2.17E–07	1,200	1,200	4,175	4,176	4,377	4,175	13.3	**CHi / CHir**
452.00	457.00	060714 15:01:00	060714 14:37:00	2.83E–07	2.95E–07	1,200	1,200	4,224	4,222	4,430	4,221	13.4	**CHi / CHir**
457.00	462.00	060714 16:45:00	060714 16:22:00	#NV	#NV	#NV	#NV	4,271	#NV	#NV	#NV	13.5	**#NV**
462.00	467.00	060714 18:01:00	060714 17:35:00	#NV	#NV	#NV	#NV	4,317	#NV	#NV	#NV	13.5	**#NV**
483.00	488.00	060715 08:16:00	060714 18:50:00	#NV	#NV	#NV	#NV	4,509	#NV	#NV	#NV	13.8	**#NV**
488.00	493.00	060715 09:29:00	060715 09:05:00	#NV	#NV	#NV	#NV	4,556	#NV	#NV	#NV	13.9	**#NV**
493.00	498.00	060715 10:47:00	060715 10:19:00	#NV	#NV	10	1500	4,605	4,613	4,839	4,617	14.0	**Pi**
498.00	503.00	060715 14:04:00	060715 13:39:00	8.33E–08	1.00E–07	1,200	1,200	4,655	4,652	4,893	4,652	14.0	**CHi / CHir**
503.00	508.00	060715 15:53:00	060715 15:29:00	2.83E–07	2.83E–07	1,200	1,200	4,700	4,705	4,887	4,735	14.1	**CHi / CHir**

Borehole secup (m)	Borehole seclow (m)	Date and time for test, start YYYYMMDD hh:mm	Date and time for test, stop YYYYMMDD hh:mm	Q_p (m**3/s)	Q_m (m**3/s)	t_p (s)	t_F (s)	p_0 (kPa)	p_i (kPa)	p_p (kPa)	p_F (kPa)	Te_w (°C)	Test phases measured Analysed test phases marked bold
508.00	513.00	060715 18:09:00	060715 17:47:00	2.67E–07	3.12E–07	1,200	7,200	4,747	4,751	4,950	4,746	14.2	**CHi / CHir**
513.00	518.00	060808 15:30:00	060808 17:15:00	1.93E–05	1.98E–05	1,200	1,200	4,797	4,795	4,996	4,794	14.3	**CHi / CHir**
518.00	523.00	060808 17:47:00	060808 19:37:00	5.12E–05	5.33E–05	1,200	1,200	4,844	4,842	5,042	4,844	14.4	**CHi / CHir**
523.00	528.00	060809 08:08:00	060809 09:41:00	1.43E–07	1.43E–07	1,200	1,200	4,884	4,885	5,086	4,884	14.5	**CHi / CHir**
528.00	533.00	060809 10:08:00	060809 11:34:00	7.83E–07	8.33E–07	1,200	1,200	4,931	4,932	5,132	4,931	14.6	**CHi / Chir**
533.00	538.00	060809 12:48:00	060809 14:16:00	1.67E–06	1.75E–06	1,200	1,200	4,983	4,981	5,180	4,981	14.6	**CHi / CHir**
538.00	543.00	060809 14:40:00	060809 16:19:00	3.33E–08	4.50E–08	1,200	1,200	5,028	5,032	5,274	5,032	14.7	**CHi / CHir**
563.00	568.00	060809 16:59:00	060809 17:53:00	#NV	#NV	#NV	#NV	5,262	#NV	#NV	#NV	15.0	**#NV**
568.00	573.00	060809 18:17:00	060809 19:11:00	#NV	#NV	#NV	#NV	5,308	#NV	#NV	#NV	15.1	**#NV**
573.00	578.00	060810 08:06:00	060810 09:34:00	6.85E–05	7.02E–05	1,200	1,200	5,349	5,350	5,550	5,351	15.2	**CHi / CHir**
578.00	583.00	060810 10:02:00	060810 11:28:00	9.33E–05	9.72E–05	1,200	1,200	5,398	5,397	5,598	5,399	15.1	**CHi / CHir**
583.00	588.00	060810 12:20:00	060810 14:15:00	#NV	#NV	10	3,888	5,447	5,452	5,694	5,519	15.4	**Pi**
588.00	593.00	060810 14:41:00	060810 16:05:00	#NV	#NV	#NV	#NV	5,262	#NV	#NV	#NV	15.4	**#NV**
593.00	598.00	060810 16:33:00	060810 18:19:00	#NV	#NV	10	3,679	5,540	5,546	5,784	5,719	15.5	**Pi**
598.00	603.00	060811 08:01:00	060811 09:26:00	4.48E–06	4.80E–06	1,200	1,200	5,582	5,582	5,782	5,586	15.6	**CHi / CHir**

Borehole secup (m)	**Borehole seclow (m)**	**Date and time for test, start YYYYMMDD hh:mm**	**Date and time for test, stop YYYYMMDD hh:mm**	**Q_p (m**3/s)**	**Q_m (m**3/s)**	**t_p (s)**	**t_F (s)**	**p_0 (kPa)**	**p_i (kPa)**	**p_p (kPa)**	**p_F (kPa)**	**Te_w (°C)**	**Test phases measured Analysed test phases marked bold**
663.00	668.00	060811 10:29:00	060811 13:01:00	1.67E–08	2.50E–08	1,200	1,200	6,188	6,196	6,428	6,261	16.5	**CHi / CHir**
668.00	673.00	060811 13:30:00	060811 15:14:00	#NV	#NV	10	3,582	6,237	6,245	6,458	6,366	16.6	**Pi**
673.00	678.00	060811 15:38:00	060811 17:22:00	#NV	#NV	10	3,693	6,283	62,88	6,534	6,296	16.7	**Pi**
678.00	683.00	060811 17:45:00	060811 20:53:00	#NV	#NV	10	9,105	6,329	6,332	6,578	6,338	16.8	**Pi**

#NV: Not analysed.

CHi: Constant Head injection phase.

CHir: Recovery phase following the constant head injection phase.

Pi: Pulse injection phase.

Table 7-2. Results from radial flow analysis of constant head tests in KLX11A (for nomenclature see Appendix 4).

Interval position		Stationary flow parameters		Transient analysis													Static conditions	
				Flow regime		Formation parameters												
up m btoc	low m btoc	Q/s m^2/s	TM m^2/s	Perturb. Phase	Recovery Phase	T_{f1} m^2/s	T_{f2} m^2/s	T_{s1} m^2/s	T_{s2} m^2/s	T_T m^2/s	T_{TMIN} m^2/s	T_{TMAX} m^2/s	C m^3/Pa	ξ –	dt_1 min	dt_2 min	p* kPa	h_{wif} m.a.s.l.
103.00	203.00	6.51E–06	8.47E–06	2	WBS2	1.6E–05	#NV	2.5E–05	#NV	1.6E–05	8.0E–06	3.0E–05	3.1E–09	6.7	0.73	21.10	1,838.6	11.45
203.00	303.00	7.48E–06	9.74E–06	2	WBS2	2.4E–05	#NV	3.2E–05	#NV	3.2E–05	9.0E–06	5.0E–05	2.3E–09	19.1	0.40	5.27	2,776.6	10.70
303.00	403.00	2.85E–06	3.71E–06	2	WBS22	6.9E–06	#NV	1.1E–05	6.0E–06	6.0E–06	3.0E–06	9.0E–06	4.4E–10	14.2	1.78	9.33	3,705.2	10.58
403.00	503.00	5.61E–08	7.31E–08	2	WBS2	2.1E–07	#NV	2.7E–07	#NV	2.7E–07	8.0E–08	6.0E–07	2.4E–10	20.2	#NV	#NV	4,649.1	12.21
503.00	603.00	8.72E–06	1.14E–05	2	WBS2	1.9E–05	#NV	2.4E–05	#NV	2.4E–05	8.0E–06	5.0E–05	3.3E–09	7.4	0.68	22.28	5,579.0	12.66
603.00	703.00	1.60E–09	2.08E–09	2	WBS2	5.3E–10	#NV	2.3E–10	#NV	2.3E–10	9.0E–11	6.0E–10	1.9E–10	–1.9	#NV	#NV	6,513.4	14.05
703.00	803.00	1.61E–09	2.10E–09	2	WBS2	2.9E–10	#NV	2.0E–10	#NV	2.0E–10	9.0E–11	4.0E–10	2.4E–10	–2.7	#NV	#NV	7,429.3	14.06
803.00	903.00	3.62E–09	2.78E–09	2	WBS2	9.8E–10	#NV	2.9E–09	#NV	2.9E–09	8.0E–10	4.0E–09	3.1E–10	1.7	#NV	#NV	8,333.1	13.37
876.00	976.00	#NV	#NV	#NV	2	#NV	#NV	4.0E–11	#NV	4.0E–11	1.0E–11	8.0E–11	2.6E–10	–1.5	#NV	#NV	#NV	#NV
103.00	123.00	1.14E–06	1.20E–06	2	WBS2	2.1E–06	#NV	4.9E–06	#NV	4.9E–06	3.0E–06	8.0E–06	6.3E–10	19.7	0.61	6.73	1,092.9	10.46
123.00	143.00	3.19E–06	3.34E–06	22	WBS22	9.4E–06	1.5E–05	8.1E–06	2.8E–05	8.1E–06	7.0E–06	1.0E–05	1.2E–09	7.9	0.47	1.60	1,275.5	9.97
143.00	163.00	3.16E–07	3.31E–07	2	WBS22	3.3E–07	#NV	6.6E–07	1.4E–07	1.4E–07	8.0E–08	4.0E–07	9.5E–11	1.1	6.49	27.49	1,443.8	8.03
163.00	183.00	2.03E–06	2.13E–06	2	WBS2	6.5E–06	#NV	7.2E–06	#NV	6.5E–06	4.0E–06	1.0E–05	6.7E–10	10.9	0.49	16.72	1,650.5	10.02
183.00	203.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
203.00	223.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
223.00	243.00	#NV	#NV	#NV	2	#NV	#NV	3.3E–10	#NV	3.3E–10	1.0E–10	6.0E–10	5.8E–11	0.1	1.13	22.45	#NV	#NV
243.00	263.00	3.07E–08	3.21E–08	2	WBS22	6.1E–08	#NV	3.7E–08	1.4E–07	3.7E–08	8.0E–09	8.0E–08	5.9E–11	4.8	#NV	#NV	2,401.2	10.42
263.00	283.00	8.05E–06	8.42E–06	2	WBS2	2.4E–05	#NV	3.6E–05	#NV	3.6E–05	9.0E–06	6.0E–05	3.2E–09	19.0	0.55	5.08	2,589.2	10.58
283.00	303.00	#NV	#NV	#NV	2	#NV	#NV	2.2E–11	#NV	2.2E–11	9.0E–12	6.0E–11	5.6E–11	–0.7	#NV	#NV	#NV	#NV
303.00	323.00	2.85E–06	2.98E–06	2	WBS22	6.4E–06	#NV	1.1E–05	5.8E–06	5.8E–06	3.0E–06	9.0E–06	4.8E–10	14.1	0.31	7.93	2,958.2	10.24
323.00	343.00	1.50E–10	1.57E–10	2	WBS2	9.2E–11	#NV	5.5E–11	#NV	5.5E–11	2.0E–11	9.0E–11	1.2E–11	1.0	#NV	#NV	3,137.1	9.51
343.00	363.00	7.55E–09	7.89E–09	22	WBS22	3.9E–09	1.7E–09	4.3E–09	2.6E–09	4.3E–09	1.0E–09	8.0E–09	2.5E–10	–3.4	#NV	#NV	#NV	#NV
363.00	383.00	#NV	#NV	#NV	2	#NV	#NV	1.1E–11	#NV	1.1E–11	9.0E–12	5.0E–11	3.6E–11	0.0	15.64	60.85	#NV	#NV
383.00	403.00	3.42E–09	3.58E–09	2	WBS2	2.8E–09	#NV	3.3E–09	#NV	3.3E–09	9.0E–10	5.0E–09	6.1E–11	2.5	#NV	#NV	3,699.9	10.04
403.00	423.00	#NV	#NV	#NV	2	#NV	#NV	2.9E–11	#NV	2.9E–11	9.0E–12	8.0E–11	6.8E–11	–1.0	#NV	#NV	#NV	#NV
423.00	443.00	4.86E–08	5.08E–08	2	WBS2	4.2E–08	#NV	2.0E–07	#NV	2.0E–07	8.0E–08	6.0E–07	4.6E–11	21.1	1.40	6.06	4,086.5	11.59
443.00	463.00	2.01E–08	2.10E–08	2	WBS2	3.1E–08	#NV	1.2E–07	#NV	3.1E–08	9.0E–09	6.0E–08	5.0E–11	5.0	0.38	17.02	4,269.7	11.35
463.00	483.00	#NV	#NV	#NV	2	#NV	#NV	5.7E–11	#NV	5.7E–11	2.0E–11	9.0E–11	6.3E–11	–0.3	9.04	32.95	#NV	#NV
483.00	503.00	4.58E–09	4.79E–09	2	WBS22	4.3E–09	#NV	2.5E–09	4.1E–08	2.5E–09	9.0E–10	5.0E–09	6.0E–11	0.2	#NV	#NV	4,645.5	11.84

Interval position		Stationary flow parameters		Transient analysis														
				Flow regime		Formation parameters											Static conditions	
up m btoc	low m btoc	Q/s m^2/s	TM m^2/s	Perturb. Phase	Recovery Phase	T_{f1} m^2/s	T_{f2} m^2/s	T_{s1} m^2/s	T_{s2} m^2/s	T_T m^2/s	T_{TMIN} m^2/s	T_{TMAX} m^2/s	C m^3/Pa	ξ –	dt_1 min	dt_2 min	p* kPa	h_{wif} m.a.s.l.
503.00	523.00	2.86E–06	2.99E–06	2	WBS2	6.0E–06	#NV	4.1E–06	#NV	4.1E–06	1.0E–06	7.0E–06	1.2E–09	1.0	0.92	14.08	4,830.4	11.80
523.00	543.00	6.41E–08	6.71E–08	2	WBS2	9.6E–08	#NV	2.2E–07	#NV	2.2E–07	8.0E–08	6.0E–07	8.5E–11	15.0	2.05	14.05	5,023.2	12.57
543.00	563.00	#NV	#NV	#NV	22	#NV	#NV	1.2E–12	3.0E–13	1.2E–12	7.0E–13	4.0E–12	1.1E–11	–0.4	#NV	#NV	#NV	#NV
563.00	583.00	7.27E–06	7.60E–06	2	WBS2	2.0E–05	#NV	2.7E–05	#NV	2.7E–05	9.0E–06	5.0E–05	1.6E–09	13.5	0.45	17.96	5,392.3	12.47
583.00	603.00	2.11E–07	2.21E–07	22	WBS22	5.4E–07	1.9E–07	7.9E–07	2.5E–07	7.9E–07	5.0E–07	1.0E–06	1.6E–10	14.7	#NV	#NV	5,581.5	12.91
603.00	623.00	#NV	#NV	#NV	2	#NV	#NV	4.4E–11	#NV	4.4E–11	1.0E–11	9.0E–11	5.5E–11	–0.7	2.90	35.22	#NV	#NV
623.00	643.00	#NV	#NV	#NV	2	#NV	#NV	1.3E–11	1.8E–12	1.3E–11	9.0E–12	4.0E–11	6.0E–11	–1.5	#NV	#NV	#NV	#NV
643.00	663.00	#NV	#NV	#NV	2	#NV	#NV	2.1E–12	#NV	2.1E–12	9.0E–13	6.0E–12	3.1E–11	–1.0	#NV	#NV	#NV	#NV
663.00	683.00	6.39E–10	6.68E–10	22	WBS2	6.5E–10	2.0E–10	6.3E–11	#NV	2.0E–10	9.0E–11	7.0E–10	4.6E–11	–1.6	2.68	15.04	6,317.5	12.80
683.00	703.00	#NV	#NV	#NV	22	#NV	#NV	2.6E–10	1.5E–10	1.5E–10	6.0E–11	3.0E–10	5.3E–11	–0.1	#NV	#NV	#NV	#NV
703.00	723.00	2.34E–09	2.44E–09	2	WBS2	1.85E–10	#NV	2.6E–10	#NV	2.6E–10	8.0E–11	6.0E–10	1.4E–10	–3.1	#NV	#NV	#NV	#NV
723.00	743.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
743.00	763.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
763.00	783.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
783.00	803.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
803.00	823.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
823.00	843.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
843.00	863.00	2.73E–09	2.85E–09	2	WBS2	8.5E–10	#NV	8.2E–10	#NV	8.2E–10	5.0E–10	1.0E–09	8.8E–11	–2.3	#NV	#NV	#NV	#NV
863.00	883.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
303.00	308.00	5.16E–07	4.26E–07	2	WBS2	6.00E–07	#NV	2.4E–06	#NV	6.0E–07	2.0E–07	9.0E–07	3.62E–11	0.3	0.50	17.83	2,822.7	10.66
308.00	313.00	2.62E–06	2.16E–06	2	WBS22	6.96E–06	#NV	1.3E–05	6.46E–06	6.5E–06	2.0E–06	9.0E–06	3.46E–10	20.1	3.33	12.15	2,867.5	10.5
313.00	318.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
318.00	323.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
343.00	348.00	7.79E–09	6.43E–09	22	WBS22	6.32E–09	2.2E–09	3.6E–09	2.08E–09	3.6E–09	1.0E–09	8.0E–09	1.29E–10	–3.6	#NV	#NV	#NV	#NV
348.00	353.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
353.00	358.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
358.00	363.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
383.00	388.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
388.00	393.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
393.00	398.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV

Interval position		Stationary flow parameters		Transient analysis														
				Flow regime		Formation parameters											Static conditions	
up m btoc	low m btoc	Q/s m^2/s	TM m^2/s	Perturb. Phase	Recovery Phase	T_{f1} m^2/s	T_{f2} m^2/s	T_{s1} m^2/s	T_{s2} m^2/s	T_T m^2/s	T_{TMIN} m^2/s	T_{TMAX} m^2/s	C m^3/Pa	ξ –	dt_1 min	dt_2 min	p* kPa	h_{wif} m.a.s.l.
398.00	403.00	3.49E–09	2.88E–09	2	WBS22	3.3E–09	#NV	3.0E–09	2.0E–08	3.0E–09	9.0E–10	6.0E–09	2.0E–11	3.1	#NV	#NV	3,712.4	11.32
423.00	428.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
428.00	433.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
433.00	438.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
438.00	443.00	5.69E–08	4.70E–08	2	WBS2	1.4E–07	#NV	1.9E–07	#NV	1.9E–07	9.0E–08	5.0E–07	2.4E–11	15.7	0.88	7.93	4,087.3	11.68
442.00	447.00	#NV	#NV	#NV	22	#NV	#NV	1.2E–10	3.2E–10	1.2E–10	8.0E–11	3.0E–10	3.8E–11	0.2	0.95	5.33	#NV	#NV
447.00	452.00	8.78E–09	1.06E–08	2	WBS2	1.4E–08	#NV	6.3E–08	#NV	1.4E–08	8.0E–09	3.0E–08	1.3E–11	3.5	1.95	13.05	4,174.5	12.05
452.00	457.00	1.34E–08	1.10E–08	2	WBS2	2.2E–08	#NV	8.2E–08	#NV	2.2E–08	8.0E–09	4.0E–08	1.1E–11	5.4	2.28	15.33	4,220.6	12.02
457.00	462.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
462.00	467.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
483.00	488.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
488.00	493.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
493.00	498.00	#NV	#NV	#NV	2	#NV	#NV	2.6E–10	#NV	2.6E–10	9.0E–11	4.0E–10	1.2E–11	1.0	0.47	23.02	#NV	#NV
498.00	503.00	3.90E–10	2.80E–09	2	WBS22	3.8E–09	#NV	2.5E–09	1.8E–08	2.5E–09	8.0E–10	5.0E–09	2.2E–11	1.6	#NV	#NV	4,650.5	12.35
503.00	508.00	1.53E–08	1.26E–08	2	WBS2	1.4E–08	#NV	1.1E–08	#NV	1.1E–08	7.0E–09	5.0E–08	7.7E–10	1.2	#NV	#NV	4,687.3	11.38
508.00	513.00	1.31E–08	1.09E–08	2	WBS22	7.1E–09	#NV	1.3E–08	6.3E–09	1.3E–08	7.0E–09	3.0E–08	1.8E–11	–0.3	0.70	2.08	4,738.0	11.83
513.00	518.00	9.44E–07	7.79E–07	2	WBS2	1.5E–06	#NV	4.0E–06	#NV	4.0E–06	2.0E–06	6.0E–06	4.9E–10	19.9	1.15	8.73	4,794.0	12.81
518.00	523.00	2.51E–06	2.07E–06	2	WBS2	5.4E–06	#NV	4.7E–06	#NV	4.7E–06	2.0E–06	7.0E–06	1.2E–09	3.3	1.04	9.11	4,837.1	12.49
523.00	528.00	7.00E–09	5.77E–09	2	WBS2	9.1E–09	#NV	4.2E–08	#NV	4.2E–08	1.0E–08	7.0E–08	4.6E–11	32.6	#NV	#NV	4,881.0	12.24
528.00	533.00	3.84E–08	3.17E–08	2	WBS22	6.7E–08	#NV	6.8E–08	6.8E–07	6.7E–08	3.0E–08	9.0E–08	2.3E–11	5.0	1.09	11.33	4,932.1	12.73
533.00	538.00	8.22E–08	6.78E–08	2	WBS2	1.7E–07	#NV	3.7E–07	#NV	3.7E–07	9.0E–08	6.0E–07	3.0E–11	21.3	#NV	#NV	4,980.7	12.96
538.00	543.00	1.35E–09	1.12E–09	2	WBS2	1.1E–09	#NV	4.1E–09	#NV	4.1E–09	1.0E–09	1.0E–08	1.9E–11	10.0	#NV	#NV	5,028.7	13.13
563.00	568.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
568.00	573.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
573.00	578.00	3.36E–06	2.77E–06	2	WBS2	9.7E–06	#NV	1.5E–05	#NV	1.5E–05	8.0E–06	3.0E–05	7.7E–10	19.7	0.53	8.47	5,350.3	12.90
578.00	583.00	4.56E–06	3.76E–06	2	WBS2	1.0E–05	#NV	2.1E–05	#NV	1.0E–05	8.0E–06	3.0E–05	1.4E–09	5.6	0.88	15.88	5,397.7	13.02
583.00	588.00	#NV	#NV	#NV	2	#NV	#NV	1.2E–11	#NV	1.2E–11	9.0E–12	4.0E–11	1.2E–11	–0.7	#NV	#NV	#NV	#NV
588.00	593.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
593.00	598.00	#NV	#NV	#NV	2	#NV	#NV	4.2E–12	#NV	4.2E–12	1.0E–12	7.0E–12	1.9E–11	0.0	#NV	#NV	#NV	#NV
598.00	603.00	2.20E–07	1.82E–07	22	WBS22	3.8E–07	1.9E–07	8.7E–07	2.9E–07	3.8E–07	9.0E–08	9.0E–07	1.2E–10	3.9	0.83	4.65	5,583.6	13.12

Interval position		Stationary flow parameters		Transient analysis													Static conditions	
				Flow regime		Formation parameters												
up m btoc	low m btoc	Q/s m^2/s	TM m^2/s	Perturb. Phase	Recovery Phase	T_{f1} m^2/s	T_{f2} m^2/s	T_{s1} m^2/s	T_{s2} m^2/s	T_T m^2/s	T_{TMIN} m^2/s	T_{TMAX} m^2/s	C m^3/Pa	ξ –	dt_1 min	dt_2 min	p* kPa	h_{wif} m.a.s.l.
663.00	668.00	7.05E–10	5.82E–10	22	WBS22	1.0E–10	3.9E–11	1.3E–10	5.4E–11	1.3E–10	8.0E–11	4.0E–10	3.9E–11	–2.8	#NV	#NV	#NV	#NV
668.00	673.00	#NV	#NV	#NV	2	#NV	#NV	1.2E–11	#NV	1.2E–11	9.0E–12	4.0E–11	1.7E–11	0.3	6.71	42.07	#NV	#NV
673.00	678.00	#NV	#NV	#NV	2	#NV	#NV	9.0E–11	1.1E–10	9.0E–11	5.0E–11	2.0E–10	1.2E–11	0.1	2.36	8.90	#NV	#NV
678.00	683.00	#NV	#NV	#NV	2	#NV	#NV	8.4E–11	#NV	8.4E–11	6.0E–11	1.0E–10	1.5E–11	–0.3	1.95	16.97	#NV	#NV

Notes

1 T1 and T2 refer to the transmissivity(s) derived from the analysis while using the recommended flow model. In case a homogeneous flow model was recommended only one T value is reported, in case a two zones composite model was recommended both T1 and T2 are given. T_T denotes the recommended transmissivity.

2 The parameter p* denoted the static formation pressure (measured at transducer depth) and was derived from the HORNER plot of the CHIR phase using straight line or type-curve extrapolation.

3 The flow regime description refers to the recommended model used in the transient analysis. WBS denotes wellbore storage and skin and is followed by a set of numbers describing the flow dimension used in the analysis (1 = linear flow, 2 = radial flow, 3 = spherical flow). If only one number is used (e.g. WBS2 or 2) a homogeneous flow model (1 composite zone) was used in the analysis, if two numbers are given (WBS22 or 22) a 2 zones composite model was used.

Table 7-3. Results from generalized radial flow analysis of constant head tests in KLX11A (for nomenclature see Appendix 4).

Interval position		Stationary flow parameters		Transient analysis Flow regime				Formation parameters				
up	low	Q/s	TM	Perturb. Phase		Recovery Phase		T_f	T_s	T_T	C	ξ
m btoc	m btoc	m²/s	m²/s	n_1	n_2	n_1	n_2	m²/s	m²/s	m²/s	m³/Pa	–
103.00	203.00	6.51E–06	8.47E–06	2.1	#NV	WBS2.1	#NV	6.2E–06	7.4E–06	6.2E–06	3.2E–09	2.3
203.00	303.00	7.48E–06	9.74E–06	2.1	#NV	WBS 2.1	#NV	8.7E–06	8.1E–06	8.1E–06	2.0E–09	5.8
303.00	403.00	2.85E–06	3.71E–06	2.2	#NV	#NV	#NV	1.5E–06	#NV	1.5E–06	4.4E–10	0.0
403.00	503.00	5.61E–08	7.31E–08	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
503.00	603.00	8.72E–06	1.14E–05	2.1	#NV	WBS 2.1	#NV	7.7E–06	9.0E–06	9.0E–06	3.6E–09	2.2
603.00	703.00	1.60E–09	2.08E–09	1.58	#NV	#NV	#NV	1.6E–09	#NV	1.6E–09	1.9E–10	–1.7
703.00	803.00	1.61E–09	2.10E–09	1.5	#NV	#NV	#NV	6.0E–10	#NV	6.0E–10	2.4E–10	–3.2
803.00	903.00	3.62E–09	2.78E–09	1.7	#NV	#NV	#NV	1.8E–09	#NV	1.8E–09	3.1E–10	–2.1
876.00	976.00	#NV	#NV	#NV	#NV	WBS 1.33	#NV	#NV	6.2E–10	6.2E–10	2.6E–10	–0.6
103.00	123.00	1.14E–06	1.20E–06	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
123.00	143.00	3.19E–06	3.34E–06	2.3	2.38	WBS 2.3	WBS 2.4	1.2E–06	1.2E–06	1.2E–06	1.1E–09	0.0
143.00	163.00	3.16E–07	3.31E–07	2.3	#NV	#NV	#NV	6.7E–08	#NV	6.7E–08	9.5E–11	–3.5
163.00	183.00	2.03E–06	2.13E–06	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
183.00	203.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
203.00	223.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
223.00	243.00	#NV	#NV	#NV	#NV	1.79	#NV	#NV	8.5E–10	8.5E–10	5.8E–11	0.8
243.00	263.00	3.07E–08	3.21E–08	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
263.00	283.00	8.05E–06	8.42E–06	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
283.00	303.00	#NV	#NV	#NV	#NV	1.49	#NV	#NV	1.0E–10	1.0E–10	5.6E–11	–4.9
303.00	323.00	2.85E–06	2.98E–06	2.3	#NV	#NV	#NV	9.7E–07	#NV	9.7E–07	4.8E–10	–1.8
323.00	343.00	1.50E–10	1.57E–10	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
343.00	363.00	7.55E–09	7.89E–09	2	1.6	WBS 2	WBS 1.6	4.0E–09	4.3E–09	4.3E–09	2.5E–10	–3.4
363.00	383.00	#NV	#NV	#NV	#NV	1.75	#NV	#NV	3.2E–11	3.2E–11	3.6E–11	0.7
383.00	403.00	3.42E–09	3.58E–09	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
403.00	423.00	#NV	#NV	#NV	#NV	1.45	#NV	#NV	1.8E–10	1.8E–10	6.8E–11	0.6
423.00	443.00	4.86E–08	5.08E–08	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
443.00	463.00	2.01E–08	2.10E–08	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
463.00	483.00	#NV	#NV	#NV	#NV	1.7	#NV	#NV	1.6E–10	1.6E–10	6.25E–11	0.0
483.00	503.00	4.58E–09	4.79E–09	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
503.00	523.00	2.86E–06	2.99E–06	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
523.00	543.00	6.41E–08	6.71E–08	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
543.00	563.00	#NV	#NV	#NV	#NV	1	#NV	#NV	1.7E–11	1.7E–11	1.1E–11	0.1
563.00	583.00	7.27E–06	7.60E–06	2.1	#NV	WBS 2.1	#NV	7.0E–06	8.2E–06	8.2E–06	2.0E–09	5.8
583.00	603.00	2.11E–07	2.21E–07	2	1.9	WBS 2	WBS 1.95	5.4E–07	7.9E–07	7.9E–07	1.6E–10	14.7
603.00	623.00	#NV	#NV	#NV	#NV	1.5	#NV	#NV	1.1E–09	1.1E–09	5.5E–11	1.9
623.00	643.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
643.00	663.00	#NV	#NV	#NV	#NV	1.6	#NV	#NV	5.3E–12	5.3E–12	3.1E–11	–0.9
663.00	683.00	6.39E–10	6.68E–10	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
683.00	703.00	#NV	#NV	#NV	#NV	2	1.87	#NV	2.6E–10	2.6E–10	5.3E–11	–1.3
703.00	723.00	2.34E–09	2.44E–09	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
723.00	743.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
743.00	763.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
763.00	783.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
783.00	803.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
803.00	823.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
823.00	843.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
843.00	863.00	2.73E–09	2.85E–09	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
863.00	883.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
303.00	308.00	5.16E–07	4.26E–07	1.9	#NV	#NV	#NV	1.47E–06	#NV	1.47E–06	3.62E–11	2.3
308.00	313.00	2.62E–06	2.16E–06	2.2	#NV	#NV	#NV	1.49E–06	#NV	1.49E–06	3.46E–10	0.9

Interval position		Stationary flow parameters		Transient analysis Flow regime				Formation parameters				
up	low	Q/s	TM	Perturb. Phase		Recovery Phase		T_f	T_s	T_T	C	ξ
m btoc	m btoc	m²/s	m²/s	n_1	n_2	n_1	n_2	m²/s	m²/s	m²/s	m³/Pa	–
313.00	318.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
318.00	323.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
343.00	348.00	7.79E–09	6.43E–09	2	1.68	WBS 2	WBS 1.76	6.30E–09	3.6E–09	3.6E–09	1.29E–10	–3.6
348.00	353.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
353.00	358.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
358.00	363.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
383.00	388.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
388.00	393.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
393.00	398.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
398.00	403.00	3.49E–09	2.88E–09	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
423.00	428.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
428.00	433.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
433.00	438.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
438.00	443.00	5.69E–08	4.70E–08	2.2	#NV	#NV	#NV	2.8E–08	#NV	2.8E–08	2.4E–11	1.59
442.00	447.00	#NV	#NV	#NV	#NV	2	2.23	#NV	1.2E–10	1.2E–10	3.8E–11	0.2
447.00	452.00	8.78E–09	1.06E–08	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
452.00	457.00	1.34E–08	1.10E–08	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
457.00	462.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
462.00	467.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
483.00	488.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
488.00	493.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
493.00	498.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
498.00	503.00	3.90E–10	2.80E–09	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
503.00	508.00	1.53E–08	1.26E–08	2.1	#NV	#NV	#NV	7.9E–09	#NV	7.9E–09	7.7E–10	0.1
508.00	513.00	1.31E–08	1.09E–08	1.9	#NV	WBS 2	WBS 1.86	1.2E–08	1.3E–08	1.3E–08	1.8E–11	–0.3
513.00	518.00	9.44E–07	7.79E–07	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
518.00	523.00	2.51E–06	2.07E–06	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
523.00	528.00	7.00E–09	5.77E–09	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
528.00	533.00	3.84E–08	3.17E–08	#NV	#NV	3	#NV	#NV	3.14E–09	3.14E–09	9.5E–12	0.816
533.00	538.00	8.22E–08	6.78E–08	2.3	#NV	#NV	#NV	2.8E–08	#NV	2.8E–08	#NV	0.454
538.00	543.00	1.35E–09	1.12E–09	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
563.00	568.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
568.00	573.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
573.00	578.00	3.36E–06	2.77E–06	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
578.00	583.00	4.56E–06	3.76E–06	2.1	#NV	#NV	#NV	4.2E–06	#NV	4.15E–06	#NV	1.415
583.00	588.00	#NV	#NV	#NV	#NV	1.4	#NV	#NV	2.55E–10	2.6E–10	2.6E–10	0.633
588.00	593.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
593.00	598.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
598.00	603.00	2.20E–07	1.82E–07	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
663.00	668.00	7.05E–10	5.82E–10	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
668.00	673.00	#NV	#NV	#NV	#NV	1.6	#NV	#NV	5.67E–11	5.7E–11	1.7E–11	0.9
673.00	678.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV
678.00	683.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV

Notes

1 n1 and n2 refer to the transmissivity(s) derived from the analysis while using the recommended flow model. In case a homogeneous flow model was recommended only one n value is reported, in case a two zones composite model was recommended both n1 and n2 are given.

2 The flow regime description refers to the genaralized radial flow analysis. WBS denotes wellbore storage and skin and is followed by a set of numbers describing the flow dimension used in the analysis (1 = linear flow, 2 = radial flow, 3 = spherical flow). If only a n1 value is used a homogeneous flow model was used in the analysis, if a value is given for n1 and n2 two shell composite model was used.

The Figures 7-1 to 7-3 present the transmissivity, conductivity and hydraulic freshwater head profiles.

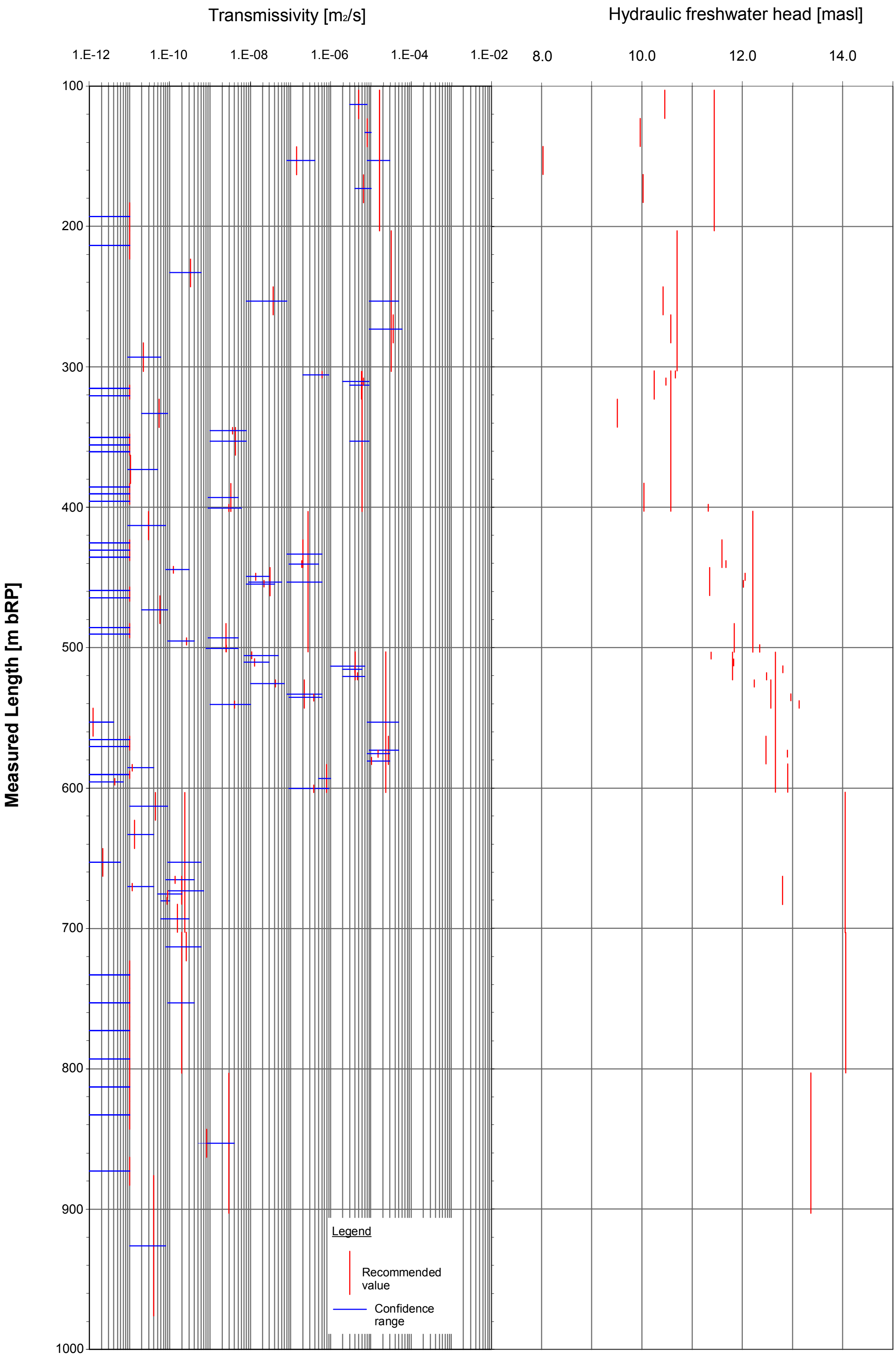


Figure 7-1. Results summary – profiles of transmissivity and equivalent freshwater head, transmissivities derived from injectiontests, freshwater head extrapolated.

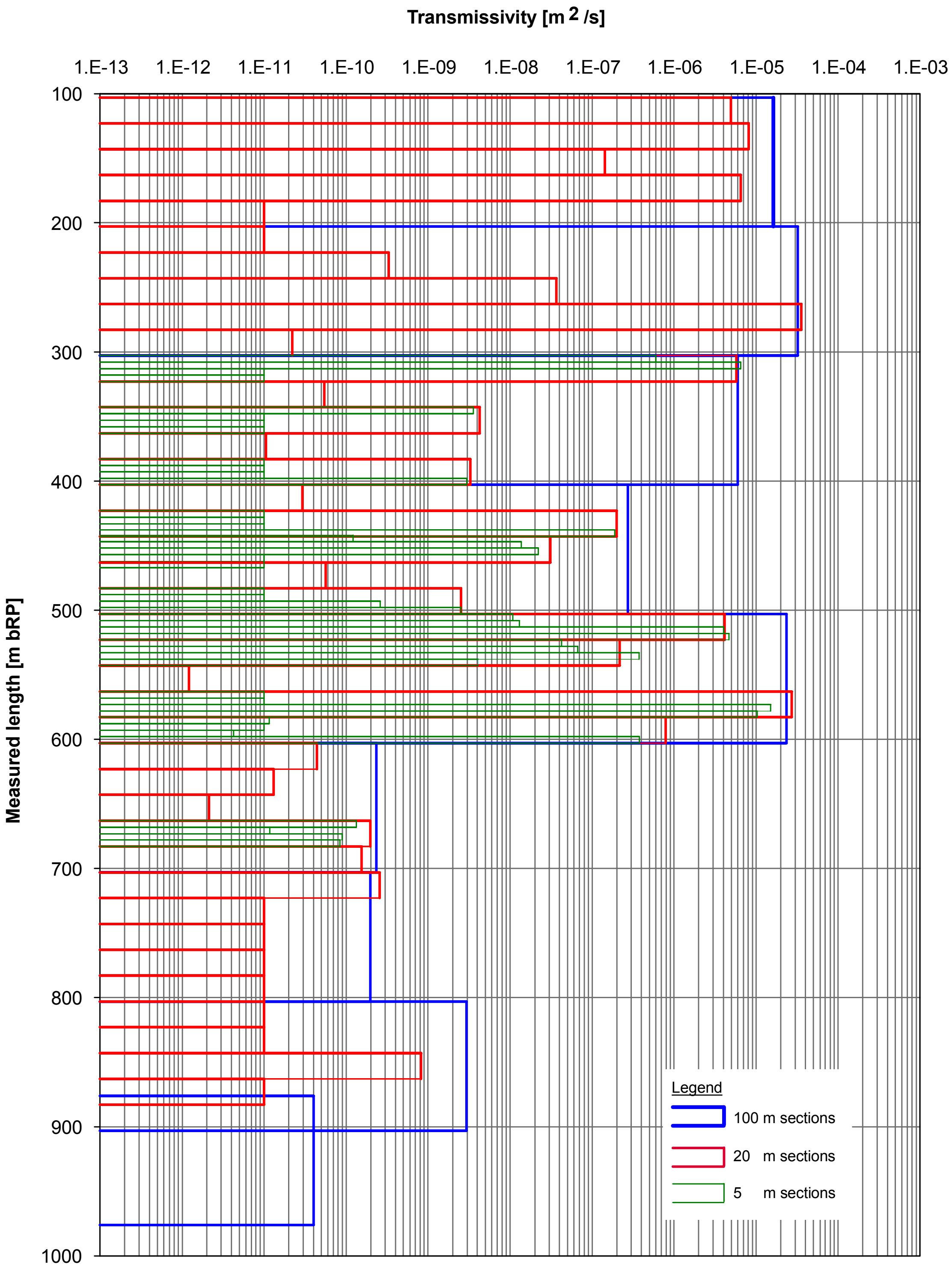


***Figure 7-2.** Results summary – profile of transmissivity.*

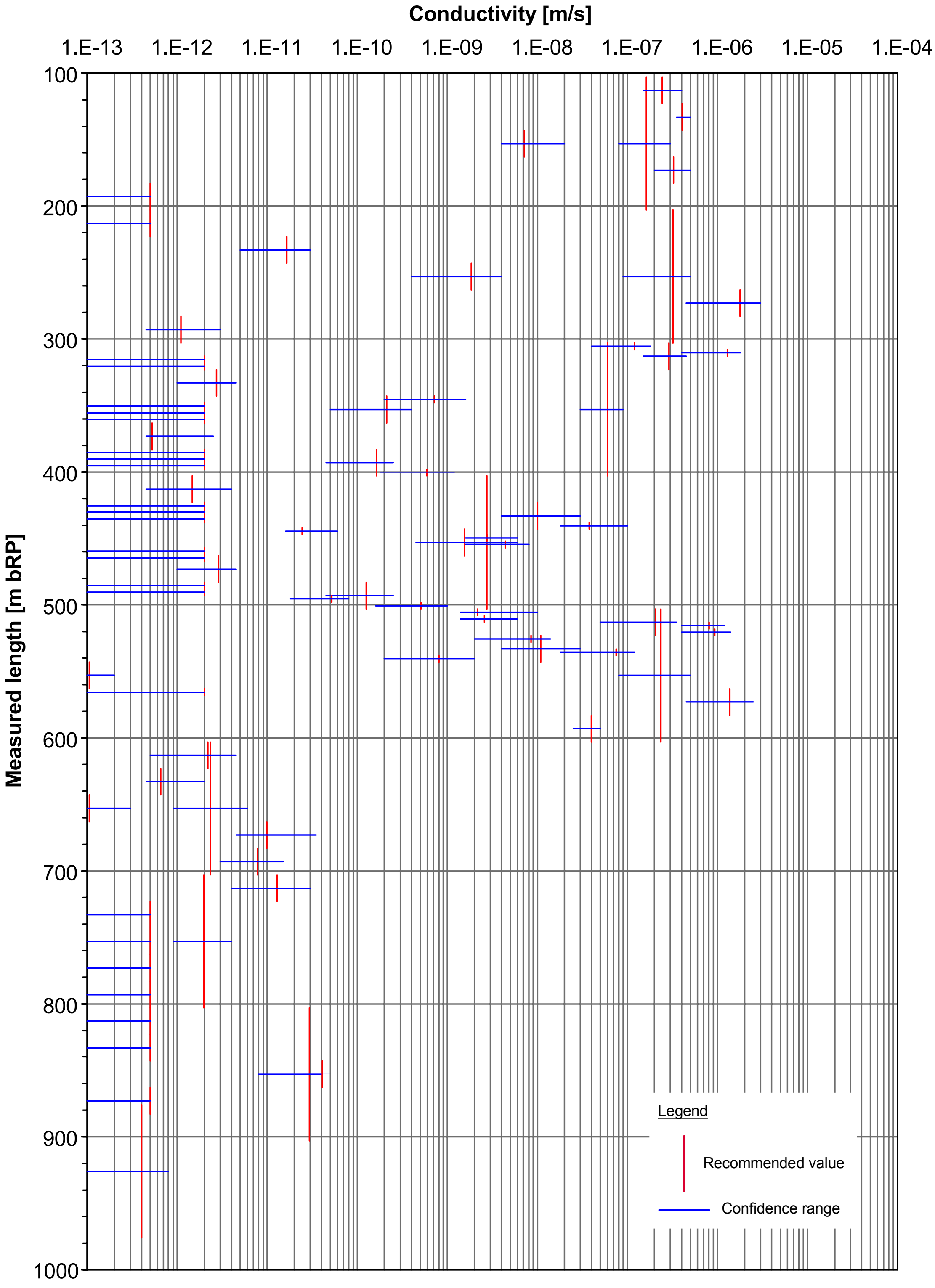


Figure 7-3. Results summary – profile of hydraulic conductivity.

7.2 Correlation analysis

A correlation analysis was used with the aim of examining the consistency of results and deriving general conclusion regarding the testing and analysis methods used.

7.2.1 Comparison of steady state and transient analysis results

The steady state derived transmissivities (T_M and Q/s) were compared in a cross-plot with the recommended transmissivity values derived from the transient analysis (see Figure 7-4).

The correlation analysis shows that the steady state derived transmissivities differ by less than one order of magnitude from the transmissivities derived from the transient analysis.

7.2.2 Comparison between the matched and theoretical wellbore storage coefficient

The wellbore storage coefficient describes the capacity of the test interval to store fluid as result to an unit pressure change in the interval. For a closed system (i.e. closed downhole valve) the theoretical value of the wellbore storage coefficient is given by the product between the interval volume and the test zone compressibility. The interval volume is calculated from the borehole radius and interval length. There are uncertainties concerning the interval volume calculation. Cavities or high transmissivity fractures intersecting the interval may enlarge the effective volume of the interval. The test zone compressibility is given by the sum of compressibilities of the individual components present in the interval (water, packer elements, other test tool components, and the borehole wall). A minimum value for the test zone compressibility is given by the water compressibility which is approx. $5 \cdot 10^{-10}$ 1/Pa. For the calculation of the theoretical wellbore storage coefficient a test zone compressibility of $7 \cdot 10^{-10}$ 1/Pa was used. The matched wellbore storage coefficient is derived from the transient type curve analysis by matching the unit slope early times derivative plotted in log-log coordinates.

Figure 7-5 presents a cross-plot of the matched and theoretical wellbore storage coefficients.

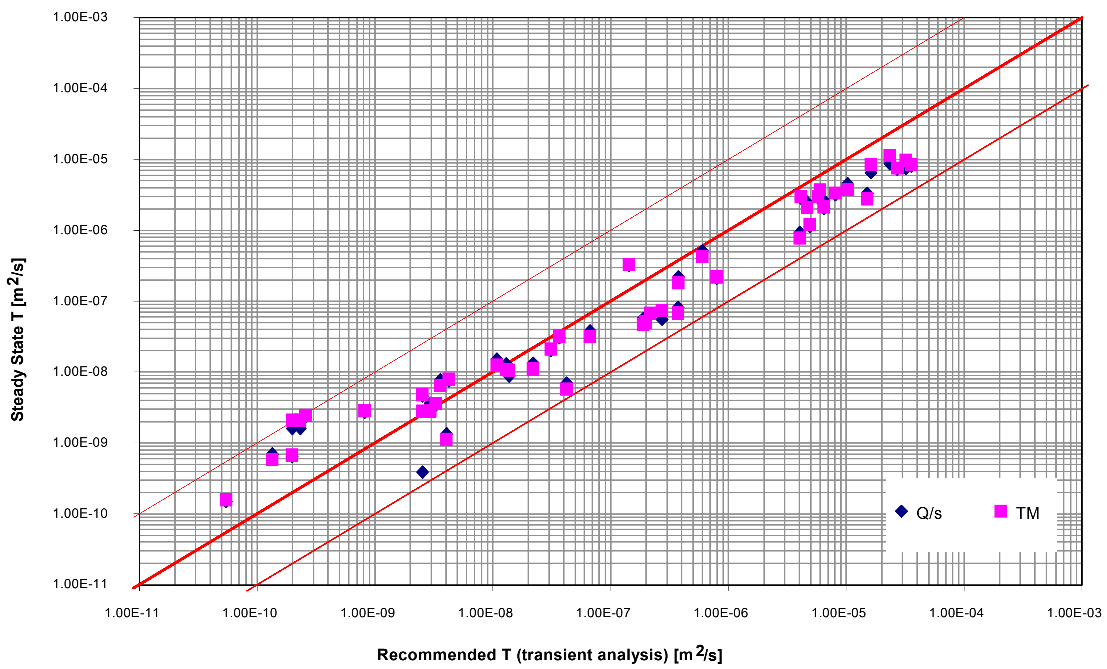


Figure 7-4. *Correlation analysis of transmissivities derived by steady state and transient methods.*

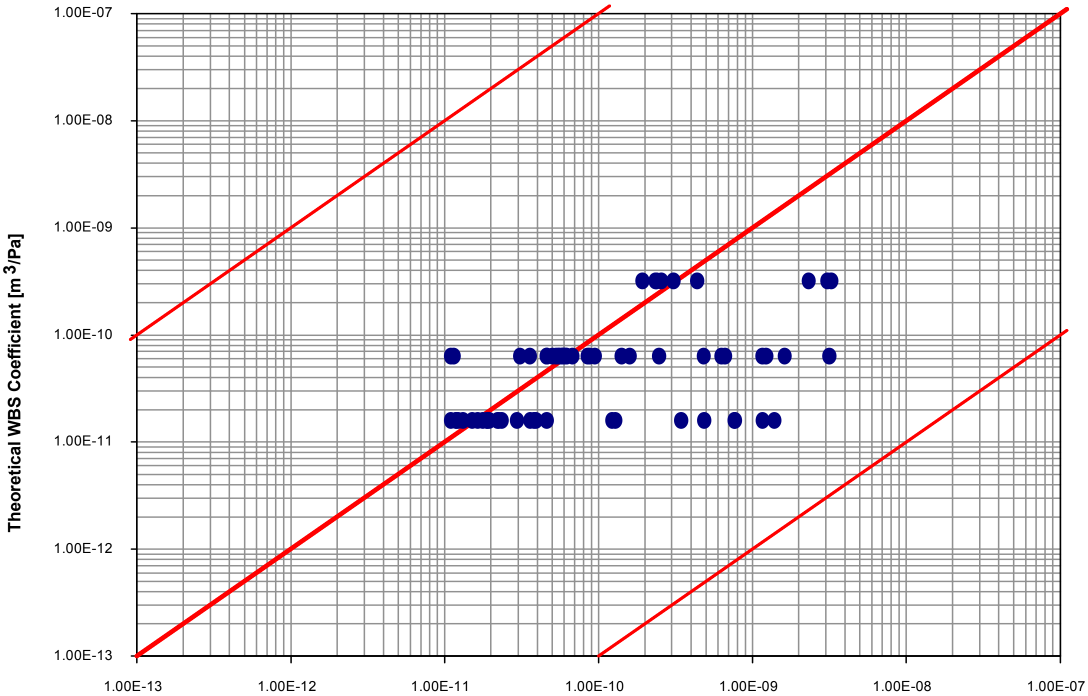


Figure 7-5. *Correlation analysis of theoretical and matched wellbore storage coefficients.*

It can be seen that the matched wellbore storage coefficients are up to one orders of magnitude larger than the theoretical values for the 100 m Tests and up to two orders of magnitude larger for the 20 m and 5 m tests. This phenomenon was already observed at the previous boreholes. A two orders of magnitude increase is difficult to explain by volume uncertainty. Even if large fractures are connected to the interval, a volume increase by two orders of magnitude does not seem probable. The discrepancy can be more likely explained by increased compressibility of the packer system. In order to better understand this phenomenon, a series of tool compressibility tests should be conducted in order to measure the tool compressibility and to assess to what extent the system behaves elastically.

8 Conclusions

8.1 Transmissivity

Figure 7-1 presents a profile of transmissivity, including the confidence ranges derived from the transient analysis. The method used for deriving the recommended transmissivity and its confidence range is described in Section 5.5.7.

Whenever possible, the transmissivities derived are representative for the "undisturbed formation" further away from the borehole. The borehole vicinity was typically described by using a skin effect.

In few cases the tests were not analysable because the compliance phase following the packer inflation was to long or because the conducted preliminary pulse did not recover. Both responses are indicative for a very low interval transmissivity and a transmissivity value of $1 \cdot 10^{-11}$ m²/s was recommended (regarded as the upper limit of the confidence range).

If the conducted preliminary pulse injection (PI) showed a slow recovery the pulse test was prolonged and no further injection test was performed. The pulse test was used for a quantitative analysis. The recommended transmissivities of the pulse tests range between $1.2 \cdot 10^{-12}$ m²/s and $3.3 \cdot 10^{-10}$ m²/s.

The recommended transmissivities derived from the conducted injection tests (CHi and CHir) range between $2.0 \cdot 10^{-10}$ m²/s and $2.7 \cdot 10^{-5}$ m²/s.

The transmissivity profiles in Figures 7-1 and 7-2 show two distinct zones. The first zone between 100 m and 600 m shows all in all a relatively high and medium transmissisivity (except some sections with a transmissivity below $3 \cdot 10^{-9}$ m²/s). The average transmissivity in this zone is $2.9 \cdot 10^{-6}$ m²/s. The second zone between 600 m and 980 m shows relatively low transmissivities and the average transmissivity is $2.5 \cdot 10^{-10}$ m²/s.

A few 20 m and 5 m sections show larger transmissivities than the appropriate longer interval. The differences are relatively small and are covered by the confidence range.

8.2 Equivalent freshwater head

Figure 7-1 presents a profile of the derived equivalent freshwater head expressed in meters above sea level. The method used for deriving the equivalent freshwater head is described in Section 5.5.6.

The head profile shows a freshwater head that is slightly increasing with depth. The freshwater head ranges from 8.0 m to 14.1 m. This increase can be explained by higher salinity of the water down in the borehole.

The uncertainty related to the derived freshwater heads is dependent on the test section transmissivity. Due to the relatively short pressure recovery phase, the static pressure extrapolation becomes increasingly uncertain at lower transmissivities.

8.3 Generalized radial flow analysis

In addition to the radial flow analysis a generalized radial flow analysis was performed. The generalized radial flow analysis is based on the flow model developed by /Barker 1988/ and allows the modelling of flow dimensions between 1 (linear flow) and 3 (spherical flow). Figure 8-1 presents the statistical distribution of the derived flow dimension with respect to the interval length.

The statistical distribution chart contains only the tests that were analysable with the GRF and tests with clear radial flow (n = 2). Tests with insuffficent data quality e.g. noise or no clear flow stabilization were not counted in the chart. No value (e.g. below measurement limit) tests are also not included in the statistic. The basis for the chart is,

- 100 m section: 8 number of tests "with a flow dimension".
- 20 m section: 18 number of tests "with a flow dimension".
- 5 m section: 20 number of tests "with a flow dimension".

This totals 46 tests out of 93 tests have a value.

The figure shows that the most of the generalized radial flow analyses result in a flow dimension below n = 2. This behaviour indicates that sub-cylindrical flow prevails.

The general expectation is that the length of the test section would influence the derived flow dimension in the sense that a longer test interval would rather tend to display cylindrical flow geometry when compared with a shorter test section. Due to the fact that a shorter test section (e.g. 5 m) would act more like a selective source than a longer interval (e.g. 100 m) the assumption is that a short interval would rather show linear flow (only one fracture influences the response) or by spherical flow (due to the short length of the test section the occurrence of vertical flow components becomes more probable). Comparing this hypothesis with the results of the generalized radial flow analysis it can be seen that a clear relationship between interval length and derived flow dimension does not exist. This may be attributed to the relatively small amount of evaluated tests.

In addition, given the data quality (i.e. relatively short duration of the individual test phases) there is considerable uncertainty in the derived flow dimension.

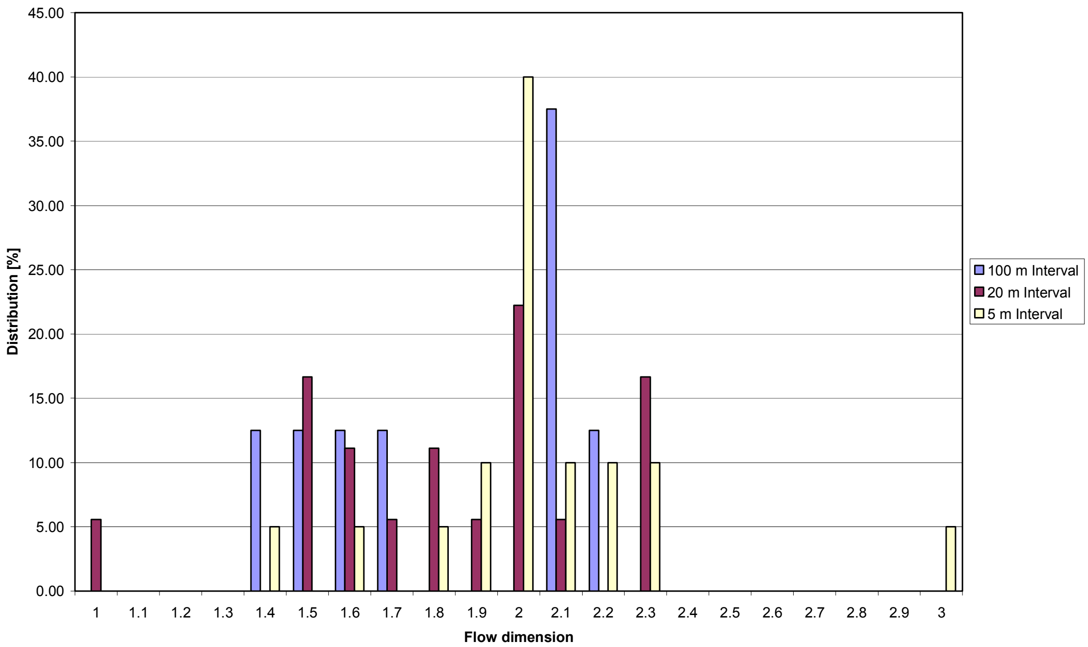


Figure 8-1. *Statistical distribution of the derived flow dimension.*

8.4 Flow regimes encountered

The flow models used in analysis were derived from the shape of the pressure derivative calculated with respect to log time and plotted in log-log coordinates.

In several cases the pressure derivative suggests a change of transmissivity or a change in flow dimension with the distance from the borehole. In such cases a composite flow model was used in the analysis.

If there were different flow models matching the data in comparable quality, the simplest model was preferred.

In some cases very large skins has been observed. This is unusual and should be further examined. There are several possible explanations to this behaviour:

- If the behaviour is to be completely attributed to changes of transmissivity in the formation, this indicates the presence of larger transmissivity zones in the borehole vicinity, which could be caused by steep fractures that do not intersect the test interval, but are connected to the interval by lower transmissivity fractures. The fact that in many cases the test derivatives of adjacent test sections converge at late times seems to support this hypothesis.
- A further possibility is that the large skins are caused by turbulent flow taking place in the tool or in fractures connected to the test interval. This hypothesis is more difficult to examine. However, considering the fact that some high skins were observed in sections with low transmissivities (which imply low flow rates) seems to speak against this hypothesis.

The flow dimension displayed by the test can be diagnosed from the slope of the pressure derivative. A slope of 0.5 indicates linear flow, a slope of 0 (horizontal derivative) indicates radial flow and a slope of –0.5 indicates spherical flow. The flow dimension diagnosis was commented for each of the tests.

9 References

Barker J A, 1988. A generalized radial flow model for hydraulic tests in fractured rock. Water Resour. Res. 24(10), 1796–1804.

Bourdet D, Ayoub J A, Pirard Y M, 1989. Use of pressure derivative in well-test interpretation. Coc. Of Petroleum Engineers, SPE Formation Evaluation, pp. 293–302.

Chakrabarty C, Enachescu C, 1997. Using the Devolution Approach for Slug Test Analysis: Theory and Application. Ground Water Sept.-Oct. 1997, pp. 797–806

Gringarten A C, 1986. Computer-aided well-test analysis. SPE Paper 14099.

Horne R N, 1990. Modern well test analysis. Petroway, Inc. Palo Alto, Calif.

Horner D R, 1951. Pressure build-up in wells. Third World Pet. Congress, E.J. Brill, Leiden II, pp. 503–521.

Jacob C E, Lohman S W, 1952. Nonsteady flow to a well of constant drawdown in an extensive aquifer. Transactions, American Geophysical Union, Volume 33, No 4, pp. 559–569.

Moye D G, 1967. Diamond drilling for foundation exploration Civil Eng. Trans., Inst. Eng. Australia, Apr. 1967, pp. 95–100.

Peres A M M, Onur M, Reynolds A C, 1989. A new analysis procedure for determining aquifer properties from slug test data. Water Resour. Res. v. 25, no. 7, pp. 1591–1602.

Puigdomenech I, 2001. Hydrochemical stability of groundwaters surrounding a spent nuclear fuel repository in a 100,000 year perspective. SKB TR-01-28, Svensk Kärnbränslehantering AB.

Ramey H J Jr, Agarwal R G, Martin R G I, 1975. Analysis of "Slug Test" or DST flow Period data. J. Can. Pet. Tec. September 1975.

SKB, 2002. Execution programme for the initial site investigations at Simpevarp. SKB P-02-06, Svensk Kärnbränslehantering AB.

SKB, 2006. Programme for further investigations of bedrock, soil, water and environment in Laxemar subarea. Oskarshamn site investigation. SKB R-06-29, Svensk Kärnbränslehantering AB.

APPENDIX 1

File Description Table

APPENDIX 2

Analysis diagrams

APPENDIX 3

Test Summary Sheets

APPENDIX 4

Nomenclature

Character	SICADA designation	Explanation	Dimension	Unit
Variables, constants				
A_w		Horizontal area of water surface in open borehole, not including area of signal cables, etc.	$[L^2]$	m^2
b		Aquifer thickness (Thickness of 2D formation)	[L]	m
B		Width of channel	[L]	m
L		Corrected borehole length	[L]	m
L_0		Uncorrected borehole length	[L]	m
L_p		Point of application for a measuring section based on its centre point or centre of gravity for distribution of transmissivity in the measuring section.	[L]	m
L_w		Test section length.	[L]	m
dL		Step length, Positive Flow Log - overlapping flow logging. (step length, PFL)	[L]	m
r		Radius	[L]	m
r_w		Borehole, well or soil pipe radius in test section.	[L]	m
r_{we}		Effective borehole, well or soil pipe radius in test section. (Consideration taken to skin factor)	[L]	m
r_s		Distance from test section to observation section, the shortest distance.	[L]	m
r_t		Distance from test section to observation section, the **interpreted** shortest distance via conductive structures.	[L]	m
r_D		Dimensionless radius, $r_D=r/r_w$	-	-
z		Level above reference point	[L]	m
z_r		Level for reference point on borehole	[L]	m
z_{wu}		Level for test section (section that is being flowed), upper limitation	[L]	m
z_{wl}		Level for test section (section that is being flowed), lower limitation	[L]	m
z_{ws}		Level for sensor that measures response in test section (section that is flowed)	[L]	m
z_{ou}		Level for observation section, upper limitation	[L]	m
z_{ol}		Level for observation section, lower limitation	[L]	m
z_{os}		Level for sensor that measures response in observation section	[L]	m
E		Evaporation: hydrological budget:	$[L^3/(T\ L^2)]$ $[L^3/T]$	mm/y, mm/d, m^3/s
ET		Evapotranspiration hydrological budget:	$[L^3/(T\ L^2)]$ $[L^3/T]$	mm/y, mm/d, m^3/s
P		Precipitation hydrological budget:	$[L^3/(T\ L^2)]$ $[L^3/T]$	mm/y, mm/d, m^3/s
R		Groundwater recharge hydrological budget:	$[L^3/(T\ L^2)]$ $[L^3/T]$	mm/y, mm/d, m^3/s
D		Groundwater discharge hydrological budget:	$[L^3/(T\ L^2)]$ $[L^3/T]$	mm/y, mm/d, m^3/s
Q_R		Run-off rate	$[L^3/T]$	m^3/s
Q_p		Pumping rate	$[L^3/T]$	m^3/s
Q_I		Infiltration rate	$[L^3/T]$	m^3/s
Q		Volumetric flow. Corrected flow in flow logging ($Q_1 – Q_0$) (Flow rate)	$[L^3/T]$	m^3/s
Q_0		Flow in test section during undisturbed conditions (flow logging).	$[L^3/T]$	m^3/s
Q_p		Flow in test section immediately before stop of flow. Stabilised pump flow in flow logging.	$[L^3/T]$	m^3/s

Character	SICADA designation	Explanation	Dimension	Unit
Q_m		Arithmetical mean flow during perturbation phase.	$[L^3/T]$	m^3/s
Q_1		Flow in test section during pumping with pump flow Q_{p1}, (flow logging).	$[L^3/T]$	m^3/s
Q_2		Flow in test section during pumping with pump flow Q_{p1}, (flow logging).	$[L^3/T]$	m^3/s
ΣQ	SumQ	Cumulative volumetric flow along borehole	$[L^3/T]$	m^3/s
ΣQ_0	SumQ0	Cumulative volumetric flow along borehole, undisturbed conditions (ie, not pumped)	$[L^3/T]$	m^3/s
ΣQ_1	SumQ1	Cumulative volumetric flow along borehole, with pump flow Q_{p1}	$[L^3/T]$	m^3/s
ΣQ_2	SumQ2	Cumulative volumetric flow along borehole, with pump flow Q_{p2}	$[L^3/T]$	m^3/s
ΣQ_{C1}	SumQC1	Corrected cumulative volumetric flow along borehole, ΣQ_1-ΣQ_0	$[L^3/T]$	m^3/s
ΣQ_{C2}	SumQC2	Corrected cumulative volumetric flow along borehole, ΣQ_2-ΣQ_0	$[L^3/T]$	m^3/s
q		Volumetric flow per flow passage area (Specific discharge (Darcy velocity, Darcy flux, Filtration velocity)).	$([L^3/T*L^2]$	m/s
V		Volume	$[L^3]$	m^3
V_w		Water volume in test section.	$[L^3]$	m^3
V_p		Total water volume injected/pumped during perturbation phase.	$[L^3]$	m^3
v		Velocity	$([L^3/T*L^2]$	m/s
v_a		Mean transport velocity (Average linear velocity (Average linear groundwater velocity, Mean microscopic velocity));. $v_a=q/n_e$	$([L^3/T*L^2]$	m/s
t		Time	[T]	hour,min,s
t_0		Duration of rest phase before perturbation phase.	[T]	s
t_p		Duration of perturbation phase. (from flow start as far as p_p).	[T]	s
t_F		Duration of recovery phase (from p_p to p_F).	[T]	s
t_1, t_2 etc		Times for various phases during a hydro test.	[T]	hour,min,s
dt		Running time from start of flow phase and recovery phase respectively.	[T]	s
dt_e		$dt_e = (dt \cdot tp) / (dt + tp)$ Agarwal equivalent time with dt as running time for recovery phase.	[T]	s
t_D		$t_D = T \cdot t / (S \cdot r_w^2)$. Dimensionless time	-	-
p		Static pressure; including non-dynamic pressure which depends on water velocity. Dynamic pressure is normally ignored in estimating the potential in groundwater flow relations.	$[M/(LT)^2]$	kPa
p_a		Atmospheric pressure	$[M/(LT)^2]$	kPa
p_t		Absolute pressure; $p_t=p_a+p_g$	$[M/(LT)^2]$	kPa
p_g		Gauge pressure; Difference between absolute pressure and atmospheric pressure.	$[M/(LT)^2]$	kPa
p_0		Initial pressure before test begins, prior to packer expansion.	$[M/(LT)^2]$	kPa
p_i		Pressure in measuring section before start of flow.	$[M/(LT)^2]$	kPa
p_f		Pressure during perturbation phase.	$[M/(LT)^2]$	kPa
p_s		Pressure during recovery.	$[M/(LT)^2]$	kPa
p_p		Pressure in measuring section before flow stop.	$[M/(LT)^2]$	kPa
p_F		Pressure in measuring section at end of recovery.	$[M/(LT)^2]$	kPa
p_D		$p_D=2\pi \cdot T \cdot p/(Q \cdot \rho_w g)$, Dimensionless pressure	-	-
dp		Pressure difference, drawdown of pressure surface between two points of time.	$[M/(LT)^2]$	kPa

Character	SICADA designation	Explanation	Dimension	Unit
dp_f		$dp_f = p_i - p_f$ or $= p_f – p_i$, drawdown/pressure increase of pressure surface between two points of time during perturbation phase. dp_f usually expressed positive.	$[M/(LT)^2]$	kPa
dp_s		$dp_s = p_s – p_p$ or $= p_p – p_s$, pressure increase/drawdown of pressure surface between two points of time during recovery phase. dp_s usually expressed positive.	$[M/(LT)^2]$	kPa
dp_p		$dp_p = p_i – p_p$ or $= p_p – p_i$, **maximal** pressure increase/drawdown of pressure surface between two points of time during perturbation phase. dp_p expressed positive.	$[M/(LT)^2]$	kPa
dp_F		$dp_F = p_p – p_F$ or $= p_F – p_p$, **maximal** pressure increase/drawdown of pressure surface between two points of time during recovery phase. dp_F expressed positive.	$[M/(LT)^2]$	kPa
H		Total head; (potential relative a reference level) (indication of h for phase as for p). $H=h_e+h_p+h_v$	[L]	m
h		Groundwater pressure level (hydraulic head (piezometric head; possible to use for level observations in boreholes, static head)); (indication of h for phase as for p). $h=h_e+h_p$	[L]	m
h_e		Height of measuring point (Elevation head); Level above reference level for measuring point.	[L]	m
h_p		Pressure head; Level above reference level for height of measuring point of stationary column of water giving corresponding static pressure at measuring point	[L]	m
h_v		Velocity head; height corresponding to the lifting for which the kinetic energy is capable (usually neglected in hydrogeology)	[L]	m
s		Drawdown; Drawdown from undisturbed level (same as dh_p, positive)	[L]	m
s_p		Drawdown in measuring section before flow stop.	[L]	m
			[L]	
h_0		Initial above reference level before test begins, prior to packer expansion.	[L]	m
h_i		Level above reference level in measuring section before start of flow.	[L]	m
h_f		Level above reference level during perturbation phase.	[L]	m
h_s		Level above reference level during recovery phase.	[L]	m
h_p		Level above reference level in measuring section before flow stop.	[L]	m
h_F		Level above reference level in measuring section at end of recovery.	[L]	m
dh		Level difference, drawdown of water level between two points of time.	[L]	m
dh_f		$dh_f = h_i - h_f$ or $= h_f – h_i$, drawdown/pressure increase of pressure surface between two points of time during perturbation phase. dh_f usually expressed positive.	[L]	m
dh_s		$dh_s = h_s – h_p$ or $= h_p – h_s$, pressure increase/drawdown of pressure surface between two points of time during recovery phase. dh_s usually expressed positive.	[L]	m
dh_p		$dh_p = h_i – h_p$ or $= h_p –h_i$, maximal pressure increase/drawdown of pressure surface between two points of time during perturbation phase. dh_p expressed positive.	[L]	m
dh_F		$dh_F = h_p – h_F$ or $= h_F – h_p$, maximal pressure increase/drawdown of pressure surface between two points of time during perturbation phase. dh_F expressed positive.	[L]	m
Te_w		Temperature in the test section (taken from temperature logging). Temperature		^oC
Te_{w0}		Temperature in the test section during undisturbed conditions (taken from temperature logging).		^oC

Character	SICADA designation	Explanation	Dimension	Unit
Te_o		Temperature in the observation section (taken from temperature logging). Temperature		^oC
EC_w		Electrical conductivity of water in test section.		mS/m
EC_{w0}		Electrical conductivity of water in test section during undisturbed conditions.		mS/m
EC_o		Electrical conductivity of water in observation section		mS/m
TDS_w		Total salinity of water in the test section.	$[M/L^3]$	mg/L
TDS_{w0}		Total salinity of water in the test section during undisturbed conditions.	$[M/L^3]$	mg/L
TDS_o		Total salinity of water in the observation section.	$[M/L^3]$	mg/L
g		Constant of gravitation (9.81 $m{*}s^{-2}$) (Acceleration due to gravity)	$[L/T^2]$	m/s^2
π	pi	Constant (approx 3.1416).	[-]	
r		Residual. $r= p_c-p_m$, $r= h_c-h_m$, etc. Difference between measured data (p_m, h_m, etc) and estimated data (p_c, h_c, etc)		
ME		Mean error in residuals. $ME = \frac{1}{n}\sum_{i=1}^{n} r_i$		
NME		Normalized ME. $NME=ME/(x_{MAX}-x_{MIN})$, x: measured variable considered.		
MAE		Mean absolute error. $MAE = \frac{1}{n}\sum_{i=1}^{n} \lvert r_i \rvert$		
NMAE		Normalized MAE. $NMAE=MAE/(x_{MAX}-x_{MIN})$, x: measured variable considered.		
RMS		Root mean squared error. $RMS = \left(\frac{1}{n}\sum_{i=1}^{n} r_i^2\right)^{0.5}$		
NRMS		Normalized RMR. $NRMR=RMR/(x_{MAX}-x_{MIN})$, x: measured variable considered.		
SDR		Standard deviation of residual. $SDR = \left(\frac{1}{n-1}\sum_{i=1}^{n} (r_i - ME)^2\right)^{0.5}$		
SEMR		Standard error of mean residual. $SEMR = \left(\frac{1}{n(n-1)}\sum_{i=1}^{n} (r_i - ME)^2\right)^{0.5}$		
Parameters				
Q/s		Specific capacity $s=dp_p$ or $s=s_p=h_0-h_p$ (open borehole)	$[L^2/T]$	m^2/s
D		Interpreted flow dimension according to Barker, 1988.	[-]	-
dt_1		Time of starting for semi-log or log-log evaluated characteristic counted from start of flow phase and recovery phase respectively.	[T]	s
dt_2		End of time for semi-log or log-log evaluated characteristic counted from start of flow phase and recovery phase respectively.	[T]	s
dt_L		Response time to obtain 0.1 m (or 1 kPa) drawdown in observation section counted from start of recovery phase.	[T]	s
TB		Flow capacity in a one-dimensional structure of width B and transmissivity T. Transient evaluation of one-dimensional structure	$[L^3/T]$	m^3/s
T		Transmissivity	$[L^2/T]$	m^2/s
T_M		Transmissivity according to Moye (1967)	$[L^2/T]$	m^2/s
T_Q		Evaluation based on Q/s and regression curve between Q/s and T, as example see Rhén et al (1997) p. 190.	$[L^2/T]$	m^2/s
T_S		Transmissivity evaluated from slug test	$[L^2/T]$	m^2/s

Character	SICADA designation	Explanation	Dimension	Unit
T_D		Transmissivity evaluated from PFL-Difference Flow Meter	$[L^2/T]$	m^2/s
T_I		Transmissivity evaluated from Impeller flow log	$[L^2/T]$	m^2/s
T_{Sf}, T_{Lf}		Transient evaluation based on semi-log or log-log diagram for perturbation phase in injection or pumping.	$[L^2/T]$	m^2/s
T_{Ss}, T_{Ls}		Transient evaluation based on semi-log or log-log diagram for recovery phase in injection or pumping.	$[L^2/T]$	m^2/s
T_T		Transient evaluation (log-log or lin-log). Judged best evaluation of T_{Sf}, T_{Lf}, T_{Ss}, T_{Ls}	$[L^2/T]$	m^2/s
T_{NLR}		Evaluation based on non-linear regression.	$[L^2/T]$	m^2/s
T_{Tot}		Judged most representative transmissivity for particular test section and (in certain cases) evaluation time with respect to available data (made by SKB at a later stage).	$[L^2/T]$	m^2/s
K		Hydraulic conductivity	[L/T]	m/s
K_s		Hydraulic conductivity based on spherical flow model	[L/T]	m/s
K_m		Hydraulic conductivity matrix, intact rock	[L/T]	m/s
k		Intrinsic permeability	$[L^2]$	m^2
kb		Permeability-thickness product: $kb=k \cdot b$	$[L^3]$	m^3
SB		Storage capacity in a one-dimensional structure of width B and storage coefficient S. Transient evaluation of one-dimensional structure	[L]	m
SB*		Assumed storage capacity in a one-dimensional structure of width B and storage coefficient S. Transient evaluation of one-dimensional structure	[L]	m
S		Storage coefficient, (Storativity)	[-]	-
S*		Assumed storage coefficient	[-]	-
S_y		Theoretical specific yield of water (Specific yield; unconfined storage. Defined as total porosity (n) minus retention capacity (S_r)	[-]	-
S_{ya}		Specific yield of water (Apparent specific yield); unconfined storage, field measuring. Corresponds to volume of water achieved on draining saturated soil or rock in free draining of a volumetric unit. $S_{ya}= S_y$ (often called S_y in literature)	[-]	-
S_r		Specific retention capacity, (specific retention of water, field capacity) (Specific retention); unconfined storage. Corresponds to water volume that the soil or rock has left after free draining of saturated soil or rock.	[-]	-
S_f		Fracture storage coefficient	[-]	-
S_m		Matrix storage coefficient	[-]	-
S_{NLR}		Storage coefficient, evaluation based on non-linear regression	[-]	-
S_{Tot}		Judged most representative storage coefficient for particular test section and (in certain cases) evaluation time with respect to available data (made by SKB at a later stage).	[-]	-
S_s		Specific storage coefficient; confined storage.	[1/L]	1/m
S_s*		Assumed specific storage coefficient; confined storage.	[1/L]	1/m
c_f		Hydraulic resistance: The hydraulic resistance is an aquitard with a flow vertical to a two-dimensional formation. The inverse of c is also called Leakage coefficient. $c_f=b'/K'$ where b´ is thickness of the aquitard and K´ its hydraulic conductivity across the aquitard.	[T]	s
L_f		Leakage factor: $L_f =(K \cdot b \cdot c_f)^{0.5}$ where K represents characteristics of the aquifer.	[L]	m
ξ	Skin	Skin factor	[-]	-

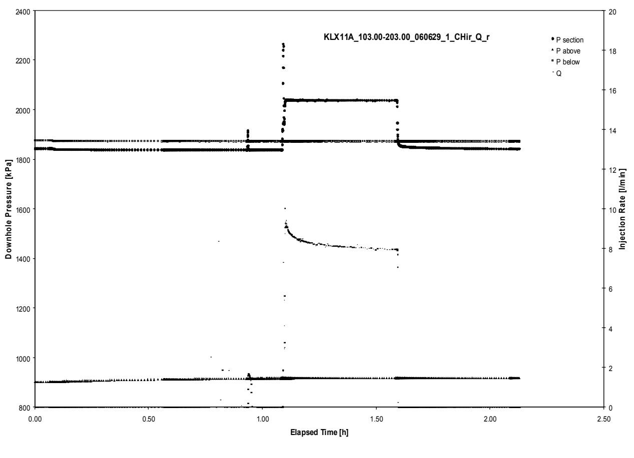
Character	SICADA designation	Explanation	Dimension	Unit
ξ^*	Skin	Assumed skin factor	[-]	-
C		Wellbore storage coefficient	$[(LT^2)\cdot M^2]$	m^3/Pa
C_D		$C_D = C\cdot\rho_w g/(2\pi\cdot S\cdot r_w^2)$, Dimensionless wellbore storage coefficient	[-]	-
ω	Stor-ratio	$\omega = S_f/(S_f + S_m)$, storage ratio (Storativity ratio); the ratio of storage coefficient between that of the fracture and total storage.	[-]	-
λ	Interflow-coeff	$\lambda = \alpha\cdot(K_m/K_f)\cdot r_w^2$ interporosity flow coefficient.	[-]	-
T_{GRF}		Transmissivity interpreted using the GRF method	$[L^2/T]$	m^2/s
S_{GRF}		Storage coefficient interpreted using the GRF method	[1/L]	1/m
D_{GRF}		Flow dimension interpreted using the GRF method	[-]	-
c_w		Water compressibility; corresponding to β in hydrogeological literature.	$[(LT^2)/M]$	1/Pa
c_r		Pore-volume compressibility, (rock compressibility); Corresponding to α/n in hydrogeological literature.	$[(LT^2)/M]$	1/Pa
c_t		$c_t = c_r + c_w$, total compressibility; compressibility per volumetric unit of rock obtained through multiplying by the total porosity, n. (Presence of gas or other fluids can be included in c_t if the degree of saturation (volume of respective fluid divided by n) of the pore system of respective fluid is also included)	$[(LT^2)/M]$	1/Pa
nc_t		Porosity-compressibility factor: $nc_t = n\cdot c_t$	$[(LT^2)/M]$	1/Pa
nc_tb		Porosity-compressibility-thickness product: $nc_tb = n\cdot c_t\cdot b$	$[(L^2T^2)/M]$	m/Pa
n		Total porosity	-	-
n_e		Kinematic porosity, (Effective porosity)	-	-
e		Transport aperture. $e = n_e\cdot b$	[L]	m
ρ	Density	Density	$[M/L^3]$	$kg/(m^3)$
ρ_w	Density-w	Fluid density in measurement section during pumping/injection	$[M/L^3]$	$kg/(m^3)$
ρ_o	Density-o	Fluid density in observation section	$[M/L^3]$	$kg/(m^3)$
ρ_{sp}	Density-sp	Fluid density in standpipes from measurement section	$[M/L^3]$	$kg/(m^3)$
μ	my	Dynamic viscosity	[M/LT]	Pa s
μ_w	my	Dynamic viscosity (Fluid density in measurement section during pumping/injection)	[M/LT]	Pa s
FC_T		Fluid coefficient for intrinsic permeability, transference of k to K; $K=FC_T\cdot k$; $FC_T=\rho_w\cdot g/\mu_w$	[1/LT]	1/(ms)
FC_S		Fluid coefficient for porosity-compressibility, transference of c_t to S_s ; $S_s=FC_S\cdot n\cdot c_t$; $FC_S=\rho_w\cdot g$	$[M/T^2L^2]$	Pa/m
Index on K, T and S				
S		S: semi-log		
L		L: log-log		
f		Pump phase or injection phase, designation following S or L (withdrawal)		
s		Recovery phase, designation following S or L (recovery)		
NLR		NLR: Non-linear regression. Performed on the entire test sequence, perturbation and recovery		
M		Moye		
GRF		Generalised Radial Flow according to Barker (1988)		
m		Matrix		
f		Fracture		
T		Judged best evaluation based on transient evaluation.		

Character	SICADA designation	Explanation	Dimension	Unit
Tot		Judged most representative parameter for particular test section and (in certain cases) evaluation time with respect to available data (made by SKB at a later stage).		
b		Bloch property in a numerical groundwater flow model		
e		Effective property (constant) within a domain in a numerical groundwater flow model.		
Index on p and Q				
0		Initial condition, undisturbed condition in open holes		
i		Natural, "undisturbed" condition of formation parameter		
f		Pump phase or injection phase (withdrawal, flowing phase)		
s		Recovery, shut-in phase		
p		Pressure or flow in measuring section at end of perturbation period		
F		Pressure in measuring section at end of recovery period.		
m		Arithmetical mean value		
c		Estimated value. The index is placed last if index for “where” and “what” are used. Simulated value		
m		Measured value. The index is placed last if index for “where” and “what” are used. Measured value		
Some miscellaneous indexes on p and h				
w		Test section (final difference pressure during flow phase in test section can be expressed dp_{wp}; First index shows “where” and second index shows “what”)		
o		Observation section (final difference pressure during flow phase in observation section can be expressed dp_{op}; First index shows “where” and second index shows “what”)		
f		Fresh-water head. Water is normally pumped up from section to measuring hoses where pressure and level are observed. Density of the water is therefore approximately the same as that of the measuring section. Measured groundwater level is therefore normally represented by what is defined as point-water head. If pressure at the measuring level is recalculated to a level for a column of water with density of fresh water above the measuring point it is referred to as fresh-water head and h is indicated last by an f. Observation section (final level during flow phase in observation section can be expressed h_{opf}; the first index shows “where” and the second index shows “what” and the last one “recalculation”)		

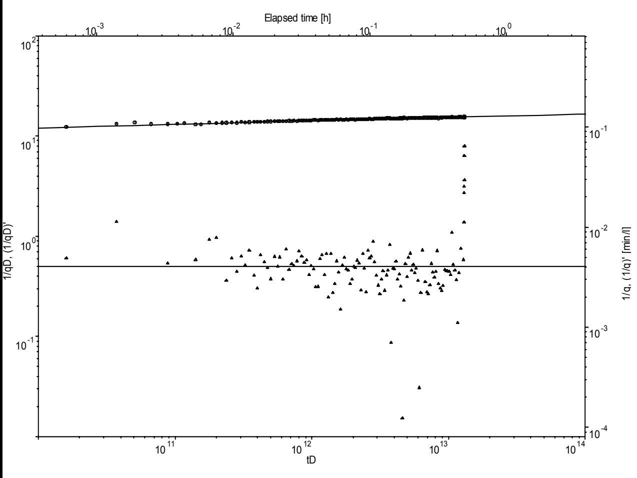
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060629 14:32
Test section from - to (m):	103.00-203.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

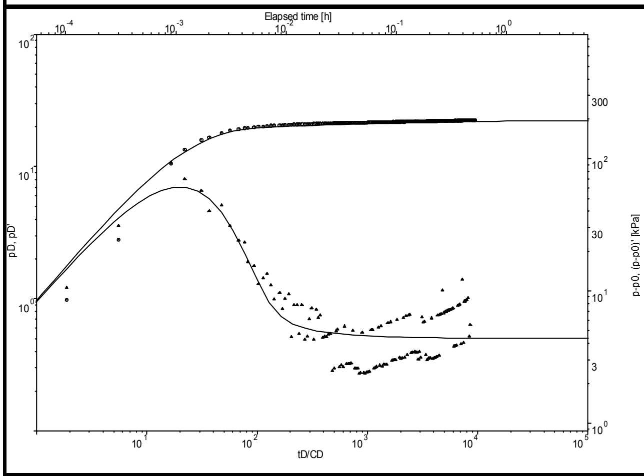
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	1842		
p_i (kPa) =	1837		
p_p(kPa) =	2035	p_F (kPa) =	1840
Q_p (m^3/s)=	1.31E-04		
tp (s) =	1800	t_F (s) =	1800
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	9.6		
Derivative fact.=	0.1	Derivative fact.=	0.04
Results		**Results**	
Q/s (m^2/s)=	6.5E-06		
T_M (m^2/s)=	8.5E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.73	dt_1 (min) =	0.94
dt_2 (min) =	21.10	dt_2 (min) =	27.40
T (m^2/s) =	1.6E-05	T (m^2/s) =	2.5E-05
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.6E-07	K_s (m/s) =	2.5E-07
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.1E-09
C_D (-) =	NA	C_D (-) =	3.4E-01
ξ (-) =	6.7	ξ (-) =	13.2
T_{GRF}(m^2/s) =	6.2E-06	T_{GRF}(m^2/s) =	7.4E-06
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	2.1	D_{GRF} (-) =	2.1
Selected representative parameters.			
dt_1 (min) =	0.73	C (m^3/Pa) =	3.1E-09
dt_2 (min) =	21.10	C_D (-) =	3.4E-01
T_T (m^2/s) =	1.6E-05	ξ (-) =	6.7
S (-) =	1.0E-06		
K_s (m/s) =	8.0E-07		
S_s (1/m) =	5.0E-08		

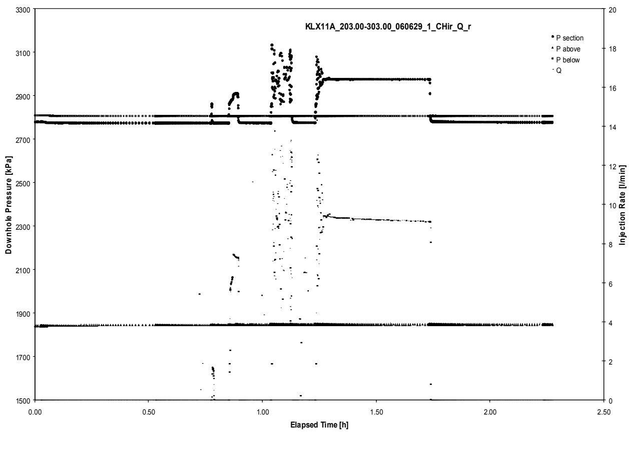
Comments:

The recommended transmissivity of 1.6E-5 m2/s was derived from the radial flow analysis of the CHi phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-6 to 3.0E-5 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,838.6 kPa.

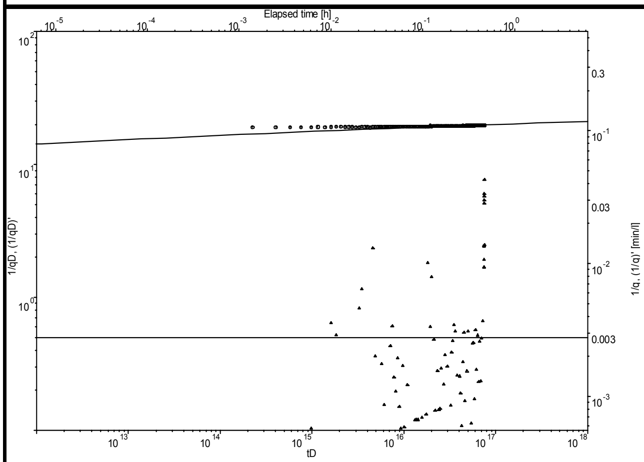
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060629 18:03
Test section from - to (m):	203.00-303.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

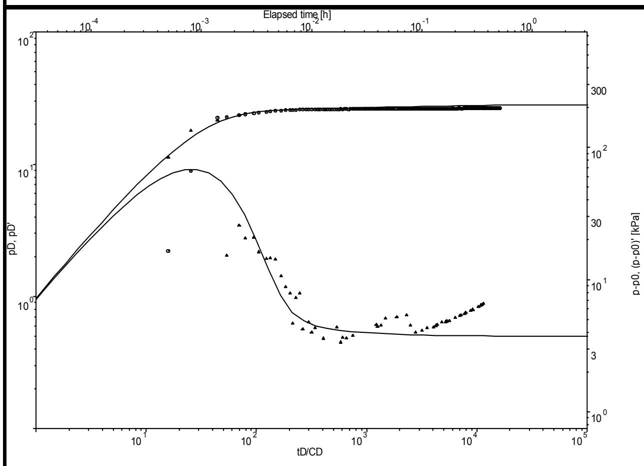
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	2780		
p_i (kPa) =	2776		
p_p(kPa) =	2975	p_F (kPa) =	2777
Q_p (m^3/s)=	1.52E-04		
tp (s) =	1800	t_F (s) =	1800
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.1		
Derivative fact.=	0.02	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	7.5E-06		
T_M (m^2/s)=	9.7E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.68	dt_1 (min) =	0.40
dt_2 (min) =	23.68	dt_2 (min) =	5.27
T (m^2/s) =	2.4E-05	T (m^2/s) =	3.2E-05
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.4E-07	K_s (m/s) =	3.2E-07
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.3E-09
C_D (-) =	NA	C_D (-) =	2.6E-01
ξ (-) =	18.7	ξ (-) =	19.1
T_{GRF}(m^2/s) =	8.7E-06	T_{GRF}(m^2/s) =	8.1E-06
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	2.1	D_{GRF} (-) =	2.1

Selected representative parameters.

dt_1 (min) =	0.40	C (m^3/Pa) =	2.3E-09
dt_2 (min) =	5.27	C_D (-) =	2.6E-01
T_T (m^2/s) =	3.2E-05	ξ (-) =	19.1
S (-) =	1.0E-06		
K_s (m/s) =	1.6E-06		
S_s (1/m) =	5.0E-08		

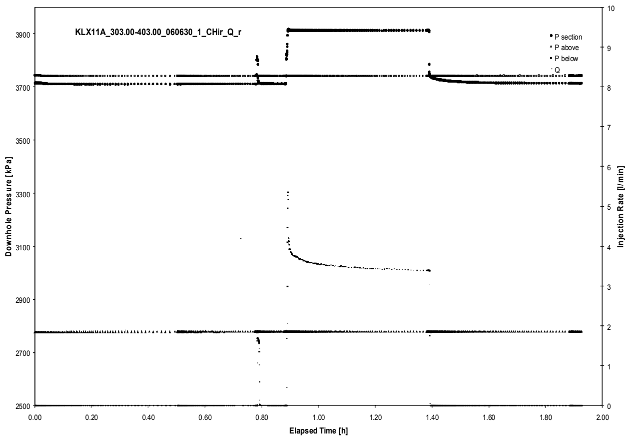
Comments:

The recommended transmissivity of 3.2E-5 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9.0E-6 to 6.0E-5 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,776.6 kPa.

Test Summary Sheet

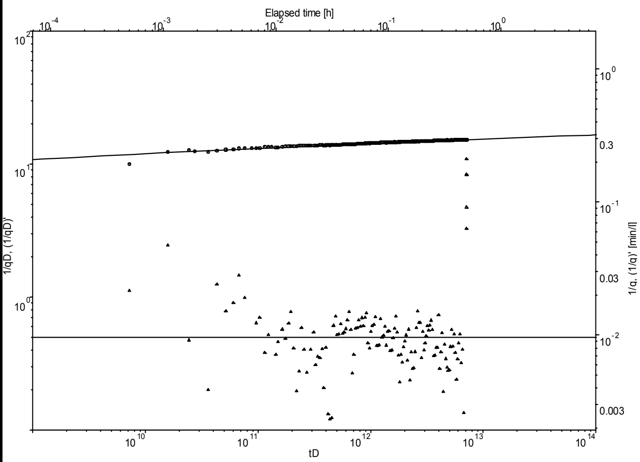
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060630 09:15
Test section from - to (m):	303.00-403.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

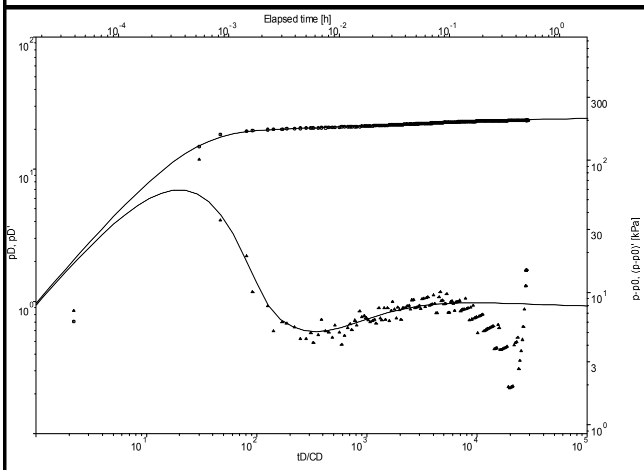


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3714		
p_i (kPa) =	3712		
p_p(kPa) =	3907	p_F (kPa) =	3713
Q_p (m^3/s)=	5.67E-05		
tp (s) =	1800	t_F (s) =	1800
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.6		
Derivative fact.=	0.07	Derivative fact.=	0.09
Results		**Results**	
Q/s (m^2/s)=	2.9E-06		
T_M (m^2/s)=	3.7E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.52	dt_1 (min) =	1.78
dt_2 (min) =	23.00	dt_2 (min) =	9.33
T (m^2/s) =	6.9E-06	T (m^2/s) =	6.0E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	6.9E-08	K_s (m/s) =	6.0E-08
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	4.4E-10
C_D (-) =	NA	C_D (-) =	4.8E-02
ξ (-) =	6.8	ξ (-) =	14.2
T_{GRF}(m^2/s) =	1.5E-06	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	NA
D_{GRF} (-) =	2.2	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	1.78	C (m^3/Pa) =	4.4E-10
dt_2 (min) =	9.33	C_D (-) =	4.8E-02
T_T (m^2/s) =	6.0E-06	ξ (-) =	14.2
S (-) =	1.0E-06		
K_s (m/s) =	3.0E-07		
S_s (1/m) =	5.0E-08		

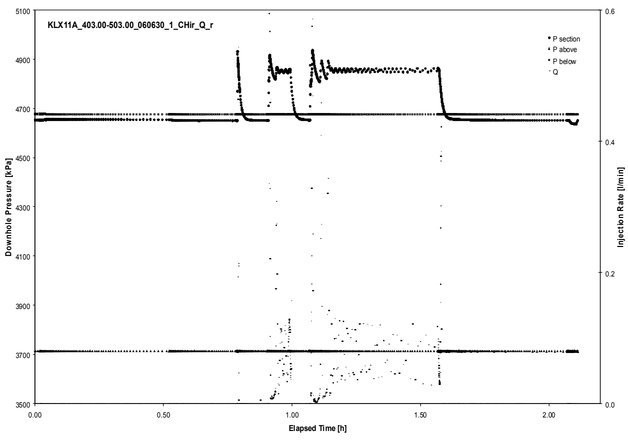
Comments:

The recommended transmissivity of 6.0E-6 m2/s was derived from the radial flow analysis of the CHir phase (outer zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3.0E-6 to 9.0E-6 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,705.2 kPa.

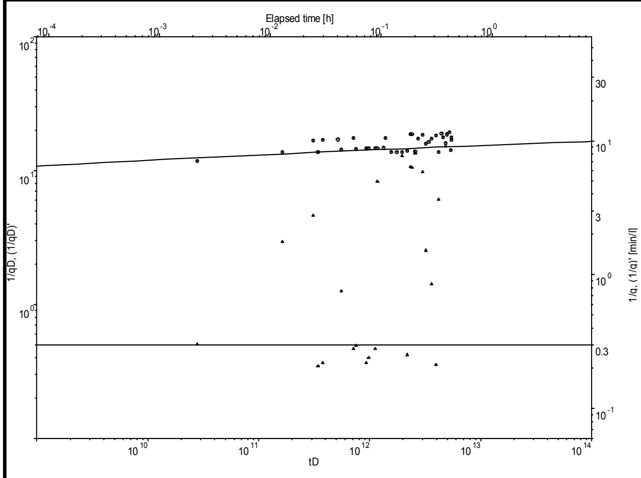
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060630 13:11
Test section from - to (m):	403.00-503.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

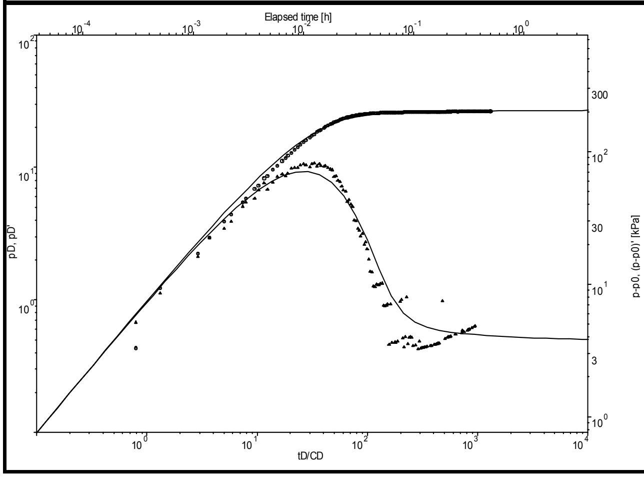
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4653		
p_i (kPa) =	4650		
p_p(kPa) =	4854	p_F (kPa) =	4650
Q_p (m^3/s)=	1.17E-06		
tp (s) =	1800	t_F (s) =	1800
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.0		
Derivative fact.=	0.07	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	5.6E-08		
T_M (m^2/s)=	7.3E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	2.1E-07	T (m^2/s) =	2.7E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.1E-09	K_s (m/s) =	2.7E-09
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.4E-10
C_D (-) =	NA	C_D (-) =	2.6E-02
ξ (-) =	8.5	ξ (-) =	20.2
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	2.4E-10
dt_2 (min) =	NA	C_D (-) =	2.6E-02
T_T (m^2/s) =	2.7E-07	ξ (-) =	20.2
S (-) =	1.0E-06		
K_s (m/s) =	1.4E-08		
S_s (1/m) =	5.0E-08		

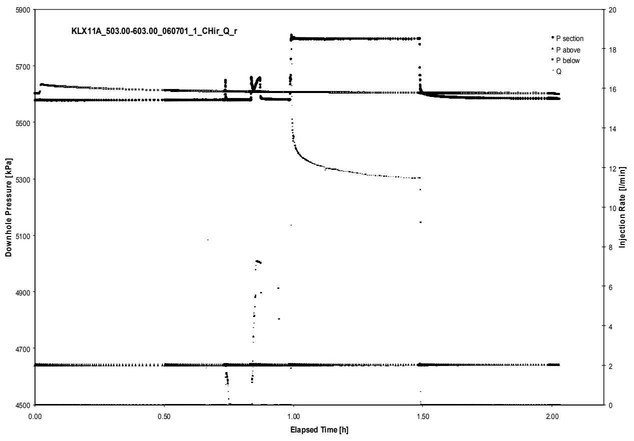
Comments:

The recommended transmissivity of 2.7•10-7 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0•10-8 to 6.0•10-7 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,705.2 kPa.

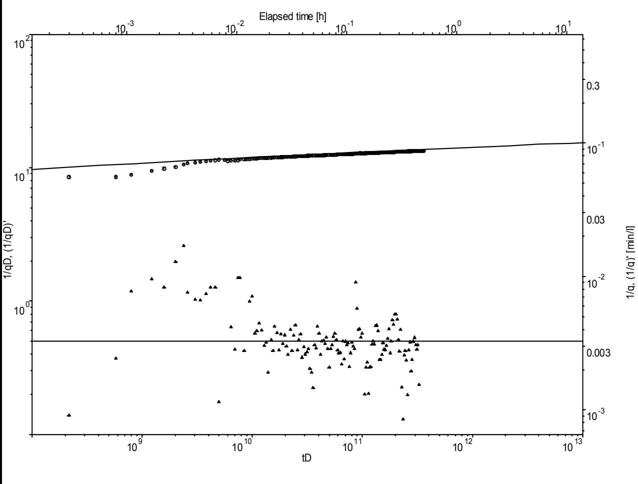
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060701 08:47
Test section from - to (m):	503.00-603.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

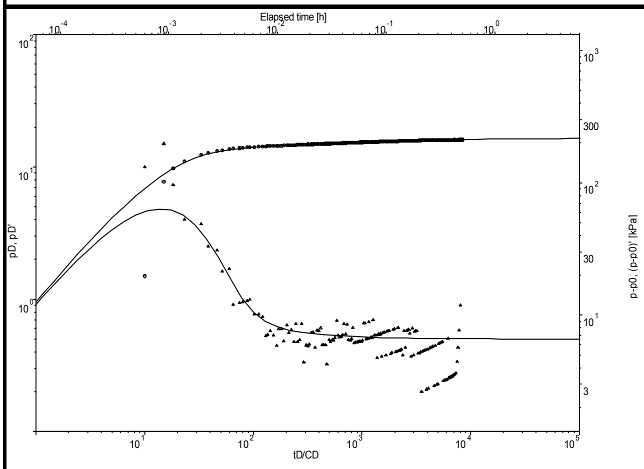
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5578		
p_i (kPa) =	5580		
p_p(kPa) =	5795	p_F (kPa) =	5600
Q_p (m^3/s)=	1.91E-04		
tp (s) =	1800	t_F (s) =	1800
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.6		
Derivative fact.=	0.02	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	8.7E-06		
T_M (m^2/s)=	1.1E-05		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.12	dt_1 (min) =	0.68
dt_2 (min) =	26.70	dt_2 (min) =	22.28
T (m^2/s) =	1.9E-05	T (m^2/s) =	2.4E-05
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.9E-07	K_s (m/s) =	2.4E-07
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.3E-09
C_D (-) =	NA	C_D (-) =	3.6E-01
ξ (-) =	4.8	ξ (-) =	7.4
T_{GRF}(m^2/s) =	7.7E-06	T_{GRF}(m^2/s) =	9.0E-06
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	2.1	D_{GRF} (-) =	2.1

Selected representative parameters.

dt_1 (min) =	0.68	C (m^3/Pa) =	3.3E-09
dt_2 (min) =	22.28	C_D (-) =	3.6E-01
T_T (m^2/s) =	2.4E-05	ξ (-) =	7.4
S (-) =	1.0E-06		
K_s (m/s) =	1.2E-06		
S_s (1/m) =	5.0E-08		

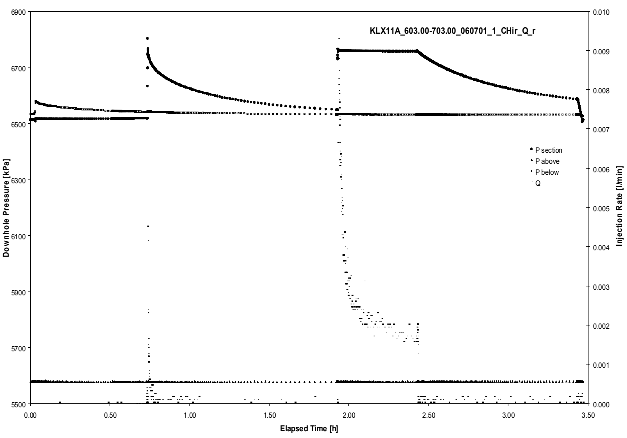
Comments:

The recommended transmissivity of 2.4E-5 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-6 to 5.0E-5 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,579.0 kPa.

Test Summary Sheet

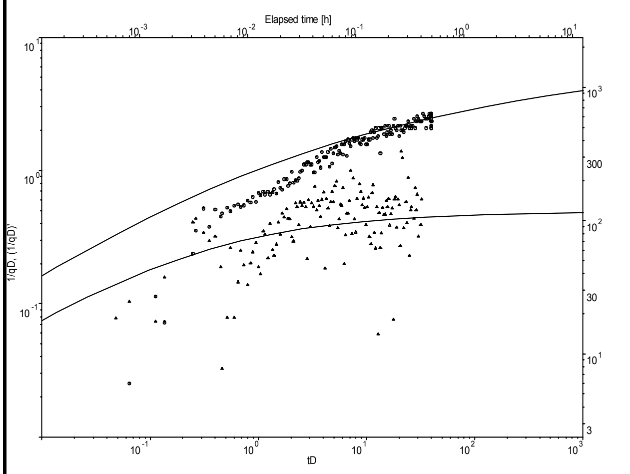
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060701 12:14
Test section from - to (m):	603.00-703.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

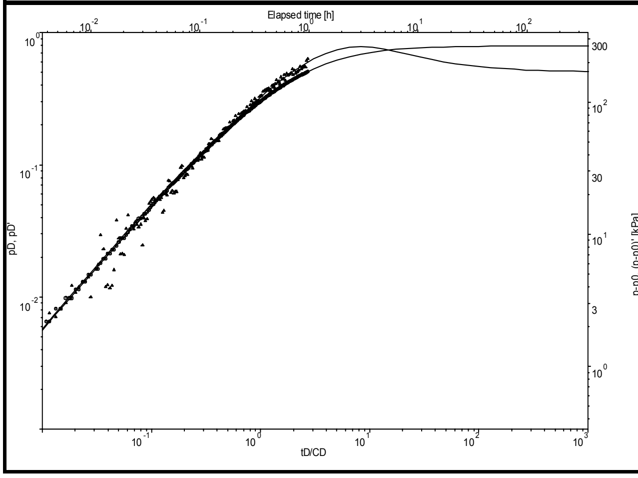


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6514		
p_i (kPa) =	6549		
p_p(kPa) =	6754	p_F (kPa) =	6586
Q_p (m^3/s)=	3.33E-08		
tp (s) =	1800	t_F (s) =	3600
S el S* (-)=	1.00E-06	S el S* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	17.1		
Derivative fact.=	0.2	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.6E-09		
T_M (m^2/s)=	2.1E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	5.3E-10	T (m^2/s) =	2.3E-10
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.3E-12	K_s (m/s) =	2.3E-12
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.9E-10
C_D (-) =	NA	C_D (-) =	2.1E-02
ξ (-) =	-1.4	ξ (-) =	-1.9
T_{GRF}(m^2/s) =	1.6E-09	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	NA
D_{GRF} (-) =	1.58	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	1.9E-10
dt_2 (min) =	NA	C_D (-) =	2.1E-02
T_T (m^2/s) =	2.3E-10	ξ (-) =	-1.9
S (-) =	1.0E-06		
K_s (m/s) =	1.2E-11		
S_s (1/m) =	5.0E-08		

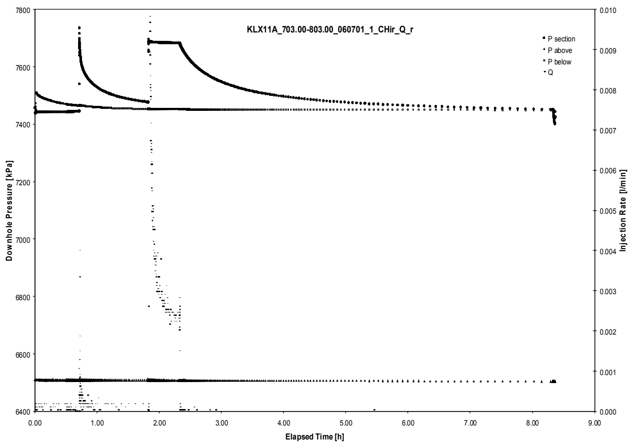
Comments:

The recommended transmissivity of 2.3E-10 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9.0E-11 to 6.0E-10 m2/s (this range includes the transmissivity from the CHi phase). The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 6,513.4 kPa.

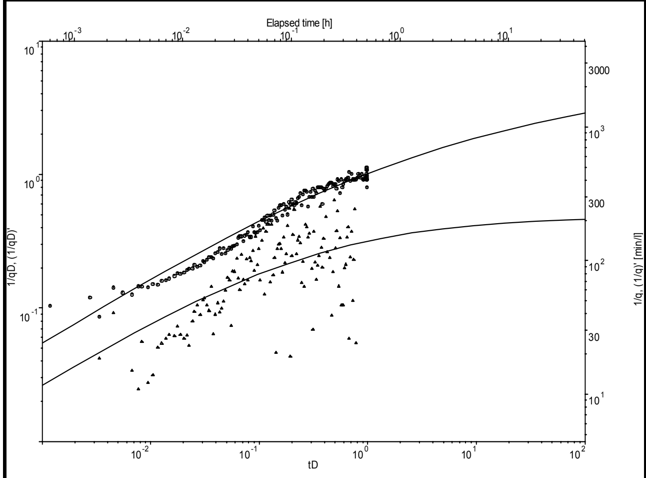
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060701 17:09
Test section from - to (m):	703.00-803.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

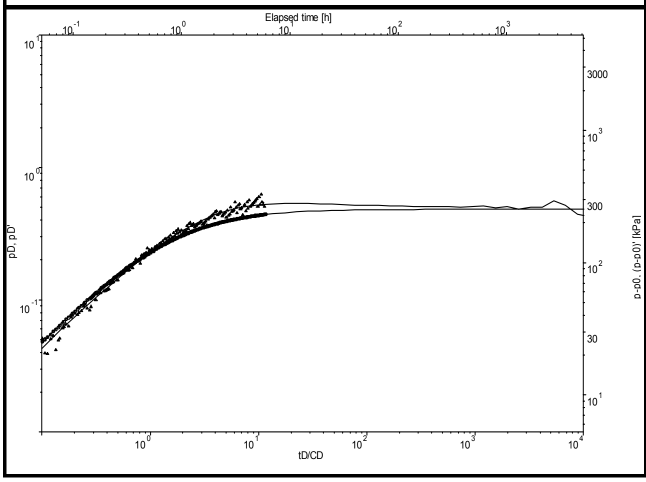
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	7443		
p_i (kPa) =	7477		
p_p(kPa) =	7680	p_F (kPa) =	7451
Q_p (m^3/s)=	3.33E-08		
tp (s) =	1800	t_F (s) =	21600
S el S* (-)=	1.00E-06	S el S* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	18.6		
Derivative fact.=	0.1	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.6E-09		
T_M (m^2/s)=	2.1E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	2.9E-10	T (m^2/s) =	2.0E-10
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.9E-12	K_s (m/s) =	2.0E-12
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.4E-10
C_D (-) =	NA	C_D (-) =	2.6E-02
ξ (-) =	-3.0	ξ (-) =	-2.7
T_{GRF}(m^2/s) =	6.0E-10	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	NA
D_{GRF} (-) =	1.5	D_{GRF} (-) =	NA

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	2.4E-10
dt_2 (min) =	NA	C_D (-) =	2.6E-02
T_T (m^2/s) =	2.0E-10	ξ (-) =	-2.7
S (-) =	1.0E-06		
K_s (m/s) =	1.0E-11		
S_s (1/m) =	5.0E-08		

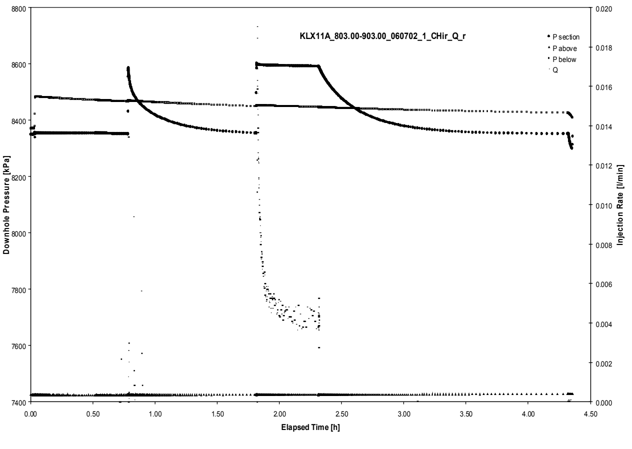
Comments:

The recommended transmissivity of 2.0E-10 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9.0E-11 to 4.0E-10 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 7,429.3 kPa.

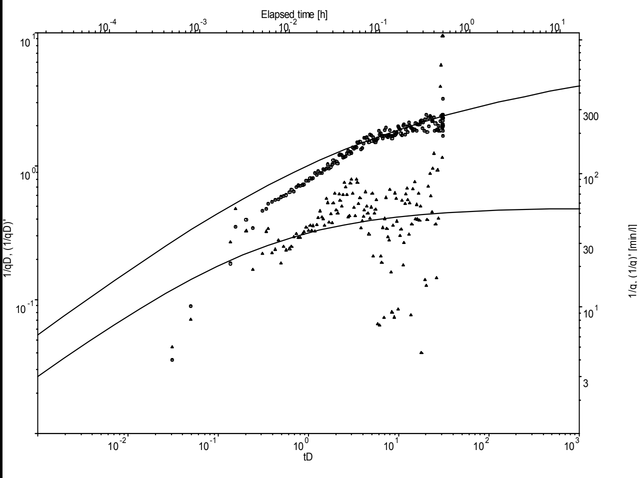
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060702 09:11
Test section from - to (m):	803.00-903.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

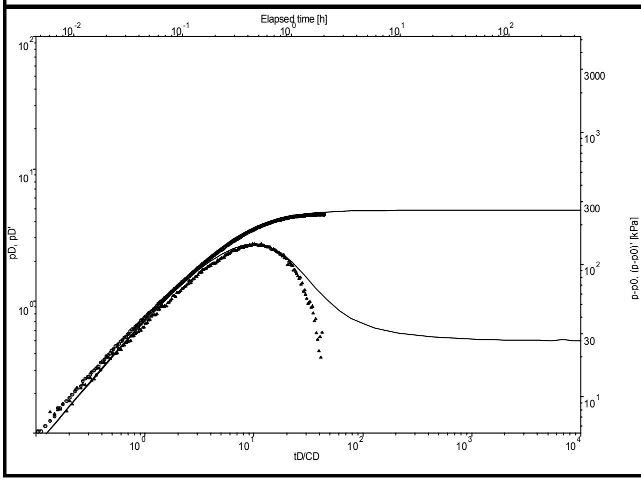
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	8351		
p_i (kPa) =	8354		
p_p(kPa) =	8589	p_F (kPa) =	8352
Q_p (m^3/s)=	6.67E-08		
tp (s) =	1800	t_F (s) =	7200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	20.1		
Derivative fact.=	0.14	Derivative fact.=	0.07
Results		**Results**	
Q/s (m^2/s)=	2.8E-09		
T_M (m^2/s)=	3.6E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	3.20	dt_1 (min) =	NA
dt_2 (min) =	22.68	dt_2 (min) =	NA
T (m^2/s) =	9.8E-10	T (m^2/s) =	2.9E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	9.8E-12	K_s (m/s) =	2.9E-11
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.1E-10
C_D (-) =	NA	C_D (-) =	3.4E-02
ξ (-) =	-1.8	ξ (-) =	1.7
T_{GRF}(m^2/s) =	1.8E-09	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	NA
D_{GRF} (-) =	1.7	D_{GRF} (-) =	NA

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	3.1E-10
dt_2 (min) =	NA	C_D (-) =	3.4E-02
T_T (m^2/s) =	2.9E-09	ξ (-) =	1.7
S (-) =	1.0E-06		
K_s (m/s) =	1.5E-10		
S_s (1/m) =	5.0E-08		

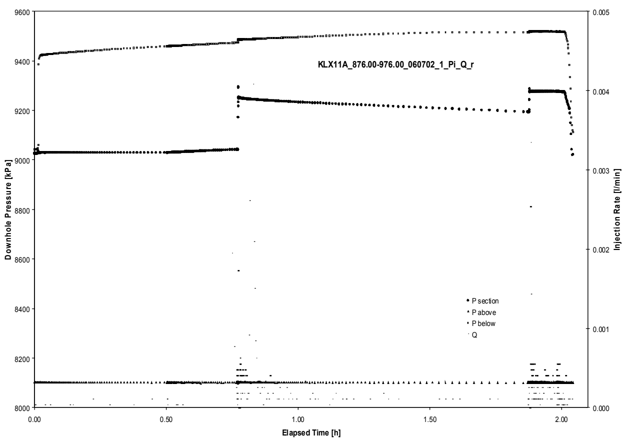
Comments:

The recommended transmissivity of 2.9E-9 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-10 to 4.0E-9 m2/s (this range includes the derived transmissivity of the CHi phase). The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 8,333.1 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060702 14:45
Test section from - to (m):	876.00-976.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

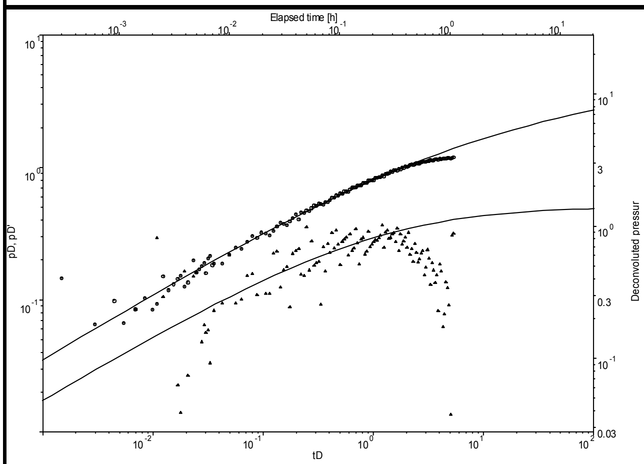


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	9027		
p_i (kPa) =	9042		
p_p(kPa) =	9253	p_F (kPa) =	9202
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	3978
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	21.2		
Derivative fact.=	NA	Derivative fact.=	0.06
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	4.0E-11
S (-) =	Na	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	4.0E-13
S_s (1/m) =	NA	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.6E-10
C_D (-) =	NA	C_D (-) =	2.8E-02
ξ (-) =	NA	ξ (-) =	-1.5
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	6.2E-10
S_{GRF}(-) =	NA	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	NA	D_{GRF} (-) =	1.33

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	2.6E-10
dt_2 (min) =	NA	C_D (-) =	2.8E-02
T_T (m^2/s) =	4.0E-11	ξ (-) =	-1.5
S (-) =	1.0E-06		
K_s (m/s) =	2.0E-12		
S_s (1/m) =	5.0E-08		

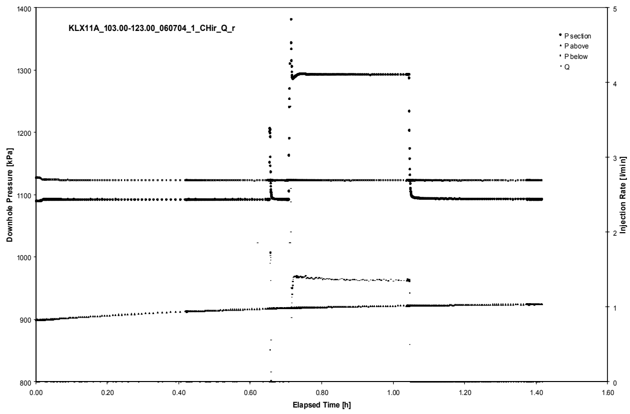
Comments:

The recommended transmissivity of 4.0E-11 m2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 1.0E-11 to 8.0E-11 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

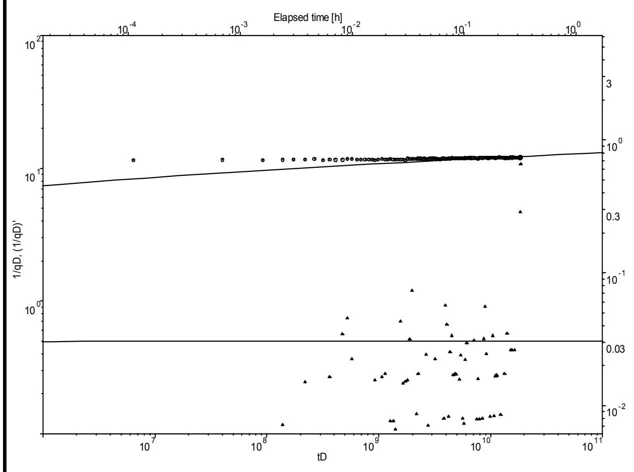
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060704 08:19
Test section from - to (m):	103.00-123.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

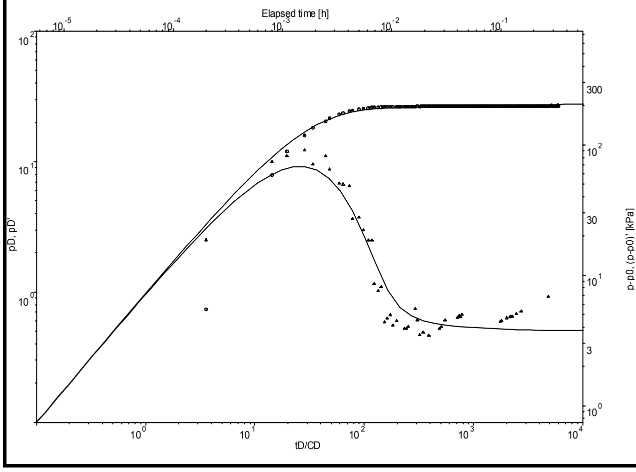
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	1091		
p_i (kPa) =	1093		
p_p(kPa) =	1293	p_F (kPa) =	1093
Q_p (m^3/s)=	2.33E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	8.4		
Derivative fact.=	0.05	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.1E-06		
T_M (m^2/s)=	1.2E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.49	dt_1 (min) =	0.61
dt_2 (min) =	16.94	dt_2 (min) =	6.73
T (m^2/s) =	2.2E-06	T (m^2/s) =	4.9E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.1E-07	K_s (m/s) =	2.5E-07
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.3E-10
C_D (-) =	NA	C_D (-) =	7.0E-02
ξ (-) =	4.7	ξ (-) =	19.8
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.

dt_1 (min) =	0.61	C (m^3/Pa) =	6.3E-10
dt_2 (min) =	6.73	C_D (-) =	7.0E-02
T_T (m^2/s) =	4.9E-06	ξ (-) =	19.8
S (-) =	1.0E-06		
K_s (m/s) =	2.5E-07		
S_s (1/m) =	5.0E-08		

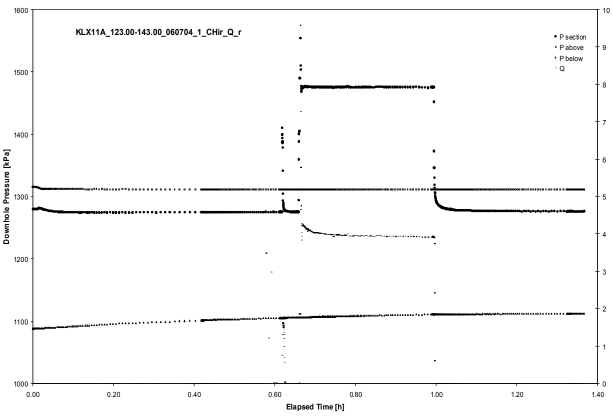
Comments:

The recommended transmissivity of 4.9E-6 m2/s was derived from the radial flow analysis of the CHir phase, which was considered to be more reliable. The confidence range for the interval transmissivity is estimated to be 3.0E-6 to 8.0E-6 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,092.9 kPa.

Test Summary Sheet

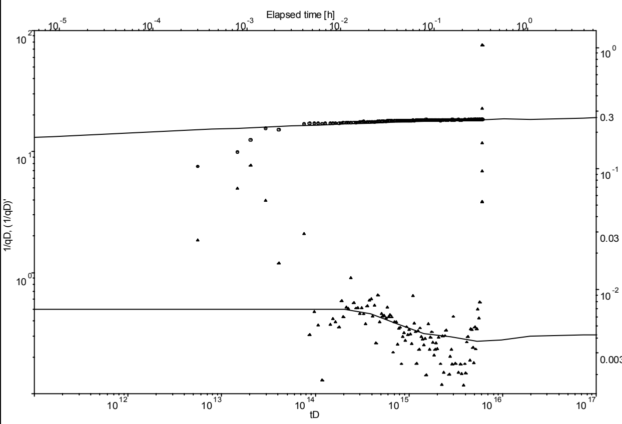
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060704 10:31
Test section from - to (m):	123.00-143.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

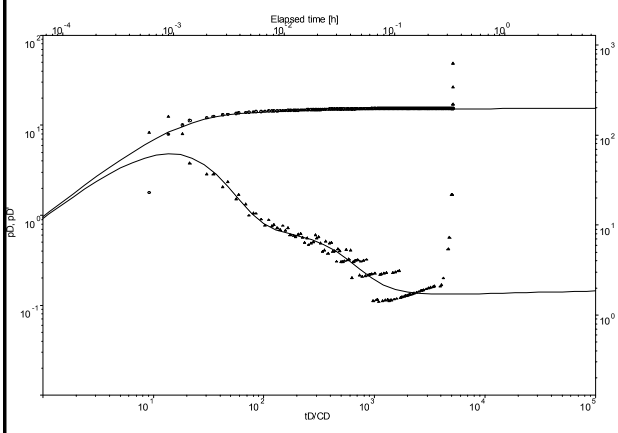


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	1279		
p_i (kPa) =	1275		
p_p(kPa) =	1475	p_F (kPa) =	1275
Q_p (m^3/s)=	6.50E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	8.7		
Derivative fact.=	0.13	Derivative fact.=	0.09
Results		**Results**	
Q/s (m^2/s)=	3.2E-06		
T_M (m^2/s)=	3.3E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.32	dt_1 (min) =	0.47
dt_2 (min) =	1.16	dt_2 (min) =	1.60
T (m^2/s) =	9.4E-06	T (m^2/s) =	8.1E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	4.7E-07	K_s (m/s) =	4.1E-07
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.2E-09
C_D (-) =	NA	C_D (-) =	1.4E-01
ξ (-) =	10.2	ξ (-) =	7.9
T_{GRF}(m^2/s) =	1.2E-06	T_{GRF}(m^2/s) =	1.2E-06
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	2.3	D_{GRF} (-) =	2.3

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0.47	C (m^3/Pa) =	1.2E-09
dt_2 (min) =	1.60	C_D (-) =	1.4E-01
T_T (m^2/s) =	8.1E-06	ξ (-) =	7.9
S (-) =	1.0E-06		
K_s (m/s) =	4.1E-07		
S_s (1/m) =	5.0E-08		

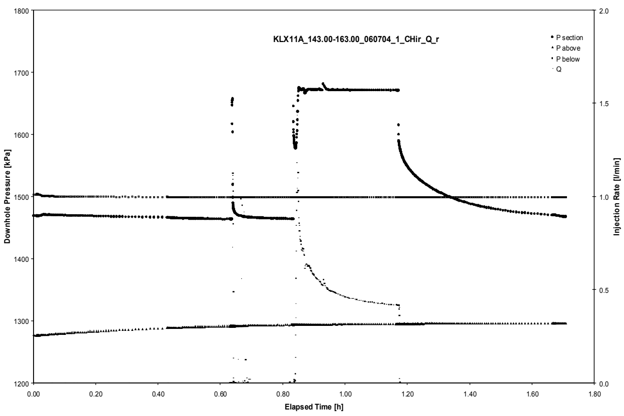
Comments:

The recommended transmissivity of 8.1E-6 m2/s was derived from the radial flow analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7.0E-6 to 1.0E-5 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,275.5 kPa.

Test Summary Sheet

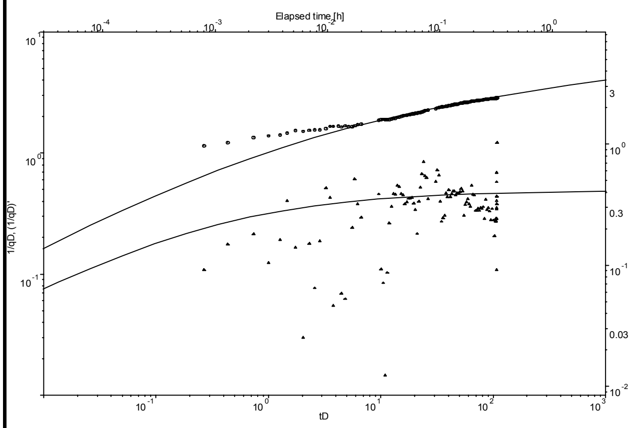
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060704 12:49
Test section from - to (m):	143.00-163.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

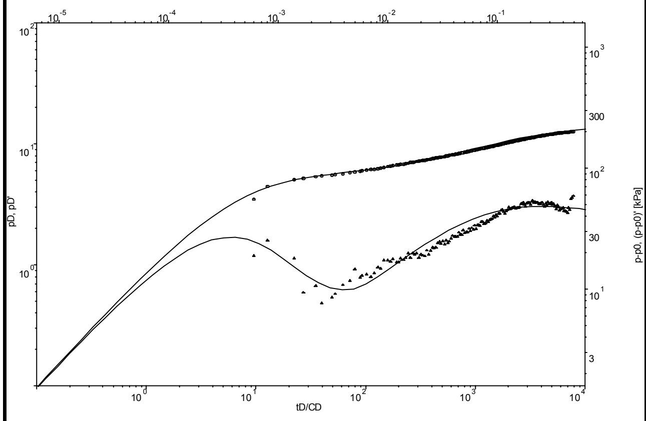


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	1469		
p_i (kPa) =	1464		
p_p(kPa) =	1671	p_F (kPa) =	1469
Q_p (m^3/s)=	6.67E-06		
tp (s) =	1200	t_F (s) =	1800
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	8.9		
Derivative fact.=	0.02	Derivative fact.=	0.07
Results		**Results**	
Q/s (m^2/s)=	3.2E-07		
T_M (m^2/s)=	3.3E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2.41	dt_1 (min) =	6.49
dt_2 (min) =	19.31	dt_2 (min) =	27.49
T (m^2/s) =	1.5E-07	T (m^2/s) =	1.4E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	7.5E-09	K_s (m/s) =	7.0E-09
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	9.5E-11
C_D (-) =	NA	C_D (-) =	1.0E-02
ξ (-) =	-3.5	ξ (-) =	1.1
T_{GRF}(m^2/s) =	6.7E-08	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	NA
D_{GRF} (-) =	2.3	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	6.49	C (m^3/Pa) =	9.5E-11
dt_2 (min) =	27.49	C_D (-) =	1.0E-02
T_T (m^2/s) =	1.4E-07	ξ (-) =	1.1
S (-) =	1.0E-06		
K_s (m/s) =	7.0E-09		
S_s (1/m) =	5.0E-08		

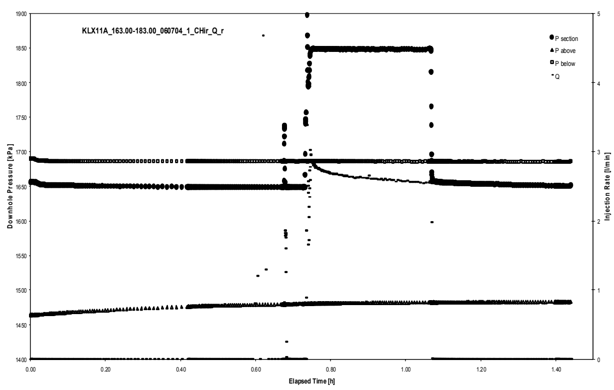
Comments:

The recommended transmissivity of 1.4E-7 m2/s was derived from the radial flow analysis of the CHir phase (outer zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-8 to 4.0E-7 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,443.8 kPa.

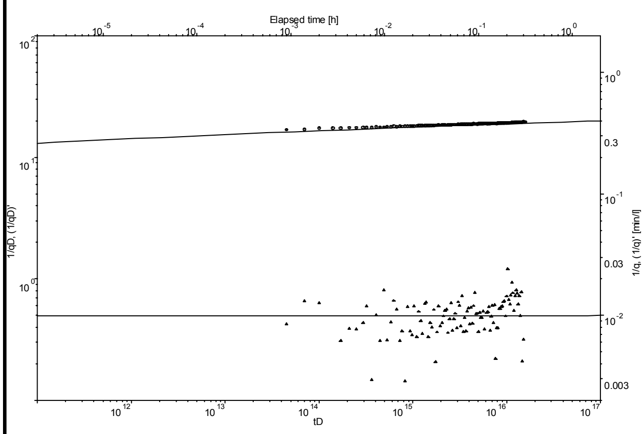
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060704 15:05
Test section from - to (m):	163.00-183.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

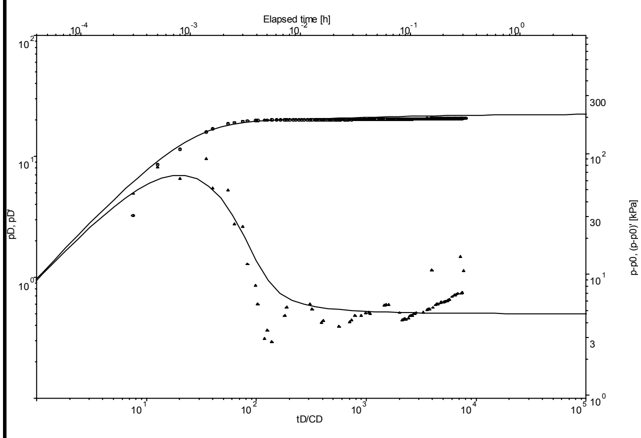
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	1656		
p_i (kPa) =	1648		
p_p(kPa) =	1849	p_F (kPa) =	1651
Q_p (m^3/s)=	4.17E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	9.2		
Derivative fact.=	0.11	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.0E-06		
T_M (m^2/s)=	2.1E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.49	dt_1 (min) =	0.45
dt_2 (min) =	16.72	dt_2 (min) =	9.68
T (m^2/s) =	6.5E-06	T (m^2/s) =	7.2E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.2E-07	K_s (m/s) =	3.6E-07
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.6E-10
C_D (-) =	NA	C_D (-) =	7.2E-02
ξ (-) =	10.9	ξ (-) =	14.0
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA
Selected representative parameters.			
dt_1 (min) =	0.49	C (m^3/Pa) =	6.6E-10
dt_2 (min) =	16.72	C_D (-) =	7.2E-02
T_T (m^2/s) =	6.5E-06	ξ (-) =	10.9
S (-) =	1.0E-06		
K_s (m/s) =	3.3E-07		
S_s (1/m) =	5.0E-08		

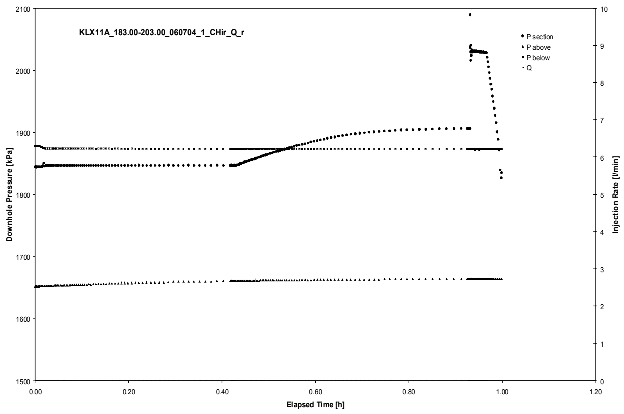
Comments:

The recommended transmissivity of 6.5E-6 m2/s was derived from the radial flow analysis of the CHir phase, because it shows the most clear derivative stabilization. The confidence range for the interval transmissivity is estimated to be 4.0E-6 to 1.0E-5 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,650.5 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060704 17:12
Test section from - to (m):	183.00-203.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	1844		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	9.5		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

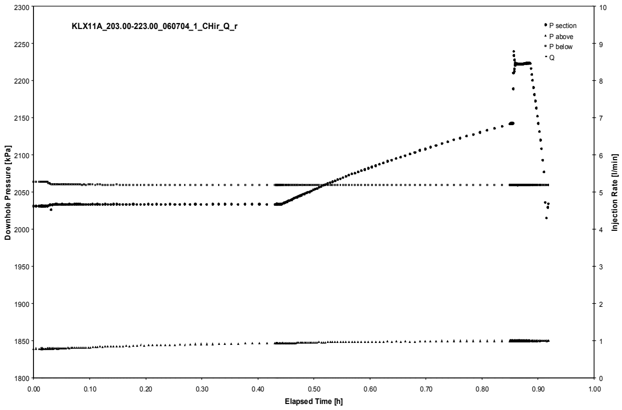
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060704 18:50
Test section from - to (m):	203.00-223.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2031		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	9.8		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

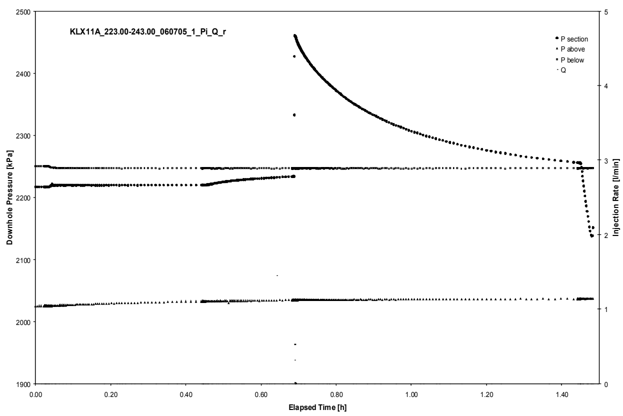
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060705 08:38
Test section from - to (m):	223.00-243.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

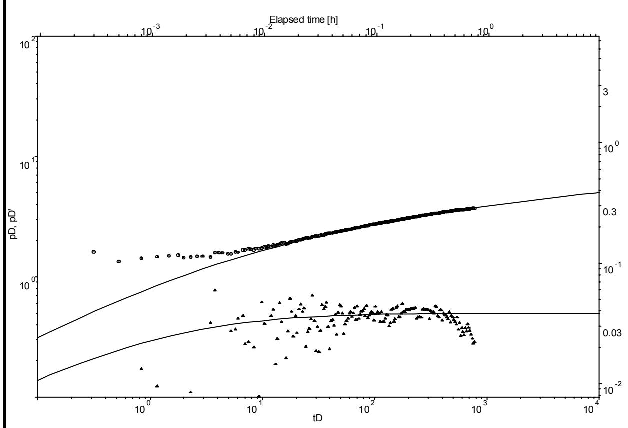


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2216		
p_i (kPa) =	2233		
p_p(kPa) =	2458	p_F (kPa) =	2255
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	2700
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	10.0		
Derivative fact.=	NA	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	1.13
dt_2 (min) =	NA	dt_2 (min) =	22.45
T (m^2/s) =	NA	T (m^2/s) =	3.3E-10
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	1.6E-11
S_s (1/m) =	NA	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.8E-11
C_D (-) =	NA	C_D (-) =	6.4E-03
ξ (-) =	NA	ξ (-) =	0.1
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	8.5E-10
S_{GRF}(-) =	NA	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	NA	D_{GRF} (-) =	1.79

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	1.13	C (m^3/Pa) =	5.8E-11
dt_2 (min) =	22.45	C_D (-) =	6.4E-03
T_T (m^2/s) =	3.3E-10	ξ (-) =	0.1
S (-) =	1.0E-06		
K_s (m/s) =	1.7E-11		
S_s (1/m) =	5.0E-08		

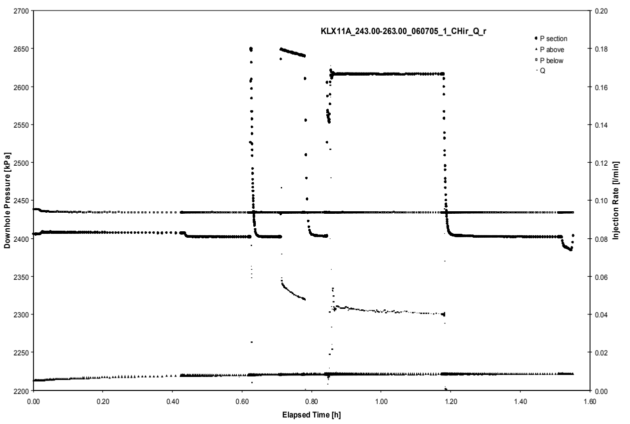
Comments:

The recommended transmissivity of 3.3E-10 m2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 1.0E-10 to 6.0E-10 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

Test Summary Sheet

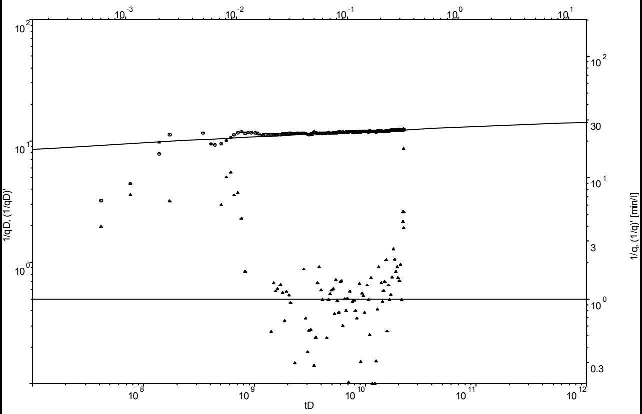
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060705 10:48
Test section from - to (m):	243.00-263.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

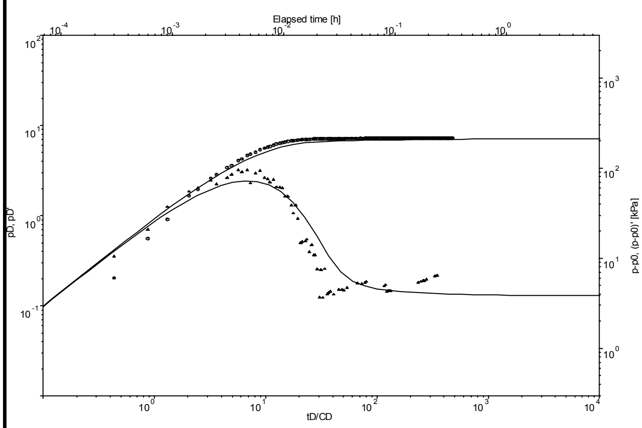


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2406		
p_i (kPa) =	2403		
p_p(kPa) =	2616	p_F (kPa) =	2402
Q_p (m^3/s)=	6.67E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	10.4		
Derivative fact.=	0.08	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	3.1E-08		
T_M (m^2/s)=	3.2E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.85	dt_1 (min) =	NA
dt_2 (min) =	14.54	dt_2 (min) =	NA
T (m^2/s) =	6.1E-08	T (m^2/s) =	3.7E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.0E-09	K_s (m/s) =	1.8E-09
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.9E-11
C_D (-) =	NA	C_D (-) =	6.4E-03
ξ (-) =	6.5	ξ (-) =	4.8
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	5.9E-11
dt_2 (min) =	NA	C_D (-) =	6.4E-03
T_T (m^2/s) =	3.7E-08	ξ (-) =	4.8
S (-) =	1.0E-06		
K_s (m/s) =	1.9E-09		
S_s (1/m) =	5.0E-08		

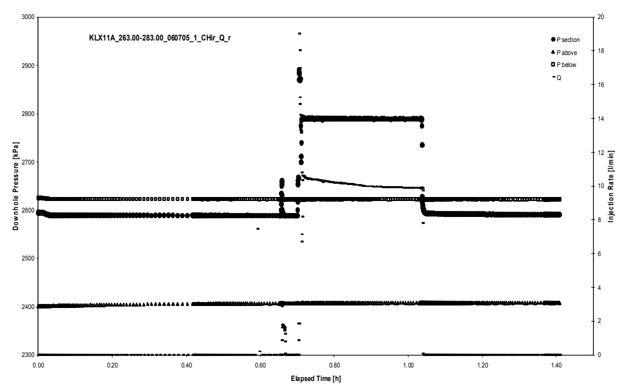
Comments:

The recommended transmissivity of 3.7E-8 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-9 to 8.0E-8 m2/s (this range encompasses the transmissivity of the CHi phase). The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,401.2 kPa.

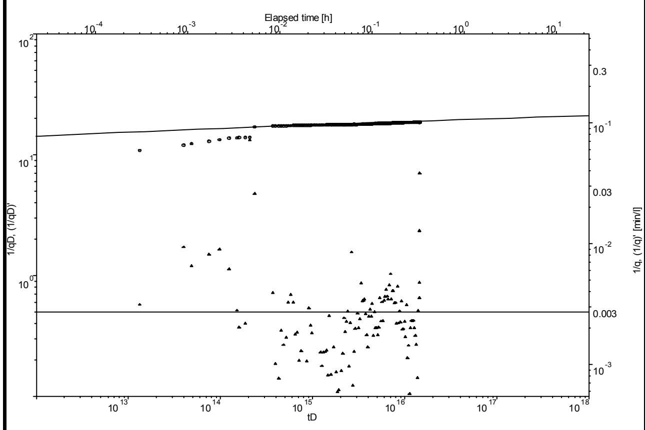
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060705 13:18
Test section from - to (m):	263.00-283.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

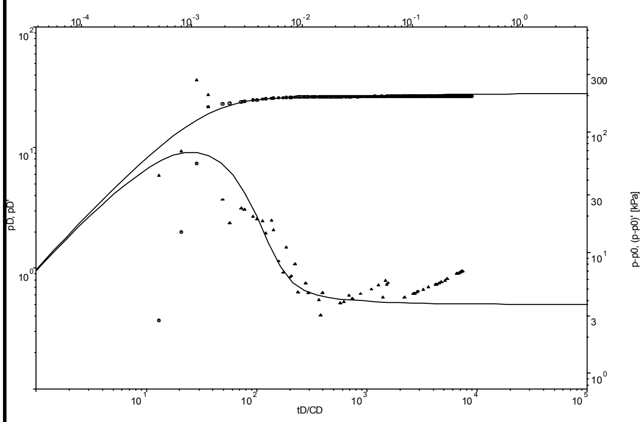
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2594		
p_i (kPa) =	2588		
p_p(kPa) =	2789	p_F (kPa) =	2590
Q_p (m^3/s)=	1.65E-04		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	10.8		
Derivative fact.=	0.02	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	8.1E-06		
T_M (m^2/s)=	8.4E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.28	dt_1 (min) =	0.55
dt_2 (min) =	16.84	dt_2 (min) =	5.08
T (m^2/s) =	2.4E-05	T (m^2/s) =	3.6E-05
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.2E-06	K_s (m/s) =	1.8E-06
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.2E-09
C_D (-) =	NA	C_D (-) =	3.5E-01
ξ (-) =	10.2	ξ (-) =	19.0
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.			
dt_1 (min) =	0.55	C (m^3/Pa) =	3.2E-09
dt_2 (min) =	5.08	C_D (-) =	3.5E-01
T_T (m^2/s) =	3.6E-05	ξ (-) =	19.0
S (-) =	1.0E-06		
K_s (m/s) =	1.8E-06		
S_s (1/m) =	5.0E-08		

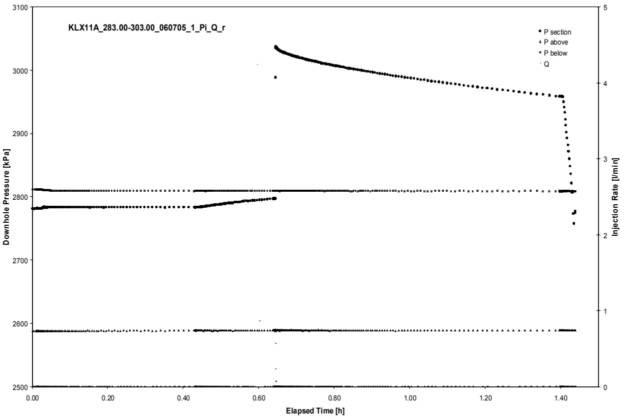
Comments:

The recommended transmissivity of 3.6E-5 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9.0E-6 to 6.0E-5 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,589.2 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060705 15:25
Test section from - to (m):	283.00-303.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

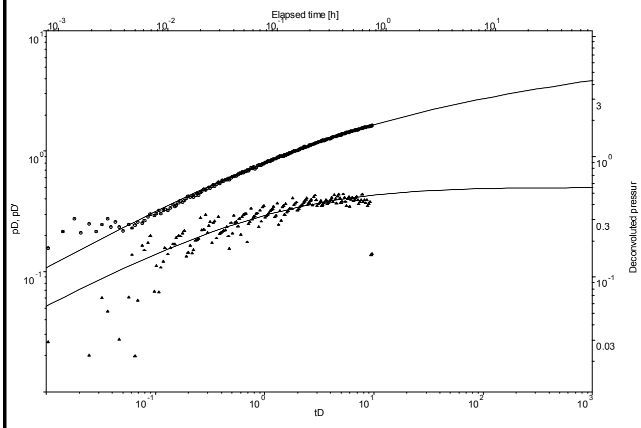


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2781		
p_i (kPa) =	2797		
p_p(kPa) =	3034	p_F (kPa) =	2958
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	2700
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.1		
Derivative fact.=	NA	Derivative fact.=	0.06
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	2.2E-11
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	1.1E-12
S_s (1/m) =	NA	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.6E-11
C_D (-) =	NA	C_D (-) =	6.2E-03
ξ (-) =	NA	ξ (-) =	-0.7
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	1.0E-10
S_{GRF}(-) =	NA	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	NA	D_{GRF} (-) =	1.49

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	5.6E-11
dt_2 (min) =	NA	C_D (-) =	6.2E-03
T_T (m^2/s) =	2.2E-11	ξ (-) =	-0.7
S (-) =	1.0E-06		
K_s (m/s) =	1.1E-12		
S_s (1/m) =	5.0E-08		

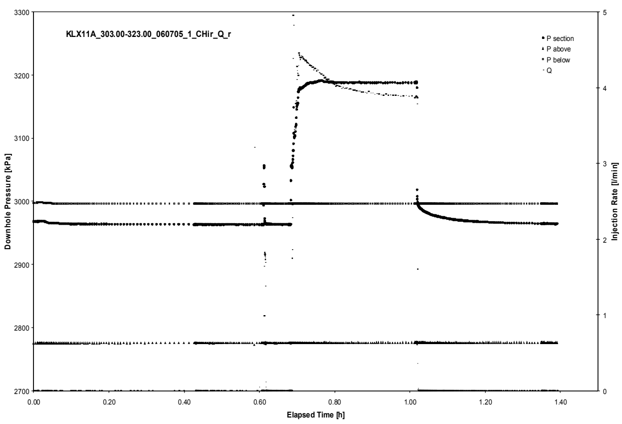
Comments:

The recommended transmissivity of 2.2E-11 m2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 9.0E-12 to 6.0E-11 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

Test Summary Sheet

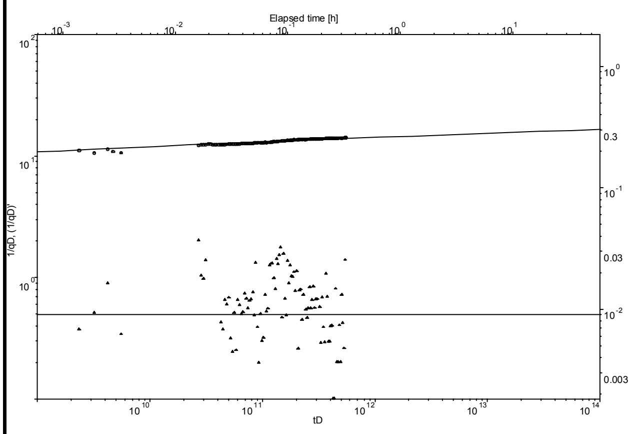
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060705 17:25
Test section from - to (m):	303.00-323.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

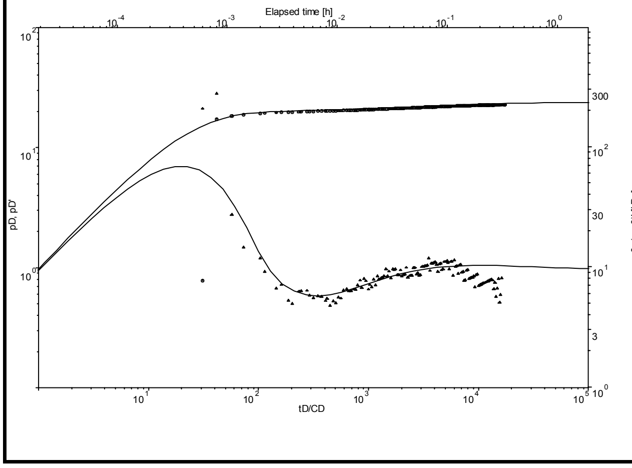


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2967		
p_i (kPa) =	2963		
p_p(kPa) =	3187	p_F (kPa) =	2964
Q_p (m^3/s)=	6.50E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.5		
Derivative fact.=	0.02	Derivative fact.=	0.10
Results		**Results**	
Q/s (m^2/s)=	2.8E-06		
T_M (m^2/s)=	3.0E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.53	dt_1 (min) =	0.31
dt_2 (min) =	18.54	dt_2 (min) =	7.93
T (m^2/s) =	6.4E-06	T (m^2/s) =	5.8E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.2E-07	K_s (m/s) =	2.9E-07
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	4.8E-10
C_D (-) =	NA	C_D (-) =	5.3E-02
ξ (-) =	5.8	ξ (-) =	14.1
T_{GRF}(m^2/s) =	9.7E-07	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	NA
D_{GRF} (-) =	2.3	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0.31	C (m^3/Pa) =	4.8E-10
dt_2 (min) =	7.93	C_D (-) =	5.3E-02
T_T (m^2/s) =	5.8E-06	ξ (-) =	14.1
S (-) =	1.0E-06		
K_s (m/s) =	2.9E-07		
S_s (1/m) =	5.0E-08		

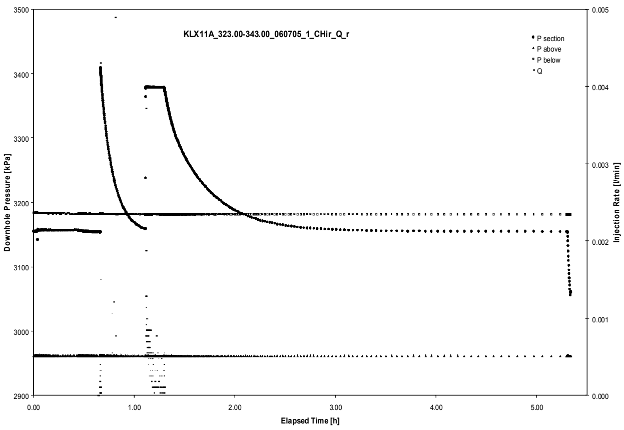
Comments:

The recommended transmissivity of 5.8E-6 m2/s was derived from the radial flow analysis of the CHir phase (outer zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3.0E-6 to 9.0E-6 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,958.2 kPa.

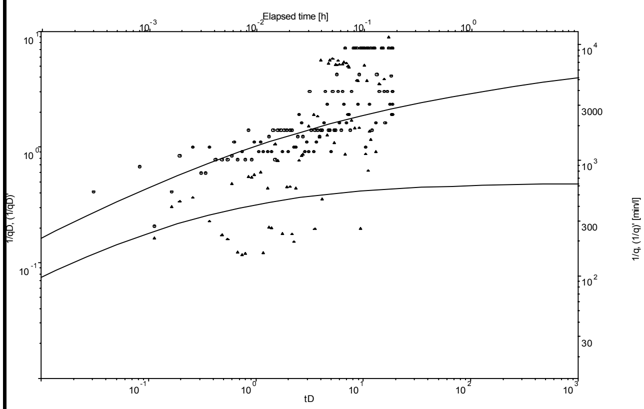
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060705 19:21
Test section from - to (m):	323.00-343.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

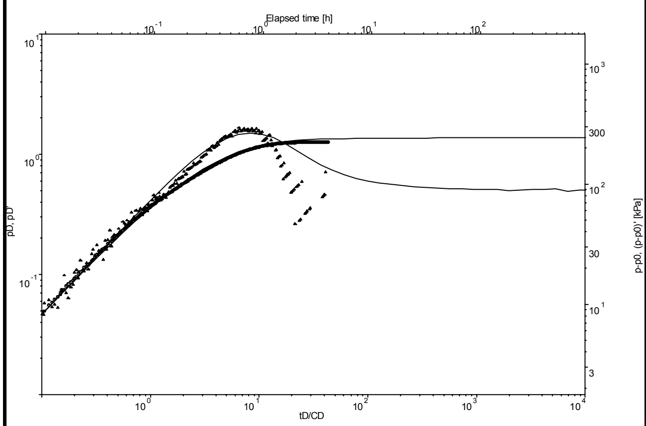
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3155		
p_i (kPa) =	3159		
p_p(kPa) =	3377	p_F (kPa) =	3155
Q_p (m^3/s)=	3.33E-09		
tp (s) =	660	t_F (s) =	14400
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.8		
Derivative fact.=	0.23	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.5E-10		
T_M (m^2/s)=	1.6E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	9.2E-11	T (m^2/s) =	5.5E-11
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	4.6E-12	K_s (m/s) =	2.7E-12
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.2E-11
C_D (-) =	NA	C_D (-) =	1.3E-03
ξ (-) =	-0.4	ξ (-) =	1.0
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	1.2E-11
dt_2 (min) =	NA	C_D (-) =	1.3E-03
T_T (m^2/s) =	5.5E-11	ξ (-) =	1.0
S (-) =	1.0E-06		
K_s (m/s) =	2.8E-12		
S_s (1/m) =	5.0E-08		

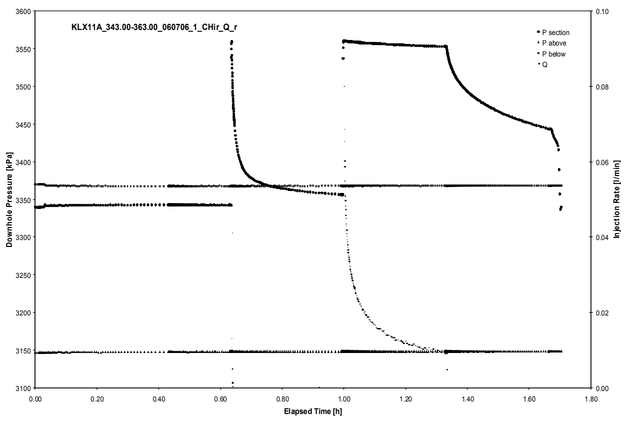
Comments:

The recommended transmissivity of 5.5E-11 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 2.0E-11 to 9.0E-11 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,137.1 kPa.

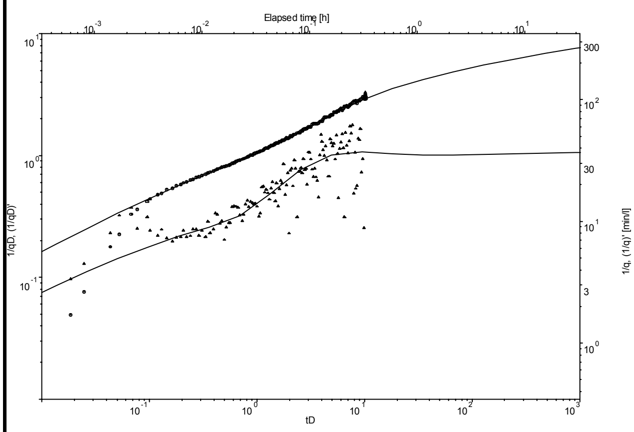
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060706 08:48
Test section from - to (m):	343.00-363.00	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

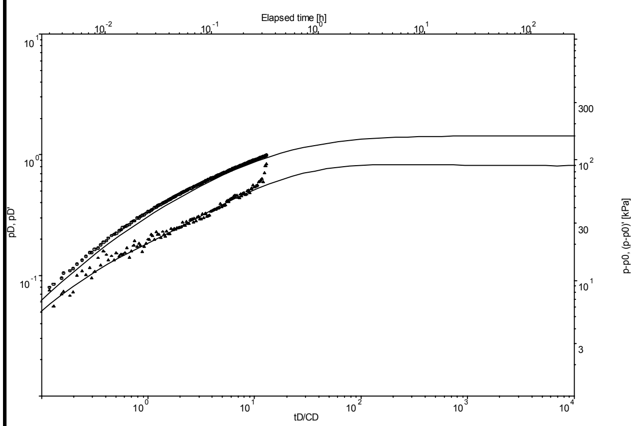
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3339		
p_i (kPa) =	3356		
p_p(kPa) =	3551	p_F (kPa) =	3443
Q_p (m^3/s)=	1.50E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.1		
Derivative fact.=	0.02	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	7.5E-09		
T_M (m^2/s)=	7.9E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	3.9E-09	T (m^2/s) =	4.3E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.9E-10	K_s (m/s) =	2.1E-10
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.5E-10
C_D (-) =	NA	C_D (-) =	2.7E-02
ξ (-) =	-2.9	ξ (-) =	-3.4
T_{GRF}(m^2/s) =	4.0E-09	T_{GRF}(m^2/s) =	4.3E-09
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	1.6	D_{GRF} (-) =	1.6
Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	2.5E-10
dt_2 (min) =	NA	C_D (-) =	2.7E-02
T_T (m^2/s) =	4.3E-09	ξ (-) =	-3.4
S (-) =	1.0E-06		
K_s (m/s) =	2.2E-10		
S_s (1/m) =	5.0E-08		

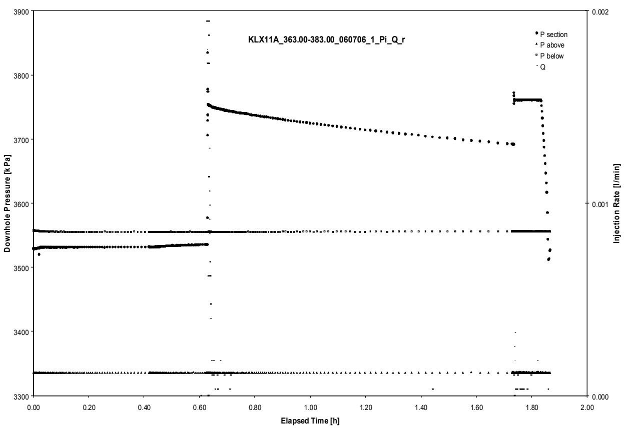
Comments:

The recommended transmissivity of 4.3•10-9 m2/s was derived from the radial flow analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0•10-9 to 8.0•10-9 m2/s. Due to the low transmissivity no fresh water head was calculated.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060706 11:03
Test section from - to (m):	363.00-383.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

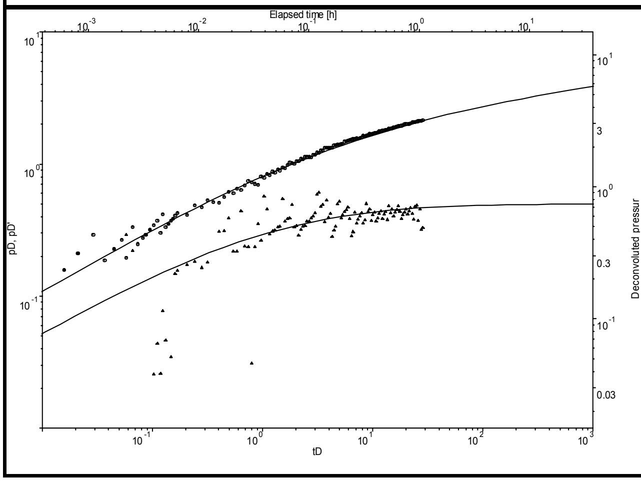


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3530		
p_i (kPa) =	3536		
p_p(kPa) =	3753	p_F (kPa) =	3693
Q_p (m^3/s)=	NA		
tp (s) =	0	t_F (s) =	3968
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.3		
Derivative fact.=	NA	Derivative fact.=	0.06
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	15.64
dt_2 (min) =	NA	dt_2 (min) =	60.85
T (m^2/s) =	NA	T (m^2/s) =	1.1E-11
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	5.3E-13
S_s (1/m) =	NA	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.6E-11
C_D (-) =	NA	C_D (-) =	4.0E-03
ξ (-) =	NA	ξ (-) =	0.0
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	3.2E-11
S_{GRF}(-) =	NA	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	NA	D_{GRF} (-) =	1.75

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	15.64	C (m^3/Pa) =	3.6E-11
dt_2 (min) =	60.85	C_D (-) =	4.0E-03
T_T (m^2/s) =	1.1E-11	ξ (-) =	0.0
S (-) =	1.0E-06		
K_s (m/s) =	5.5E-13		
S_s (1/m) =	5.0E-08		

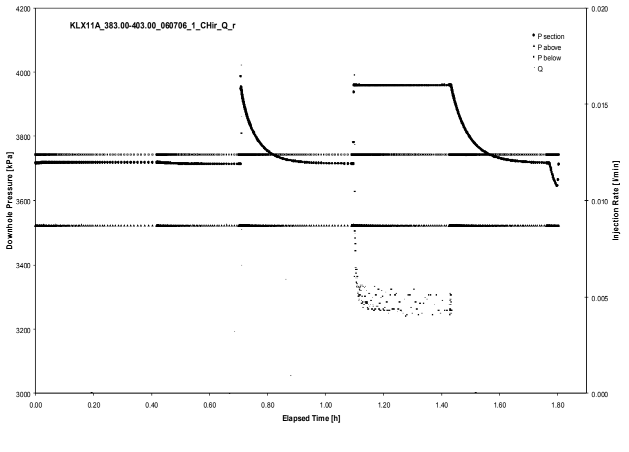
Comments:

The recommended transmissivity of 1.1E-11 m2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be
9.0E-12 to 5.0E-11 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

Test Summary Sheet

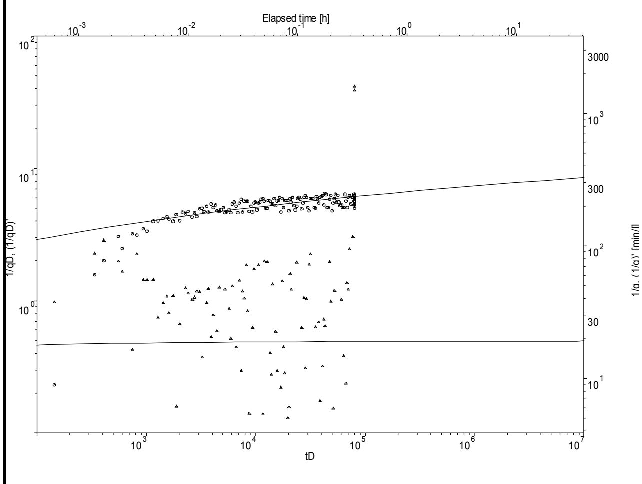
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060706 13:34
Test section from - to (m):	383.00-403.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

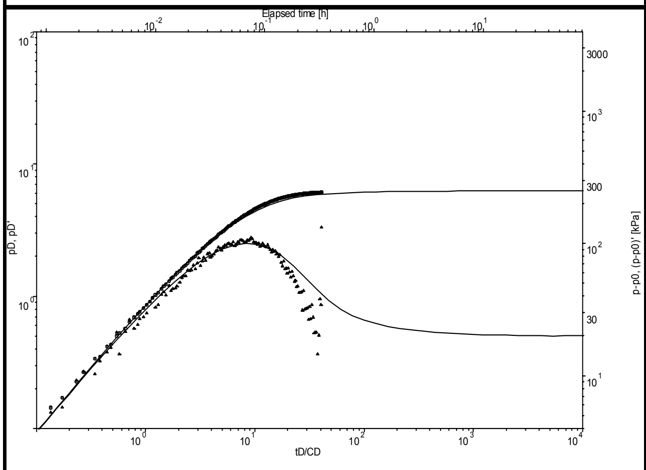


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3717		
p_i (kPa) =	3715		
p_p(kPa) =	3959	p_F (kPa) =	3712
Q_p (m^3/s)=	8.33E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.6		
Derivative fact.=	0.13	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	3.4E-09		
T_M (m^2/s)=	3.5E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.97	dt_1 (min) =	NA
dt_2 (min) =	15.82	dt_2 (min) =	NA
T (m^2/s) =	2.8E-09	T (m^2/s) =	3.3E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.4E-10	K_s (m/s) =	1.6E-10
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.1E-11
C_D (-) =	NA	C_D (-) =	6.8E-03
ξ (-) =	1.8	ξ (-) =	2.5
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	6.1E-11
dt_2 (min) =	NA	C_D (-) =	6.8E-03
T_T (m^2/s) =	3.3E-09	ξ (-) =	2.5
S (-) =	1.0E-06		
K_s (m/s) =	1.7E-10		
S_s (1/m) =	5.0E-08		

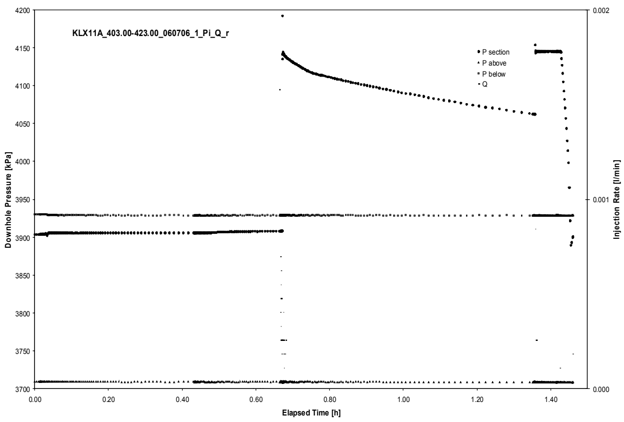
Comments:

The recommended transmissivity of 3.3E-09 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9.0E-10 to 5.0E-09 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,699.9 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060706 15:54
Test section from - to (m):	403.00-423.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

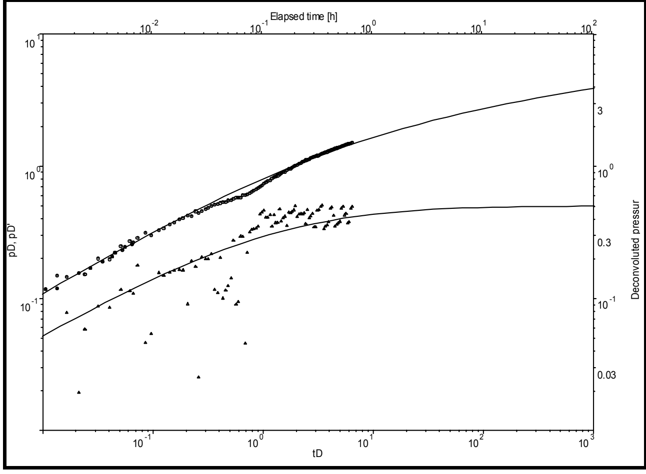


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3903		
p_i (kPa) =	3908		
p_p(kPa) =	4141	p_F (kPa) =	4062
Q_p (m^3/s)=	NA		
tp (s) =	0	t_F (s) =	2458
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.9		
Derivative fact.=	NA	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	2.9E-11
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	1.5E-12
S_s (1/m) =	NA	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.8E-11
C_D (-) =	NA	C_D (-) =	7.5E-03
ξ (-) =	NA	ξ (-) =	-1.0
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	1.8E-10
S_{GRF}(-) =	NA	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	NA	D_{GRF} (-) =	1.45

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	6.8E-11
dt_2 (min) =	NA	C_D (-) =	7.5E-03
T_T (m^2/s) =	2.9E-11	ξ (-) =	-1.0
S (-) =	1.0E-06		
K_s (m/s) =	1.5E-12		
S_s (1/m) =	5.0E-08		

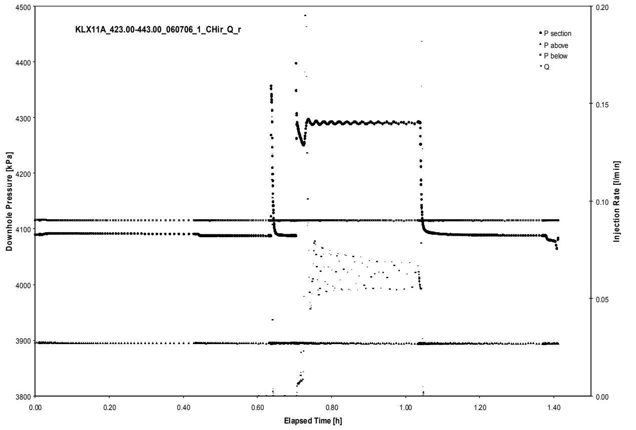
Comments:

The recommended transmissivity of 2.9E-11 m2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 9.0E-12 to 8.0E-11 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

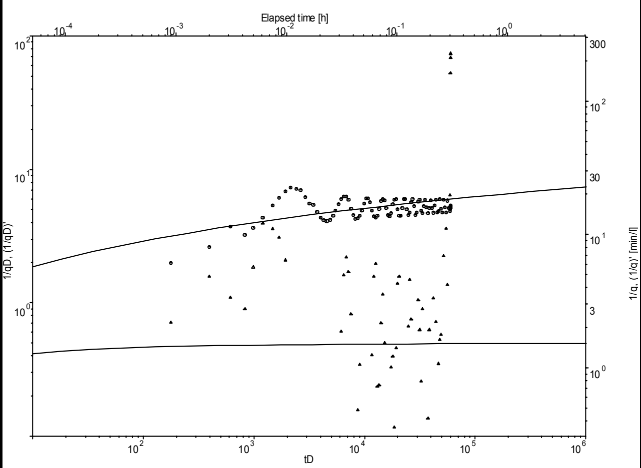
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060706 17:56
Test section from - to (m):	423.00-443.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

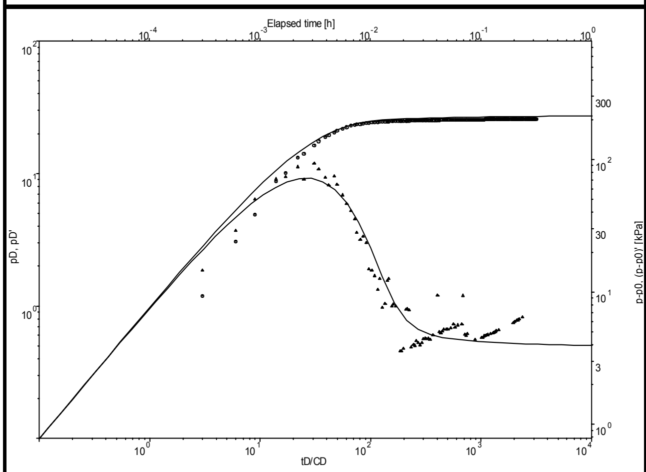
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4090		
p_i (kPa) =	4088		
p_p(kPa) =	4290	p_F (kPa) =	4087
Q_p (m^3/s)=	1.00E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.2		
Derivative fact.=	0.19	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	4.9E-08		
T_M (m^2/s)=	5.1E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	1.40
dt_2 (min) =	NA	dt_2 (min) =	6.06
T (m^2/s) =	4.2E-08	T (m^2/s) =	2.0E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.1E-09	K_s (m/s) =	1.0E-08
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	4.6E-11
C_D (-) =	NA	C_D (-) =	5.1E-03
ξ (-) =	0.3	ξ (-) =	21.1
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.			
dt_1 (min) =	1.40	C (m^3/Pa) =	4.6E-11
dt_2 (min) =	6.06	C_D (-) =	5.1E-03
T_T (m^2/s) =	2.0E-07	ξ (-) =	21.1
S (-) =	1.0E-06		
K_s (m/s) =	1.0E-08		
S_s (1/m) =	5.0E-08		

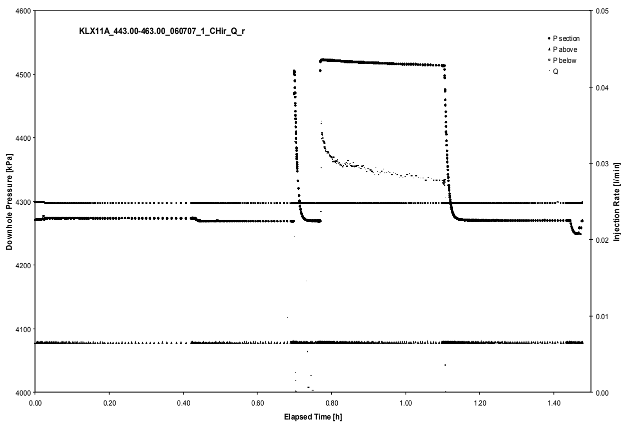
Comments:

The recommended transmissivity of 2.0E-7 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-8 to 6.0E-7 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,086.5 kPa.

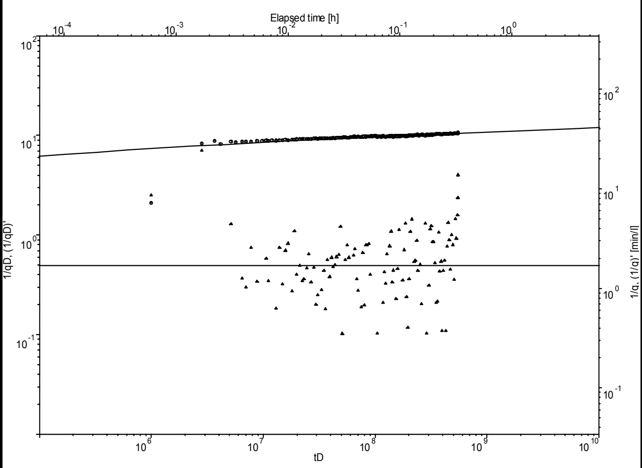
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060707 08:32
Test section from - to (m):	443.00-463.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

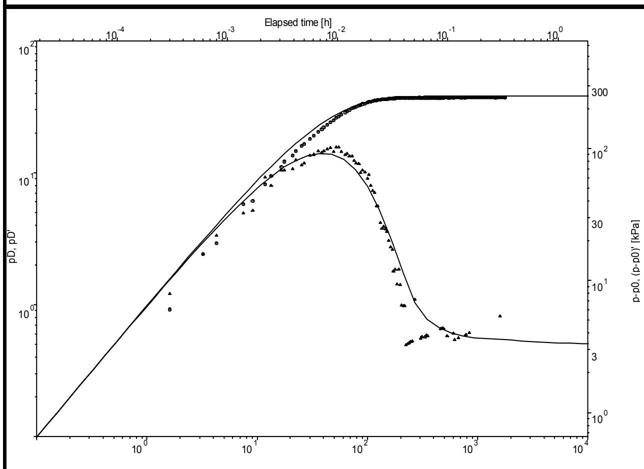
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4271		
p_i (kPa) =	4269		
p_p(kPa) =	4513	p_F (kPa) =	4269
Q_p (m^3/s)=	5.00E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.5		
Derivative fact.=	0.04	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	2.0E-08		
T_M (m^2/s)=	2.1E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.38	dt_1 (min) =	NA
dt_2 (min) =	17.02	dt_2 (min) =	NA
T (m^2/s) =	3.1E-08	T (m^2/s) =	1.2E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.6E-09	K_s (m/s) =	5.9E-09
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.0E-11
C_D (-) =	NA	C_D (-) =	5.6E-03
ξ (-) =	5.0	ξ (-) =	32.5
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.

dt_1 (min) =	0.38	C (m^3/Pa) =	5.0E-11
dt_2 (min) =	17.02	C_D (-) =	5.6E-03
T_T (m^2/s) =	3.1E-08	ξ (-) =	5.0
S (-) =	1.0E-06		
K_s (m/s) =	1.6E-09		
S_s (1/m) =	5.0E-08		

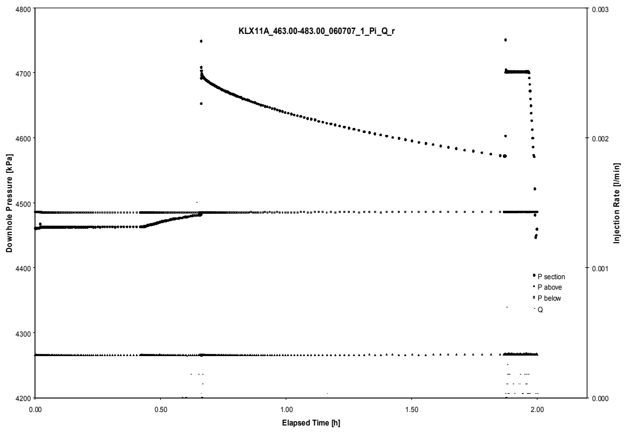
Comments:

The recommended transmissivity of 3.1E-8 m2/s was derived from the radial flow analysis of the CHi phase, which shows a better derivative stabilization. The confidence range for the interval transmissivity is estimated to be 9.0E-9 to 6.0E-8 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,269.7 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060707 10:33
Test section from - to (m):	463.00-483.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

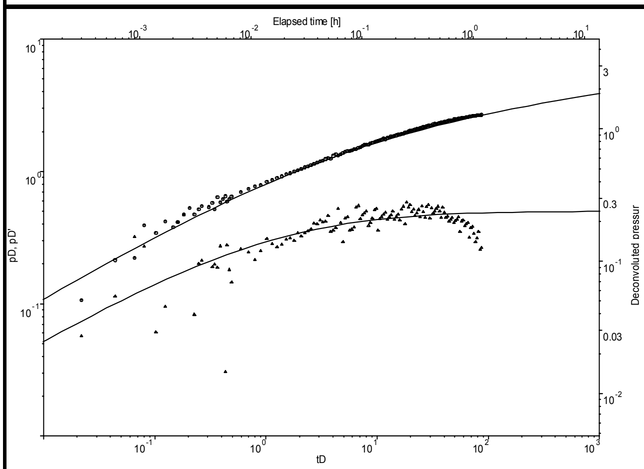


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4461		
p_i (kPa) =	4485		
p_p(kPa) =	4698	p_F (kPa) =	4572
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	4473
S el S* (-)=	1.00E-06	S el S* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.8		
Derivative fact.=	NA	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	9.04
dt_2 (min) =	NA	dt_2 (min) =	32.95
T (m^2/s) =	NA	T (m^2/s) =	5.7E-11
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	2.8E-12
S_s (1/m) =	NA	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.3E-11
C_D (-) =	NA	C_D (-) =	6.9E-03
ξ (-) =	NA	ξ (-) =	-0.3
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	1.6E-10
S_{GRF}(-) =	NA	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	NA	D_{GRF} (-) =	1.7

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	9.04	C (m^3/Pa) =	6.3E-11
dt_2 (min) =	32.95	C_D (-) =	6.9E-03
T_T (m^2/s) =	5.7E-11	ξ (-) =	-0.3
S (-) =	1.0E-06		
K_s (m/s) =	2.9E-12		
S_s (1/m) =	5.0E-08		

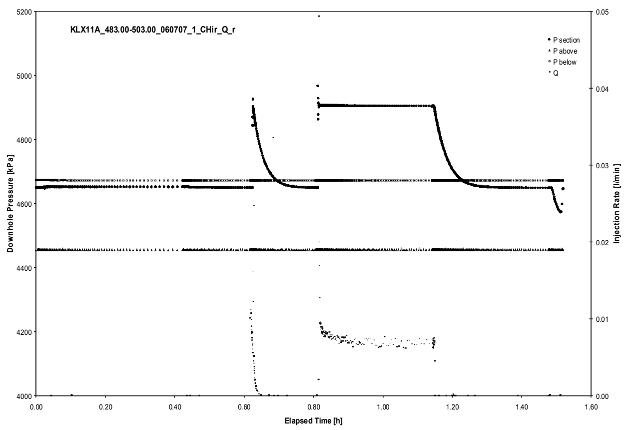
Comments:

The recommended transmissivity of 5.7E-11 m2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 2.0E-11 to 9.0E-11 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

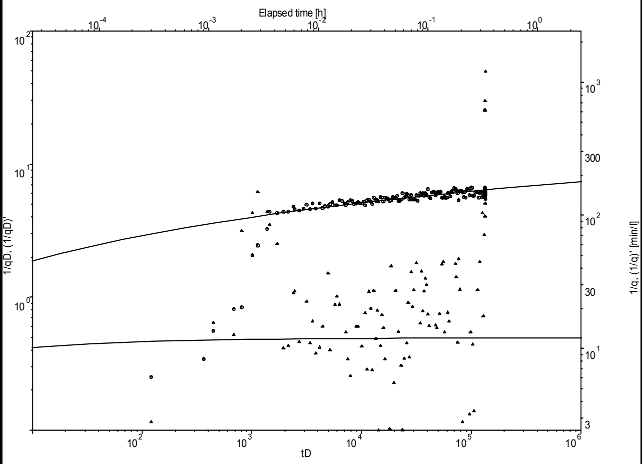
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060707 13:12
Test section from - to (m):	483.00-503.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

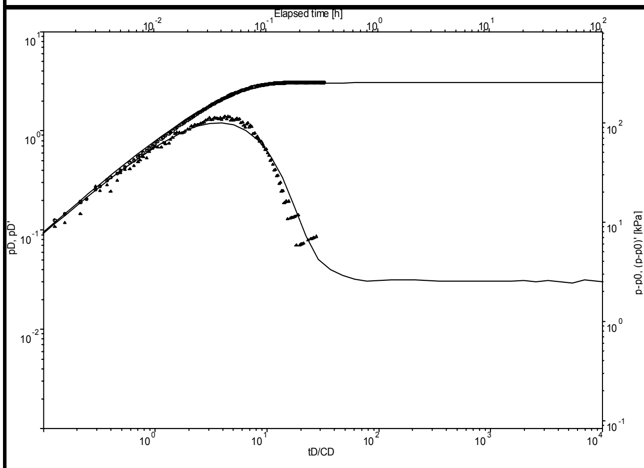
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4650		
p_i (kPa) =	4649		
p_p(kPa) =	4899	p_F (kPa) =	4642
Q_p (m^3/s)=	1.17E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.0		
Derivative fact.=	0.1	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	4.6E-09		
T_M (m^2/s)=	4.8E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.40	dt_1 (min) =	NA
dt_2 (min) =	11.17	dt_2 (min) =	NA
T (m^2/s) =	4.3E-09	T (m^2/s) =	2.5E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.2E-10	K_s (m/s) =	1.3E-10
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.0E-11
C_D (-) =	NA	C_D (-) =	6.6E-03
ξ (-) =	1.8	ξ (-) =	0.2
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	6.0E-11
dt_2 (min) =	NA	C_D (-) =	6.6E-03
T_T (m^2/s) =	2.5E-09	ξ (-) =	0.2
S (-) =	1.0E-06		
K_s (m/s) =	1.3E-10		
S_s (1/m) =	5.0E-08		

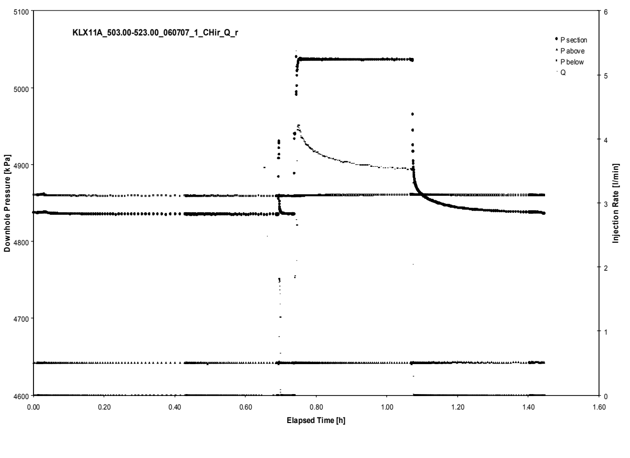
Comments:

The recommended transmissivity of 2.5E-9 m2/s was derived from the radial flow analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9.0E-10 to 5.0E-09 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,645.5 kPa.

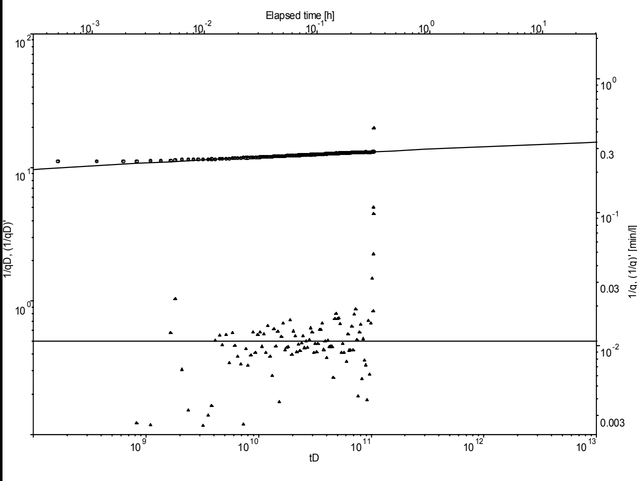
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060707 15:12
Test section from - to (m):	503.00-523.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

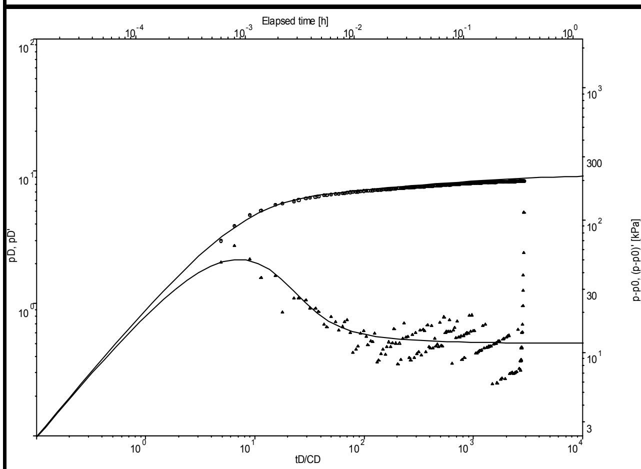
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4838		
p_i (kPa) =	4837		
p_p(kPa) =	5037	p_F (kPa) =	4838
Q_p (m^3/s)=	5.83E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.4		
Derivative fact.=	0.04	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.9E-06		
T_M (m^2/s)=	3.0E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.86	dt_1 (min) =	0.92
dt_2 (min) =	15.43	dt_2 (min) =	14.08
T (m^2/s) =	6.0E-06	T (m^2/s) =	4.1E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.0E-07	K_s (m/s) =	2.1E-07
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.2E-09
C_D (-) =	NA	C_D (-) =	1.3E-01
ξ (-) =	5.0	ξ (-) =	1.0
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.			
dt_1 (min) =	0.92	C (m^3/Pa) =	1.2E-09
dt_2 (min) =	14.08	C_D (-) =	1.3E-01
T_T (m^2/s) =	4.1E-06	ξ (-) =	1.0
S (-) =	1.0E-06		
K_s (m/s) =	2.1E-07		
S_s (1/m) =	5.0E-08		

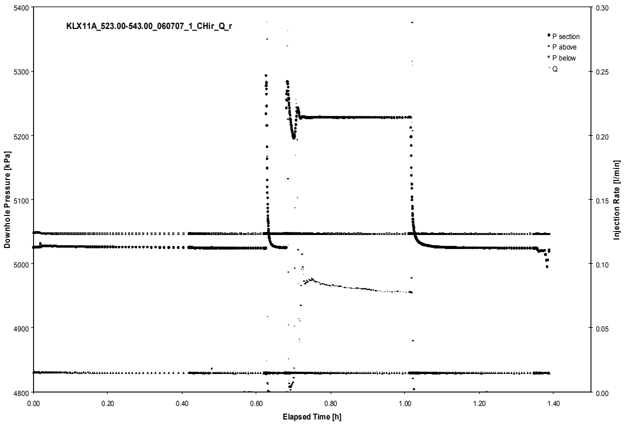
Comments:

The recommended transmissivity of 4.1E-6 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-6 to 7.0E-6 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,830.4 kPa.

Test Summary Sheet

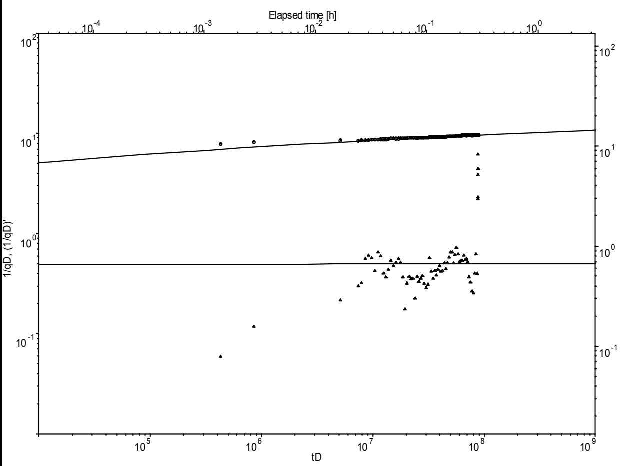
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060707 17:07
Test section from - to (m):	523.00-543.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

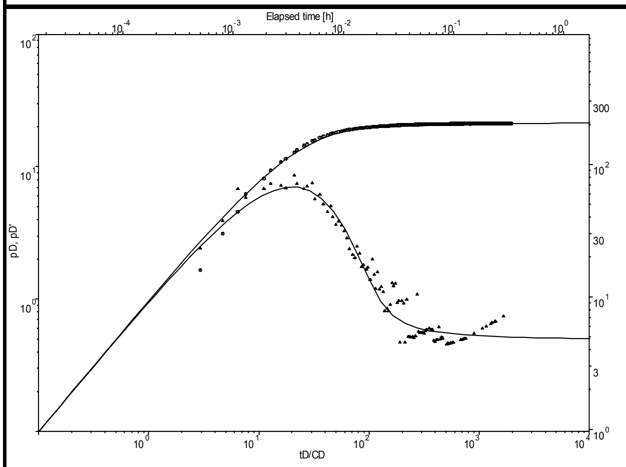


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5025		
p_i (kPa) =	5024		
p_p(kPa) =	5228	p_F (kPa) =	5023
Q_p (m^3/s)=	1.33E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.6		
Derivative fact.=	0.1	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	6.4E-08		
T_M (m^2/s)=	6.7E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2.05	dt_1 (min) =	2.40
dt_2 (min) =	14.05	dt_2 (min) =	9.23
T (m^2/s) =	9.6E-08	T (m^2/s) =	2.2E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	4.8E-09	K_s (m/s) =	1.1E-08
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	8.5E-11
C_D (-) =	NA	C_D (-) =	9.4E-03
ξ (-) =	3.6	ξ (-) =	15.0
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	2.40	C (m^3/Pa) =	8.5E-11
dt_2 (min) =	9.23	C_D (-) =	9.4E-03
T_T (m^2/s) =	2.2E-07	ξ (-) =	15.0
S (-) =	1.0E-06		
K_s (m/s) =	1.1E-08		
S_s (1/m) =	5.0E-08		

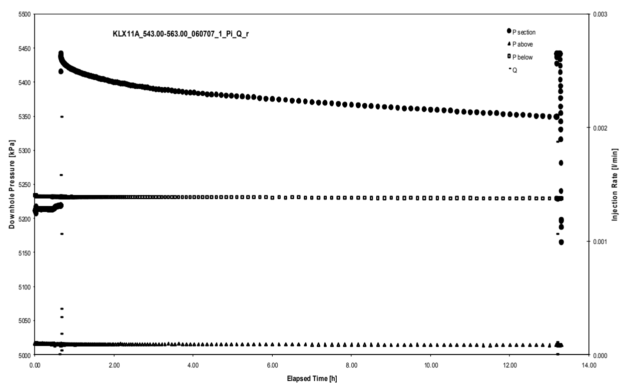
Comments:

The recommended transmissivity of 2.2•E-7 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-8 to 6.0E-7 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,023.2 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060707 19:07
Test section from - to (m):	543.00-563.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

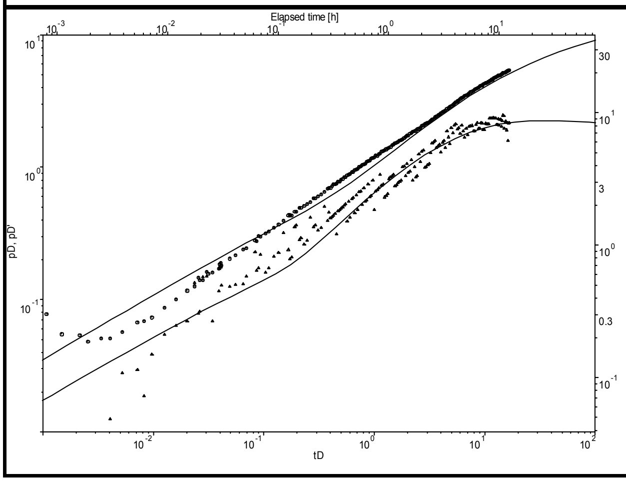


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5211		
p_i (kPa) =	5219		
p_p(kPa) =	5439	p_F (kPa) =	5349
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	45360
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.0		
Derivative fact.=	NA	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	1.2E-12
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	6.1E-14
S_s (1/m) =	NA	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.1E-11
C_D (-) =	NA	C_D (-) =	1.2E-03
ξ (-) =	NA	ξ (-) =	-0.4
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	1.7E-11
S_{GRF}(-) =	NA	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	NA	D_{GRF} (-) =	1.0

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	1.1E-11
dt_2 (min) =	NA	C_D (-) =	1.2E-03
T_T (m^2/s) =	1.2E-12	ξ (-) =	-0.4
S (-) =	1.0E-06		
K_s (m/s) =	6.0E-14		
S_s (1/m) =	5.0E-08		

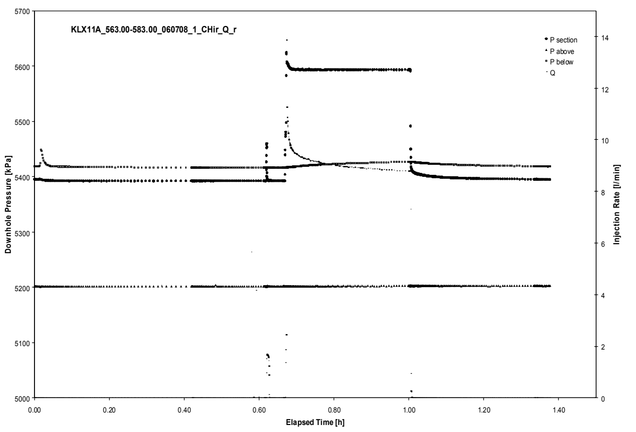
Comments:

The recommended transmissivity of 1.2E-12 m2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 7.0E-13 to 4.0E-12 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

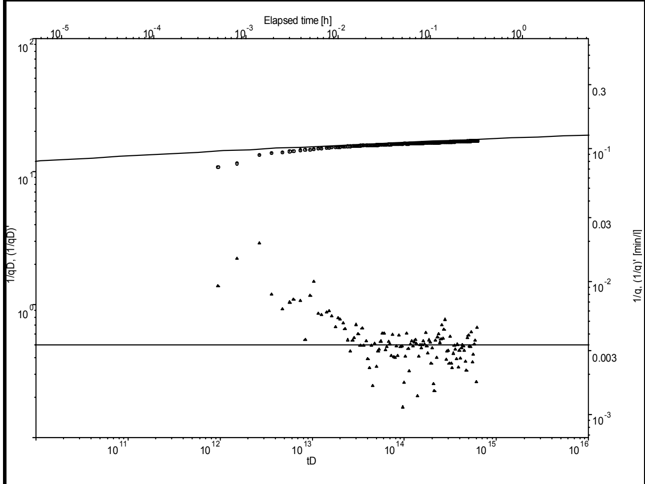
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060708 08:58
Test section from - to (m):	563.00-583.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

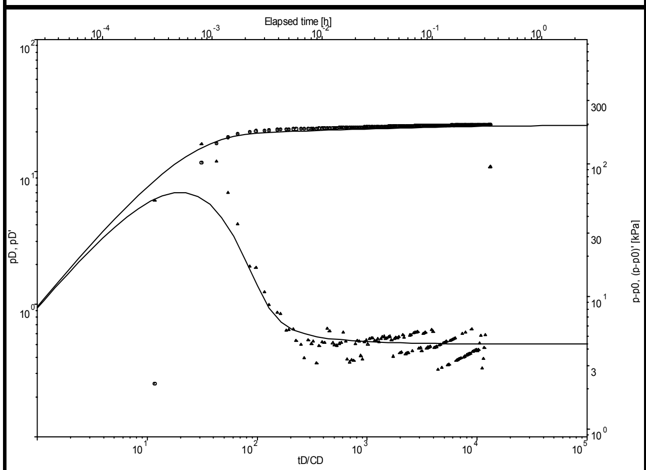
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5395		
p_i (kPa) =	5392		
p_p(kPa) =	5590	p_F (kPa) =	5394
Q_p (m^3/s)=	1.47E-04		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.1		
Derivative fact.=	0.05	Derivative fact.=	0.1
Results		**Results**	
Q/s (m^2/s)=	7.3E-06		
T_M (m^2/s)=	7.6E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.86	dt_1 (min) =	0.45
dt_2 (min) =	18.55	dt_2 (min) =	17.96
T (m^2/s) =	2.0E-05	T (m^2/s) =	2.7E-05
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	9.8E-07	K_s (m/s) =	1.4E-06
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.6E-09
C_D (-) =	NA	C_D (-) =	1.8E-01
ξ (-) =	8.7	ξ (-) =	13.5
T_{GRF}(m^2/s) =	7.0E-06	T_{GRF}(m^2/s) =	8.2E-06
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	2.1	D_{GRF} (-) =	2.1

Selected representative parameters.

dt_1 (min) =	0.45	C (m^3/Pa) =	1.6E-09
dt_2 (min) =	17.96	C_D (-) =	1.8E-01
T_T (m^2/s) =	2.7E-05	ξ (-) =	13.5
S (-) =	1.0E-06		
K_s (m/s) =	1.4E-06		
S_s (1/m) =	5.0E-08		

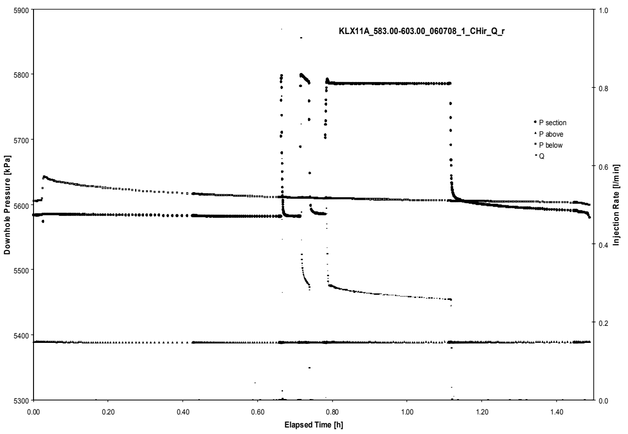
Comments:

The recommended transmissivity of 2.7E-5 m2/s was derived from the radial flow analysis of the CHi phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9.0E-6 to 5.0E-5 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,392.3 kPa.

Test Summary Sheet

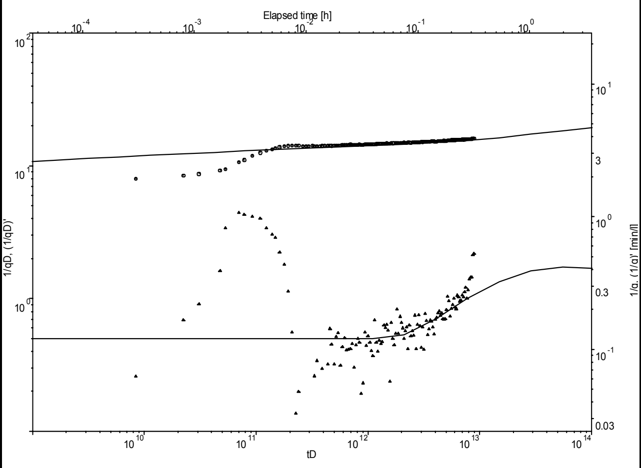
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060708 10:53
Test section from - to (m):	583.00-603.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

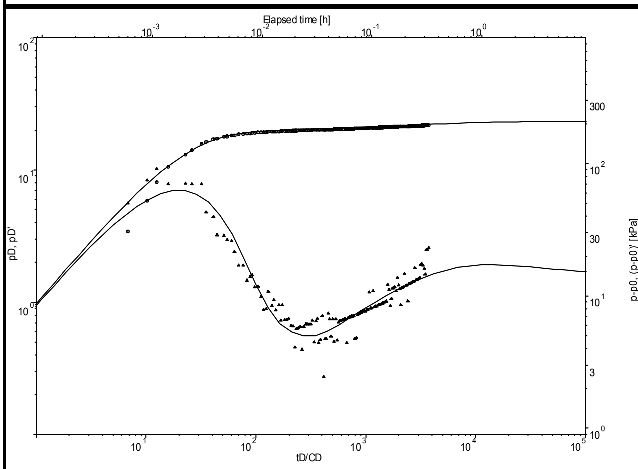


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5583		
p_i (kPa) =	5585		
p_p(kPa) =	5786	p_F (kPa) =	5590
Q_p (m^3/s)=	4.33E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.6		
Derivative fact.=	0.1	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	2.1E-07		
T_M (m^2/s)=	2.2E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.01	dt_1 (min) =	NA
dt_2 (min) =	4.52	dt_2 (min) =	NA
T (m^2/s) =	5.4E-07	T (m^2/s) =	7.9E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.7E-08	K_s (m/s) =	4.0E-08
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.6E-10
C_D (-) =	NA	C_D (-) =	1.8E-02
ξ (-) =	8.4	ξ (-) =	14.7
T_{GRF}(m^2/s) =	5.4E-07	T_{GRF}(m^2/s) =	7.9E-07
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	1.9	D_{GRF} (-) =	1.95

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	1.6E-10
dt_2 (min) =	NA	C_D (-) =	1.8E-02
T_T (m^2/s) =	7.9E-07	ξ (-) =	14.7
S (-) =	1.0E-06		
K_s (m/s) =	4.0E-08		
S_s (1/m) =	5.0E-08		

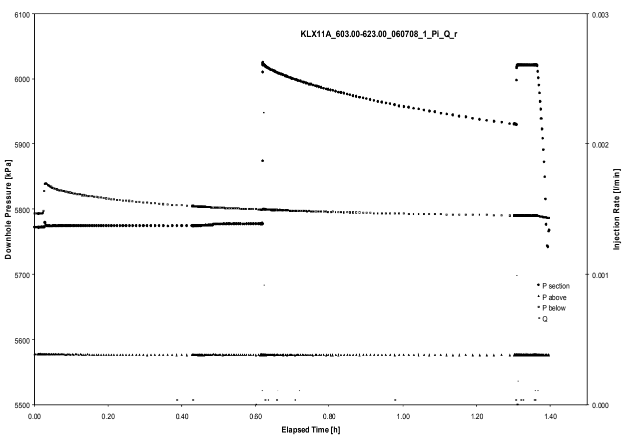
Comments:

The recommended transmissivity of 7.9E-7 m2/s was derived from the radial flow analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5.0E-7 to 1.0E-6 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,581.5 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060708 13:17
Test section from - to (m):	603.00-623.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

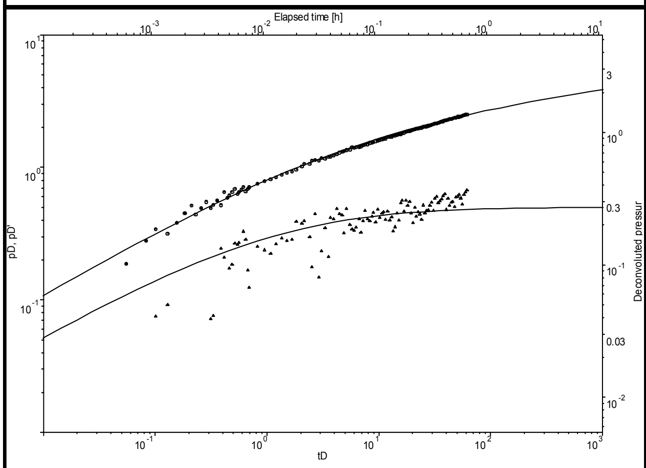
Linear plot Q and p



Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5772		
p_i (kPa) =	5778		
p_p(kPa) =	6021	p_F (kPa) =	5930
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	2460
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.9		
Derivative fact.=	NA	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	2.90
dt_2 (min) =	NA	dt_2 (min) =	35.22
T (m^2/s) =	NA	T (m^2/s) =	4.4E-11
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	2.2E-12
S_s (1/m) =	NA	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.5E-11
C_D (-) =	NA	C_D (-) =	6.1E-03
ξ (-) =	NA	ξ (-) =	-0.1
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	1.0E-09
S_{GRF}(-) =	NA	S_{GRF}(-) =	1.0E+06
D_{GRF} (-) =	NA	D_{GRF} (-) =	1.5

Selected representative parameters.

dt_1 (min) =	2.90	C (m^3/Pa) =	5.5E-11
dt_2 (min) =	35.22	C_D (-) =	6.1E-03
T_T (m^2/s) =	4.4E-11	ξ (-) =	-0.1
S (-) =	1.0E-06		
K_s (m/s) =	2.2E-12		
S_s (1/m) =	5.0E-08		

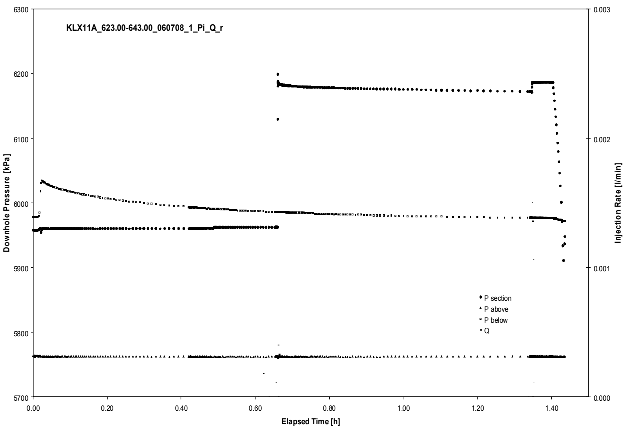
Comments:

The recommended transmissivity of 4.4•10-11 m2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 1.0•10-11 to 9.0•10-11 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060708 15:12
Test section from - to (m):	623.00-643.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

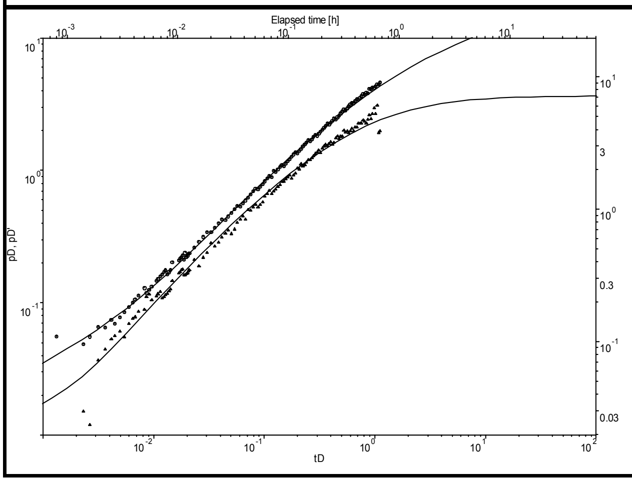


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5957		
p_i (kPa) =	5963		
p_p(kPa) =	6183	p_F (kPa) =	6172
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	2460
S el S* (-)=	1.00E-06	S el S* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16.2		
Derivative fact.=	NA	Derivative fact.=	0.23
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	1.3E-11
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	6.6E-13
S_s (1/m) =	NA	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.0E-11
C_D (-) =	NA	C_D (-) =	6.6E-03
ξ (-) =	NA	ξ (-) =	-1.5
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	6.0E-11
dt_2 (min) =	NA	C_D (-) =	6.6E-03
T_T (m^2/s) =	1.3E-11	ξ (-) =	-1.5
S (-) =	1.0E-06		
K_s (m/s) =	6.5E-13		
S_s (1/m) =	5.0E-08		

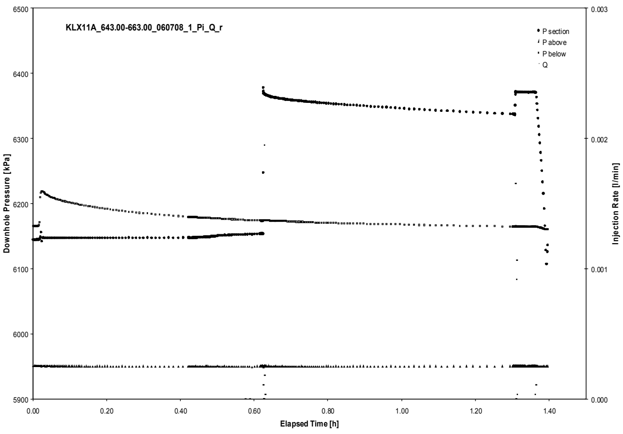
Comments:

The recommended transmissivity of 1.3E-11 m2/s was derived from the radial flow analysis of the PI phase (inner zone). The confidence range for the interval transmissivity is estimated to be 9.0E-12 to 4.0E-11 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	PI
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060708 17:10
Test section from - to (m):	643.00-663.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

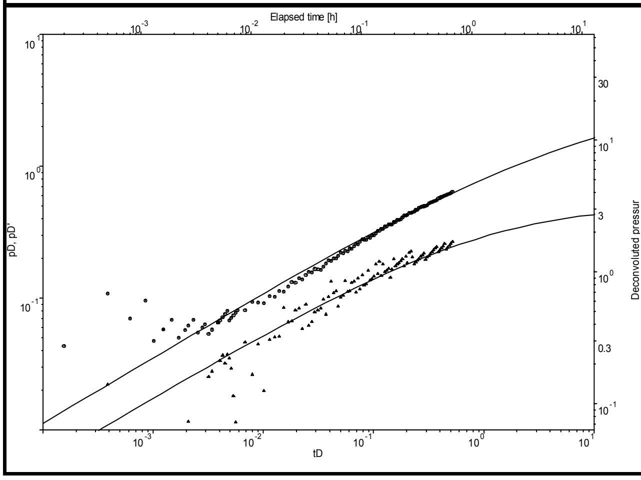


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6144		
p_i (kPa) =	6153		
p_p(kPa) =	6368	p_F (kPa) =	6133
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	2400
S el S* (-)=	1.00E-06	S el S* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16.5		
Derivative fact.=	NA	Derivative fact.=	0.08
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	2.1E-12
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	1.1E-13
S_s (1/m) =	NA	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.1E-11
C_D (-) =	NA	C_D (-) =	3.4E-03
ξ (-) =	NA	ξ (-) =	-1.0
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	5.3E-12
S_{GRF}(-) =	NA	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	NA	D_{GRF} (-) =	1.6

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	3.1E-11
dt_2 (min) =	NA	C_D (-) =	3.4E-03
T_T (m^2/s) =	2.1E-12	ξ (-) =	-1.0
S (-) =	1.0E-06		
K_s (m/s) =	1.1E-13		
S_s (1/m) =	5.0E-08		

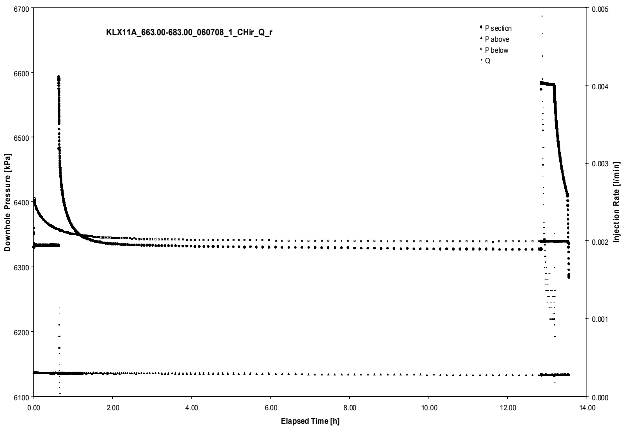
Comments:

The recommended transmissivity of 2.1E-12 m2/s was derived from the radial flow analysis of the PI phase. The confidence range for the interval transmissivity is estimated to be 9.0E-13 to 6.0E-12 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

Test Summary Sheet

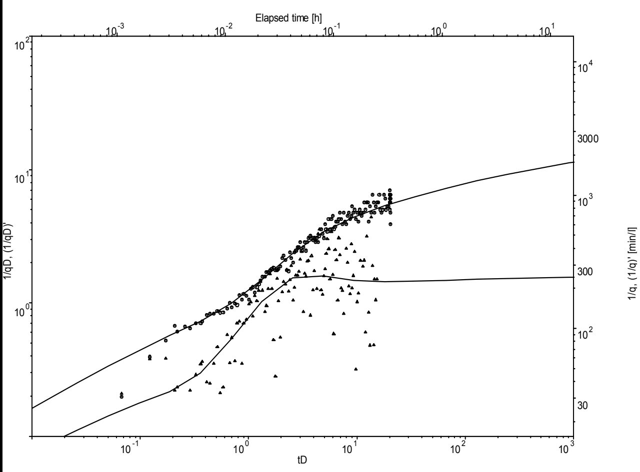
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060708 19:06
Test section from - to (m):	663.00-683.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

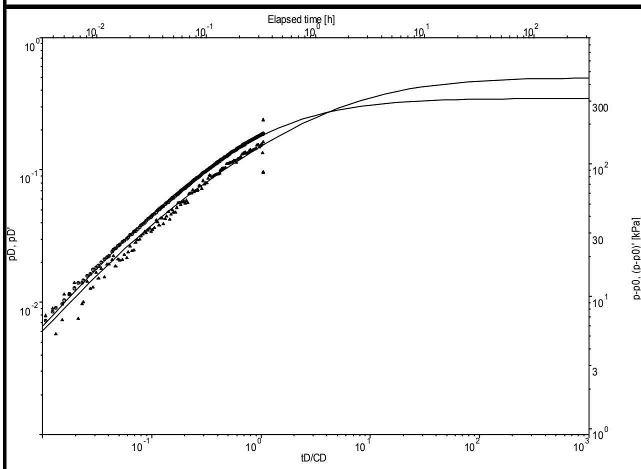


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6332		
p_i (kPa) =	6327		
p_p(kPa) =	6583	p_F (kPa) =	6411
Q_p (m^3/s)=	1.67E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16.8		
Derivative fact.=	0.11	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	6.4E-10		
T_M (m^2/s)=	6.7E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2.68	dt_1 (min) =	NA
dt_2 (min) =	15.04	dt_2 (min) =	NA
T (m^2/s) =	2.0E-10	T (m^2/s) =	6.3E-11
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.0E-11	K_s (m/s) =	3.2E-12
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	4.6E-11
C_D (-) =	NA	C_D (-) =	5.1E-03
ξ (-) =	-1.6	ξ (-) =	-2.6
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	2.68	C (m^3/Pa) =	4.6E-11
dt_2 (min) =	15.04	C_D (-) =	5.1E-03
T_T (m^2/s) =	2.0E-10	ξ (-) =	-1.6
S (-) =	1.0E-06		
K_s (m/s) =	1.0E-11		
S_s (1/m) =	5.0E-08		

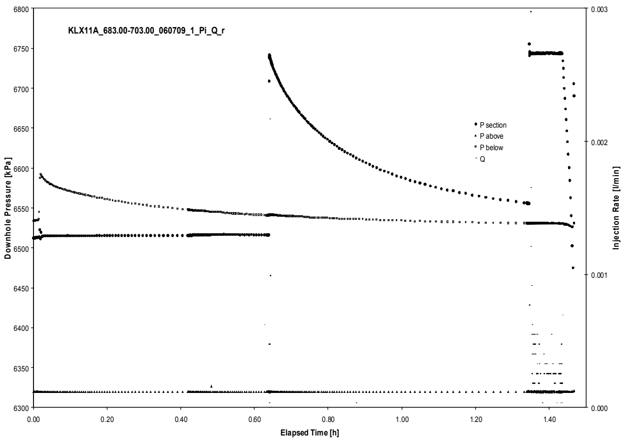
Comments:

The recommended transmissivity of 2.0E-10 m2/s was derived from the radial flow analysis of the CHi phase (outer zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9.0E-11 to 7.0E-10 m2/s (this range includes the transmissivity derived from the inner zone transmissivity the CHi phase). The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 6,317.5 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060709 09:11
Test section from - to (m):	683.00-703.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

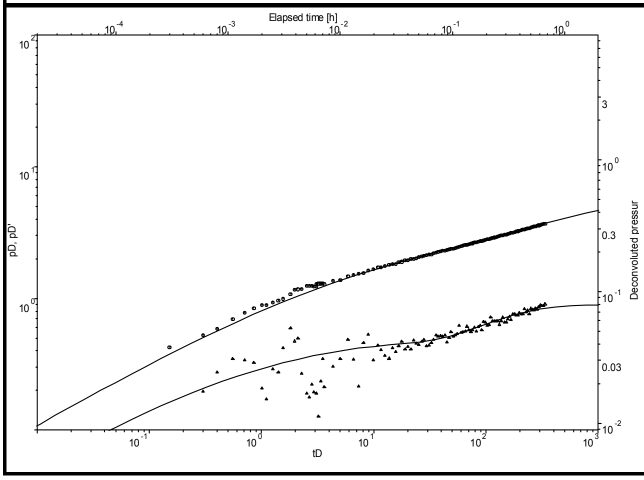


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6513		
p_i (kPa) =	6516		
p_p(kPa) =	6740	p_F (kPa) =	6556
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	2520
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	17.1		
Derivative fact.=	NA	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	1.5E-10
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	7.5E-12
S_s (1/m) =	NA	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.3E-11
C_D (-) =	NA	C_D (-) =	5.9E-03
ξ (-) =	NA	ξ (-) =	-0.1
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	2.6E-10
S_{GRF}(-) =	NA	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	NA	D_{GRF} (-) =	1.87

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	5.3E-11
dt_2 (min) =	NA	C_D (-) =	5.9E-03
T_T (m^2/s) =	1.5E-10	ξ (-) =	-0.1
S (-) =	1.0E-06		
K_s (m/s) =	7.5E-12		
S_s (1/m) =	5.0E-08		

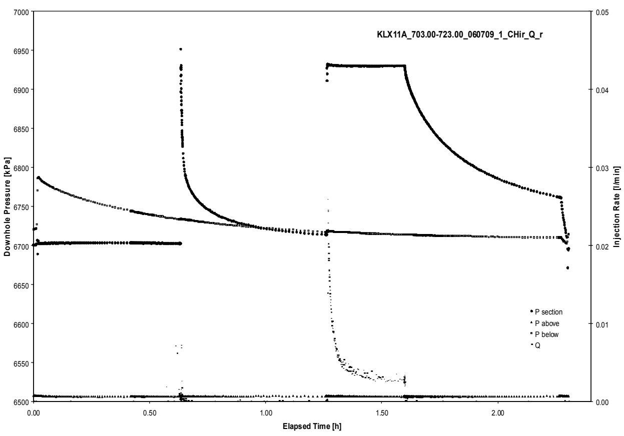
Comments:

The recommended transmissivity of 1.5•10-10 m2/s was derived from the radial flow analysis of the Pi phase (outer zone). The confidence range for the interval transmissivity is estimated to be 6.0E-11 to 3.0E-10 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

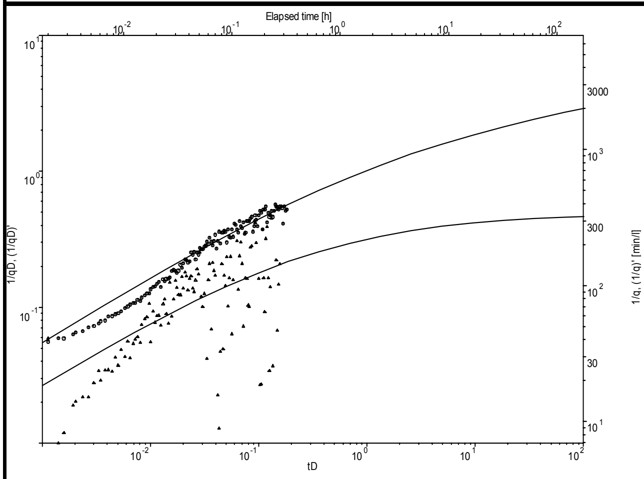
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060709 11:08
Test section from - to (m):	703.00-723.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

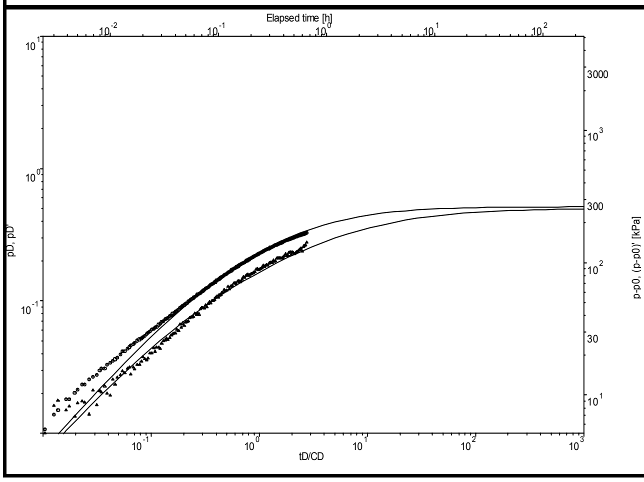
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6700		
p_i (kPa) =	6718		
p_p(kPa) =	6928	p_F (kPa) =	6761
Q_p (m^3/s)=	5.00E-08		
tp (s) =	1200	t_F (s) =	2400
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	17.3		
Derivative fact.=	0.08	Derivative fact.=	0.07
Results		**Results**	
Q/s (m^2/s)=	2.3E-09		
T_M (m^2/s)=	2.4E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	1.9E-10	T (m^2/s) =	2.6E-10
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	9.3E-12	K_s (m/s) =	1.3E-11
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.4E-10
C_D (-) =	NA	C_D (-) =	1.6E-02
ξ (-) =	-3.4	ξ (-) =	-3.1
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	1.4E-10
dt_2 (min) =	NA	C_D (-) =	1.6E-02
T_T (m^2/s) =	2.6E-10	ξ (-) =	-3.1
S (-) =	1.0E-06		
K_s (m/s) =	1.3E-11		
S_s (1/m) =	5.0E-08		

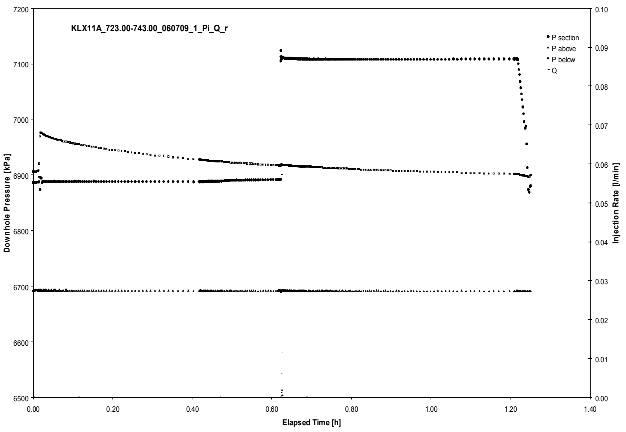
Comments:

The recommended transmissivity of 2.6E-10 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9.0E-11 to 6.0E-10 m2/s. Due to the low transmissivity no fresh water head was calculated.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060709 13:58
Test section from - to (m):	723.00-743.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	6886		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	17.6		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

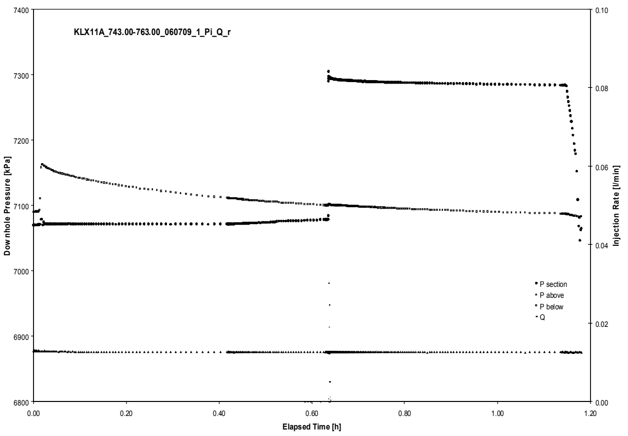
Comments:

Based on the test response the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060709 15:45
Test section from - to (m):	743.00-763.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	7070		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	17.9		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

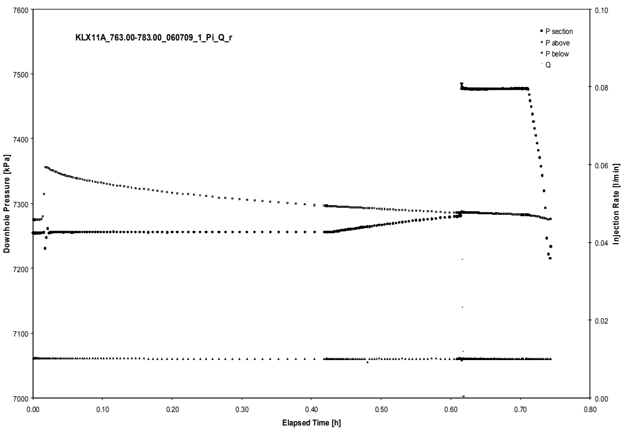
Comments:

Based on the test response the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060709 17:25
Test section from - to (m):	763.00-783.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	7254		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	18.2		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =		ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

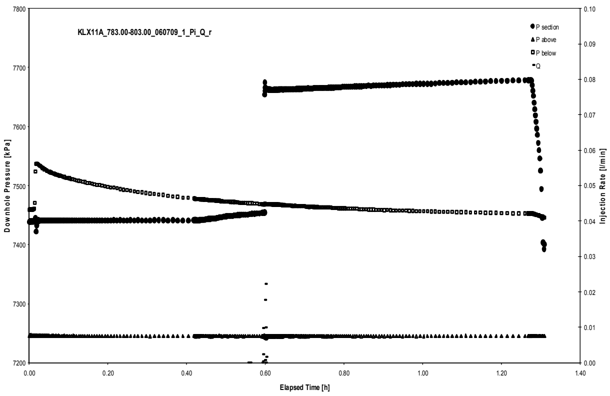
Comments:

Based on the test response the interval transmissivity is lower than 1.0•10-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060709 18:43
Test section from - to (m):	783.00-803.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	7439		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	18.5		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

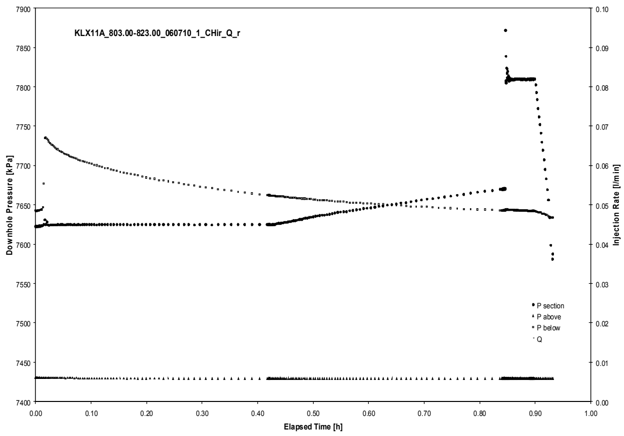
Comments:

Based on the test response the interval transmissivity is lower than 1.0E 11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060710 08:19
Test section from - to (m):	803.00-823.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	7623		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	18.8		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

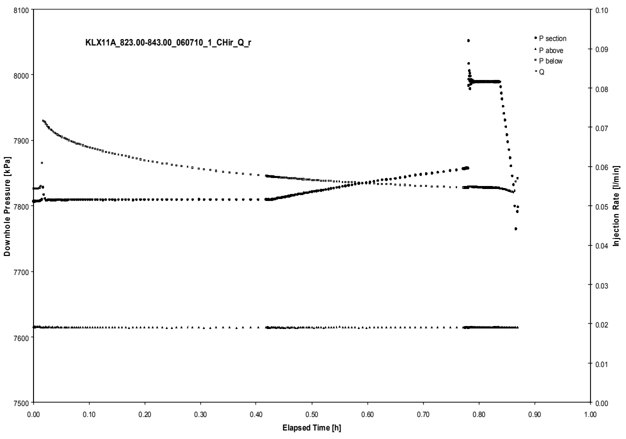
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060710 09:45
Test section from - to (m):	823.00-843.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	7807		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	19.1		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

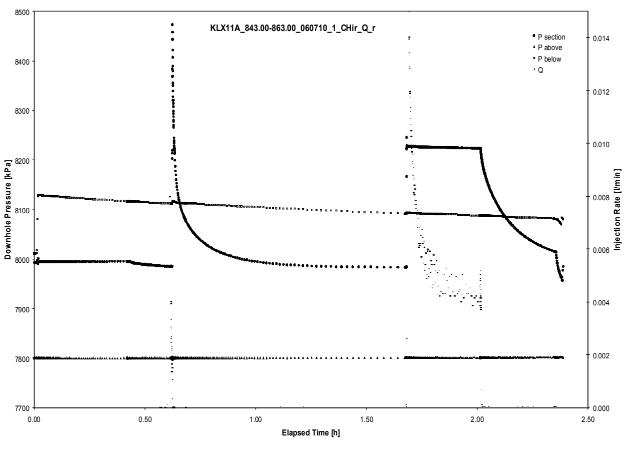
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

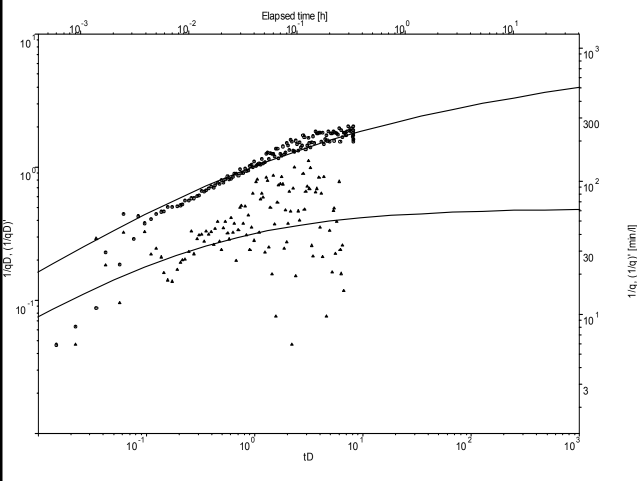
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060710 11:10
Test section from - to (m):	843.00-863.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

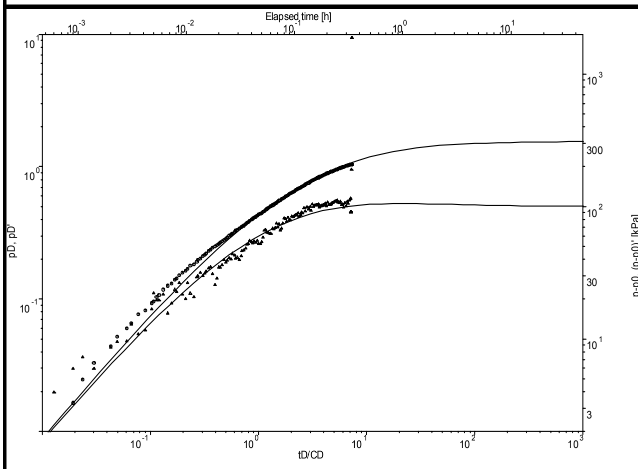


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	7794		
p_i (kPa) =	7983		
p_p(kPa) =	8223	p_F (kPa) =	8013
Q_p (m^3/s)=	6.67E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	19.5		
Derivative fact.=	0.08	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.7E-09		
T_M (m^2/s)=	2.9E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	8.5E-10	T (m^2/s) =	8.2E-10
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	4.3E-11	K_s (m/s) =	4.1E-11
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	8.8E-11
C_D (-) =	NA	C_D (-) =	9.7E-03
ξ (-) =	-2.2	ξ (-) =	-2.3
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	8.8E-11
dt_2 (min) =	NA	C_D (-) =	9.7E-03
T_T (m^2/s) =	8.2E-10	ξ (-) =	-2.3
S (-) =	1.0E-06		
K_s (m/s) =	4.1E-11		
S_s (1/m) =	5.0E-08		

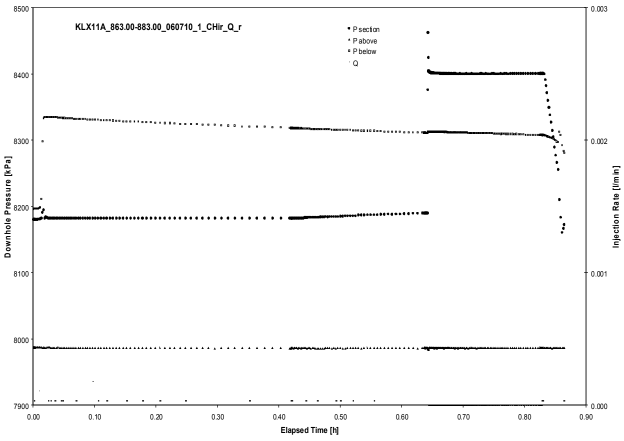
Comments:

The recommended transmissivity of 8.2E-10 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5.0E-10 to 1.0E-09 m2/s. Due to the low transmissivity no fresh water head was calculated.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060710 14:04
Test section from - to (m):	863.00-883.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	NA		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S* (-)=	NA	S el S* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	19.8		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

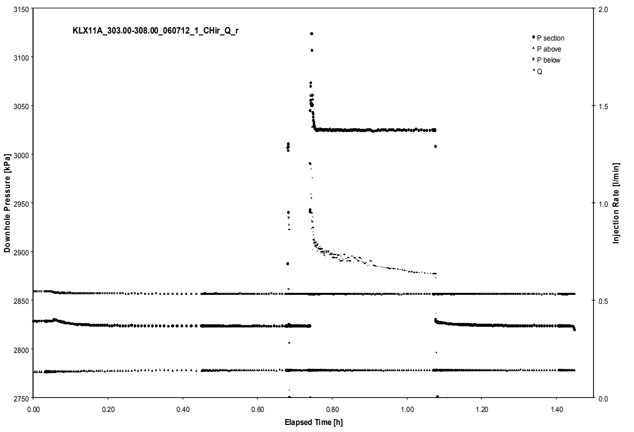
Comments:

Based on the test response the interval transmissivity is lower than 1.0E 11 m2/s.

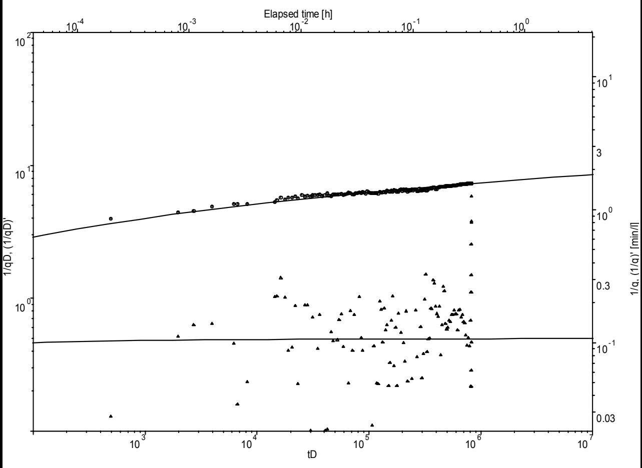
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060712 07:38
Test section from - to (m):	303.00-308.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

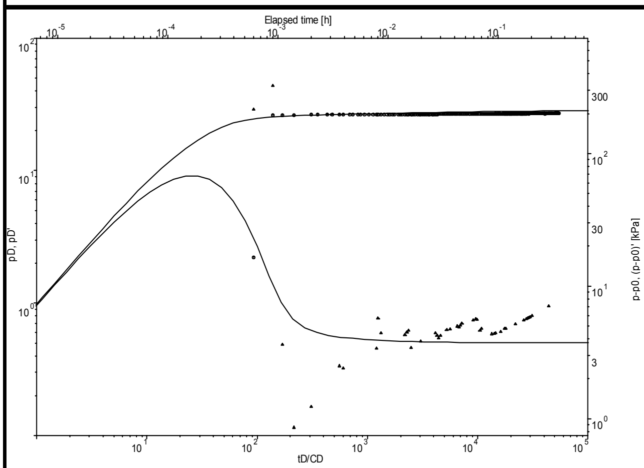
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2828		
p_i (kPa) =	2823		
p_p(kPa) =	3024	p_F (kPa) =	2823
Q_p (m^3/s)=	1.06E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.1		
Derivative fact.=	0.06	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	5.2E-07		
T_M (m^2/s)=	4.3E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.50	dt_1 (min) =	0.47
dt_2 (min) =	17.83	dt_2 (min) =	2.18
T (m^2/s) =	6.0E-07	T (m^2/s) =	2.4E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.2E-07	K_s (m/s) =	4.9E-07
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.6E-11
C_D (-) =	NA	C_D (-) =	4.0E-03
ξ (-) =	0.3	ξ (-) =	21.2
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.

dt_1 (min) =	0.50	C (m^3/Pa) =	3.6E-11
dt_2 (min) =	17.83	C_D (-) =	4.0E-03
T_T (m^2/s) =	6.0E-07	ξ (-) =	0.3
S (-) =	1.0E-06		
K_s (m/s) =	1.2E-07		
S_s (1/m) =	2.0E-07		

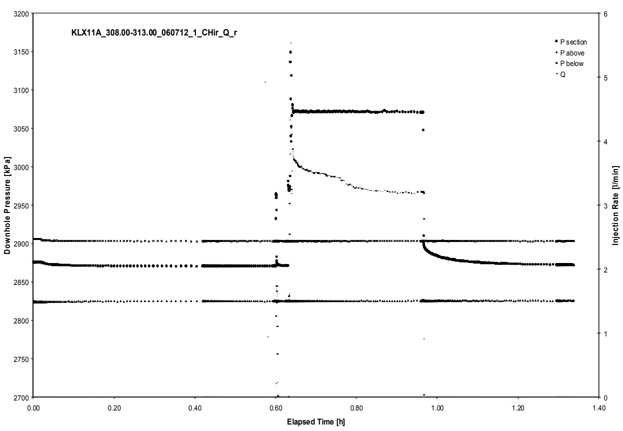
Comments:

The recommended transmissivity of 6.0E-7 m2/s was derived from the radial flow analysis of the CHi phase, which is showing the best data quality. The confidence range for the interval transmissivity is estimated to be 2.0E-7 to 9.0E-7 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,822.7 kPa.

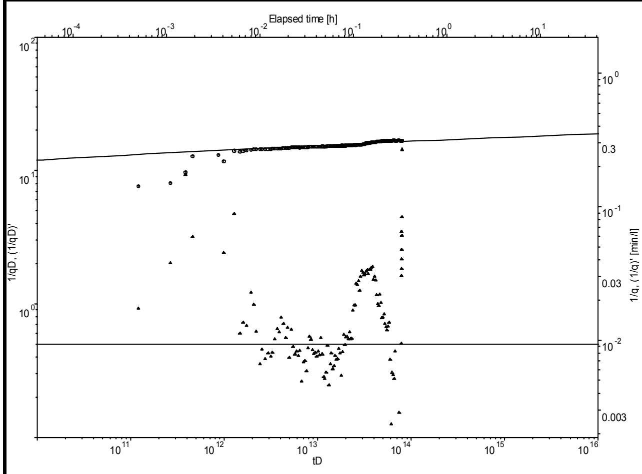
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060712 09:30
Test section from - to (m):	308.00-313.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

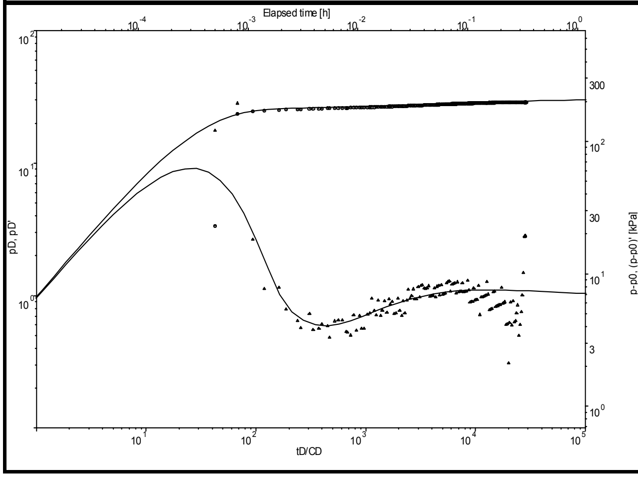
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	2875		
p_i (kPa) =	2871		
p_p(kPa) =	3071	p_F (kPa) =	2871
Q_p (m^3/s)=	5.33E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.3		
Derivative fact.=	0.1	Derivative fact.=	0.09
Results		**Results**	
Q/s (m^2/s)=	2.6E-06		
T_M (m^2/s)=	2.2E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.55	dt_1 (min) =	3.33
dt_2 (min) =	4.85	dt_2 (min) =	12.15
T (m^2/s) =	7.0E-06	T (m^2/s) =	6.5E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.4E-06	K_s (m/s) =	1.3E-06
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.5E-10
C_D (-) =	NA	C_D (-) =	3.8E-02
ξ (-) =	8.2	ξ (-) =	20.1
T_{GRF}(m^2/s) =	1.5E-06	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	NA
D_{GRF} (-) =	2.2	D_{GRF} (-) =	NA

Selected representative parameters.			
dt_1 (min) =	3.33	C (m^3/Pa) =	3.5E-10
dt_2 (min) =	12.15	C_D (-) =	3.8E-02
T_T (m^2/s) =	6.5E-06	ξ (-) =	20.1
S (-) =	1.0E-06		
K_s (m/s) =	1.3E-06		
S_s (1/m) =	2.0E-07		

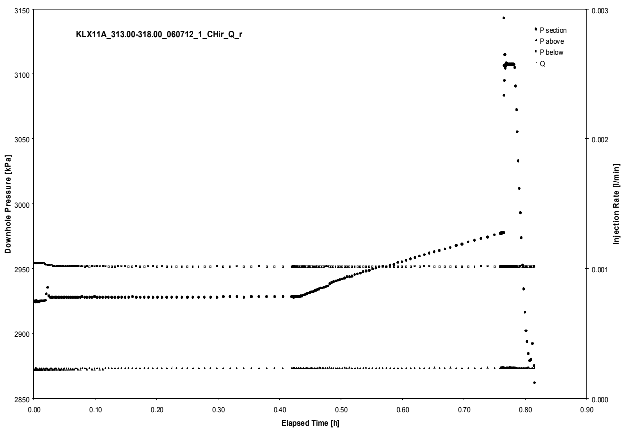
Comments:

The recommended transmissivity of 6.5E-6 m2/s was derived from the radial flow analysis of the CHir phase (outer zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 2.0E-6 to 9.0E-6 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,867.5 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060712 11:13
Test section from - to (m):	313.00-318.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2925		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.4		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

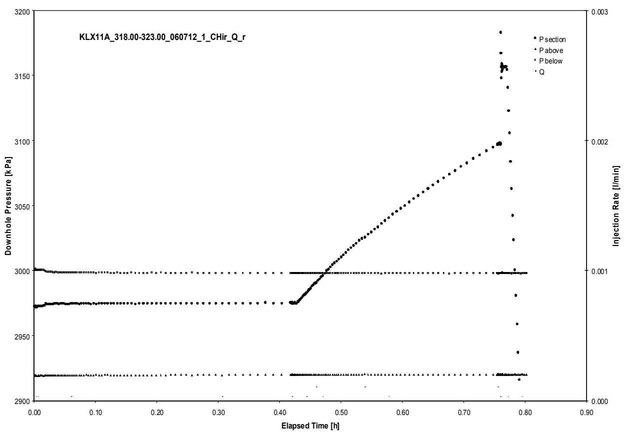
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060712 13:09
Test section from - to (m):	318.00-323.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2972		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.5		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

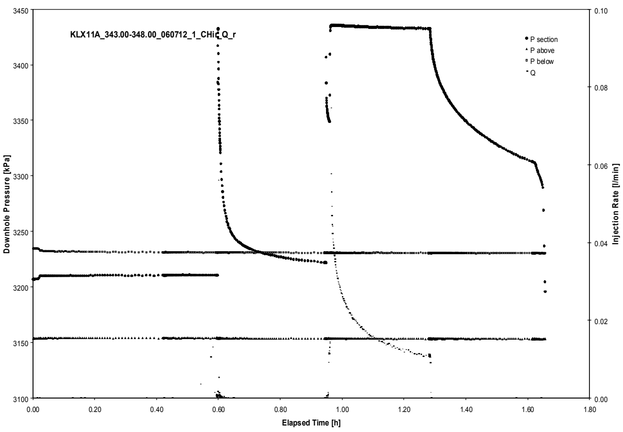
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

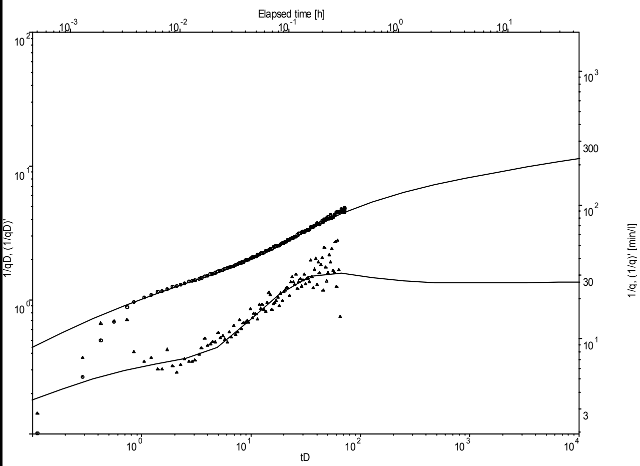
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060712 14:31
Test section from - to (m):	343.00-348.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

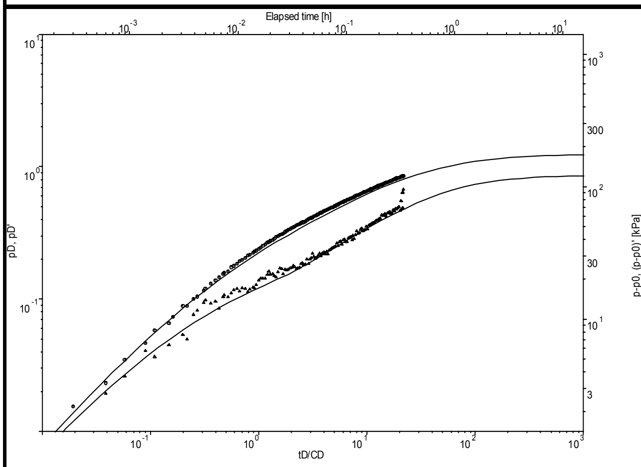


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3206		
p_i (kPa) =	3222		
p_p(kPa) =	3432	p_F (kPa) =	3312
Q_p (m^3/s)=	1.67E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.8		
Derivative fact.=	0.05	Derivative fact.=	0.06
Results		**Results**	
Q/s (m^2/s)=	7.8E-09		
T_M (m^2/s)=	6.4E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	6.3E-09	T (m^2/s) =	3.6E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.3E-09	K_s (m/s) =	7.2E-10
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.3E-10
C_D (-) =	NA	C_D (-) =	1.4E-02
ξ (-) =	-2.1	ξ (-) =	-3.6
T_{GRF}(m^2/s) =	6.3E-09	T_{GRF}(m^2/s) =	3.6E-09
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	1.68	D_{GRF} (-) =	1.76

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	1.3E-10
dt_2 (min) =	NA	C_D (-) =	1.4E-02
T_T (m^2/s) =	3.6E-09	ξ (-) =	-3.6
S (-) =	1.0E-06		
K_s (m/s) =	7.2E-10		
S_s (1/m) =	2.0E-07		

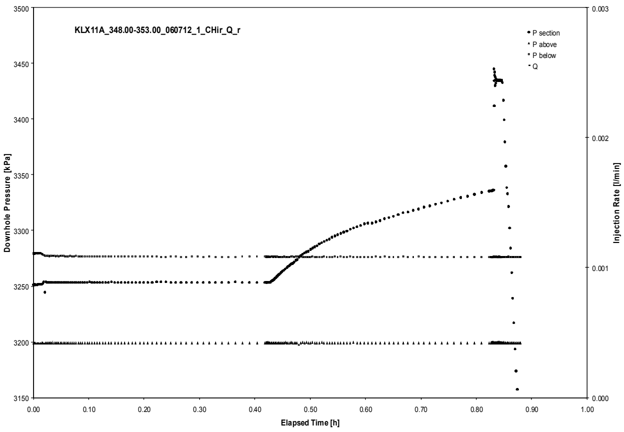
Comments:

The recommended transmissivity of 3.6E-9 m2/s was derived from the radial flow analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-9 to 8.0E-9 m2/s. Due to the low transmissivity no fresh water head was calculated.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060712 16:38
Test section from - to (m):	348.00-353.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3252		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.9		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

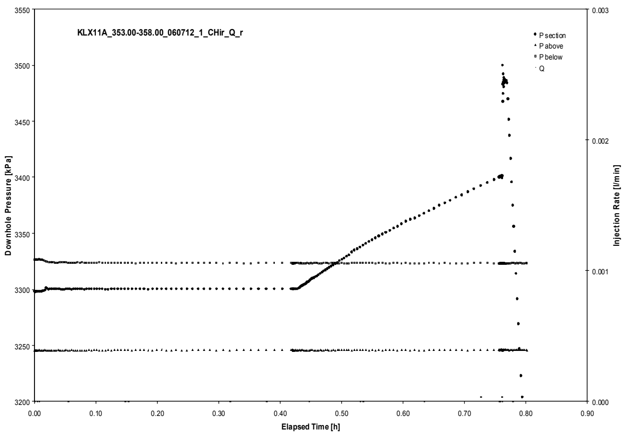
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060712 17:56
Test section from - to (m):	353.00-358.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3298		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.0		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

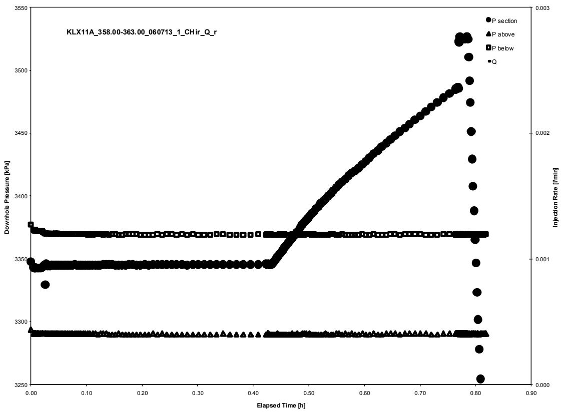
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060713 07:50
Test section from - to (m):	358.00-363.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3341		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.0		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

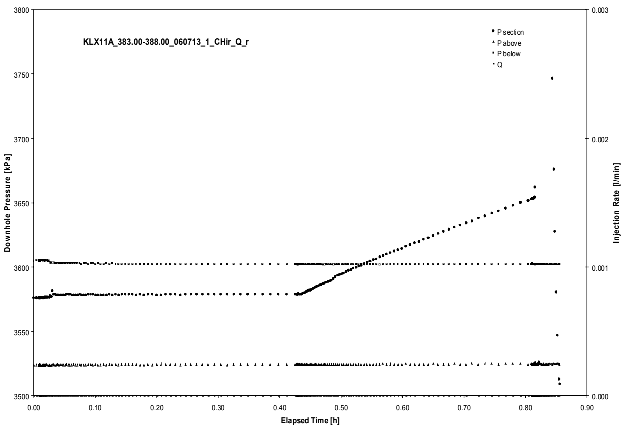
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060713 09:14
Test section from - to (m):	383.00-388.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3576		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.4		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

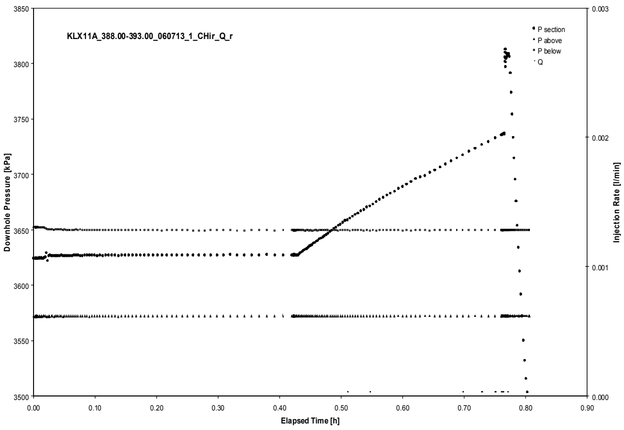
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060713 10:28
Test section from - to (m):	388.00-393.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3624		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.5		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

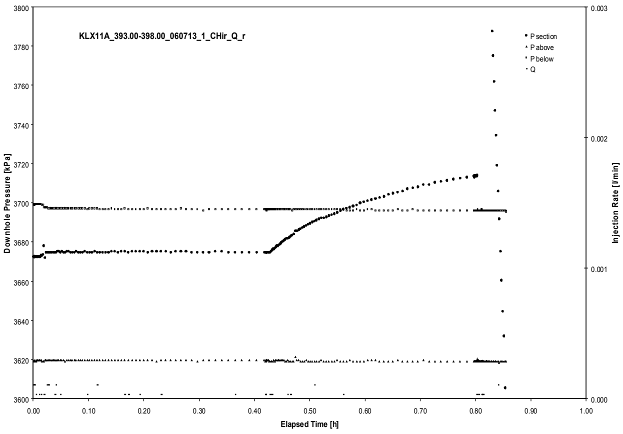
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060713 12:29
Test section from - to (m):	393.00-398.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3673		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.5		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		

Log-Log plot incl. derivates- flow period

Not Analysed

Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

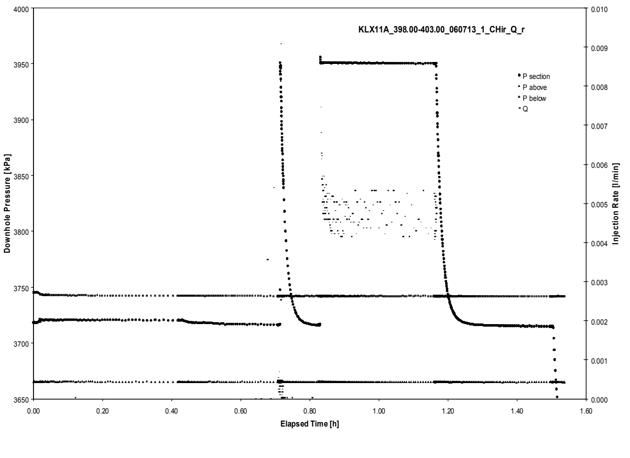
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

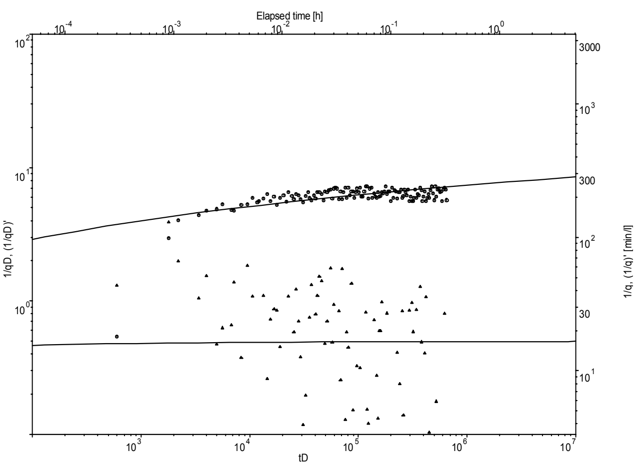
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060713 13:44
Test section from - to (m):	398.00-403.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

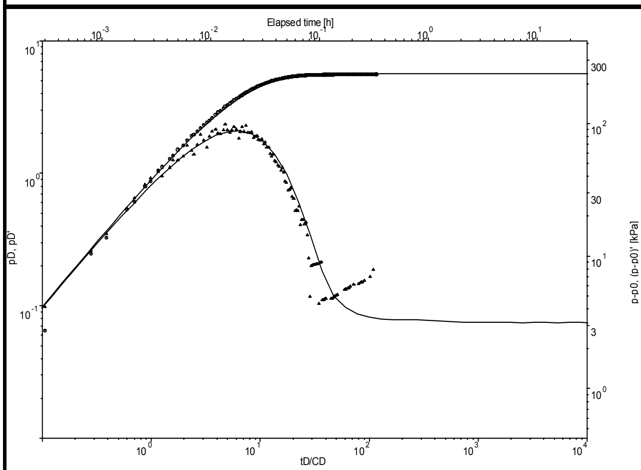
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3718		
p_i (kPa) =	3717		
p_p(kPa) =	3951	p_F (kPa) =	3715
Q_p (m^3/s)=	8.33E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.6		
Derivative fact.=	0.17	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	3.5E-09		
T_M (m^2/s)=	2.9E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.47	dt_1 (min) =	NA
dt_2 (min) =	11.45	dt_2 (min) =	NA
T (m^2/s) =	3.3E-09	T (m^2/s) =	3.0E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	6.7E-10	K_s (m/s) =	5.9E-10
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.0E-11
C_D (-) =	NA	C_D (-) =	2.1E-03
ξ (-) =	2.7	ξ (-) =	3.1
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	2.0E-11
dt_2 (min) =	NA	C_D (-) =	2.1E-03
T_T (m^2/s) =	3.0E-09	ξ (-) =	3.1
S (-) =	1.0E-06		
K_s (m/s) =	6.0E-10		
S_s (1/m) =	2.0E-07		

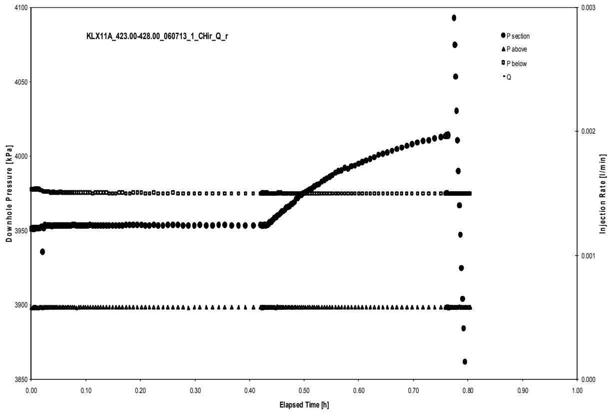
Comments:

The recommended transmissivity of 3.0E-09 m2/s was derived from the radial flow analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9.0E-10 to 6.0E-09 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,712.4 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060713 15:46
Test section from - to (m):	423.00-428.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3952		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.0		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

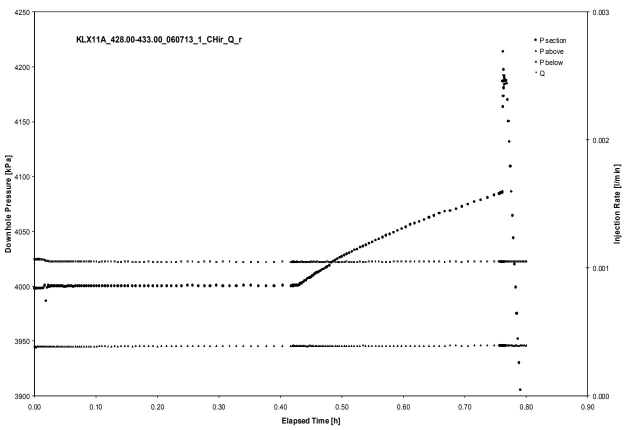
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060713 16:59
Test section from - to (m):	428.00-433.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3998		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.0		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

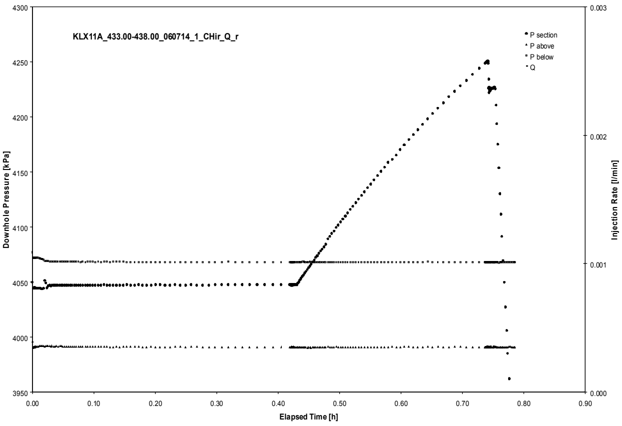
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060714 07:58
Test section from - to (m):	433.00-438.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4043		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.1		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

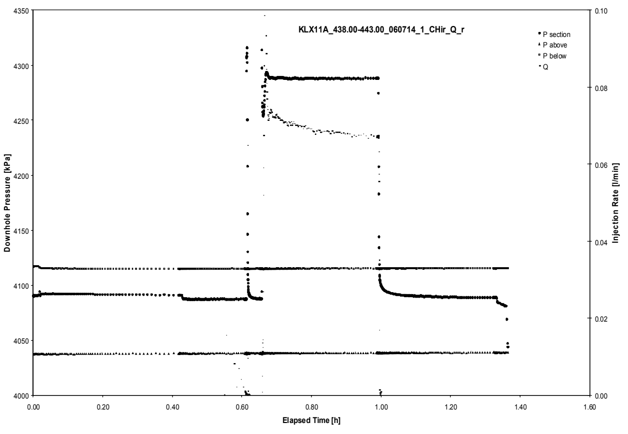
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

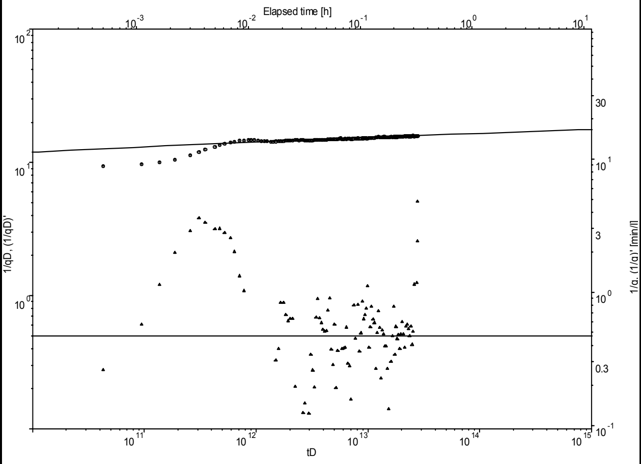
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060714 09:17
Test section from - to (m):	438.00-443.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

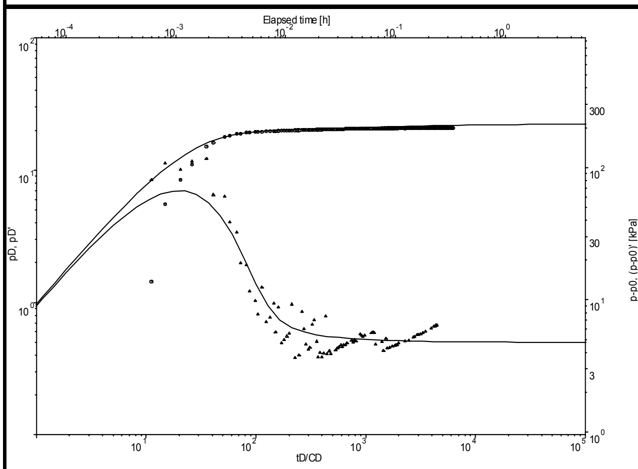
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4090		
p_i (kPa) =	4087		
p_p(kPa) =	4288	p_F (kPa) =	4088
Q_p (m^3/s)=	1.17E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.2		
Derivative fact.=	0.09	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	5.7E-08		
T_M (m^2/s)=	4.7E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.42	dt_1 (min) =	0.88
dt_2 (min) =	14.60	dt_2 (min) =	7.93
T (m^2/s) =	1.4E-07	T (m^2/s) =	1.9E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.7E-08	K_s (m/s) =	3.8E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.4E-11
C_D (-) =	NA	C_D (-) =	2.6E-03
ξ (-) =	9.7	ξ (-) =	15.7
T_{GRF}(m^2/s) =	2.8E-08	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	NA
D_{GRF} (-) =	2.2	D_{GRF} (-) =	NA

Selected representative parameters.

dt_1 (min) =	0.88	C (m^3/Pa) =	2.4E-11
dt_2 (min) =	7.93	C_D (-) =	2.6E-03
T_T (m^2/s) =	1.9E-07	ξ (-) =	15.7
S (-) =	1.0E-06		
K_s (m/s) =	3.8E-08		
S_s (1/m) =	2.0E-07		

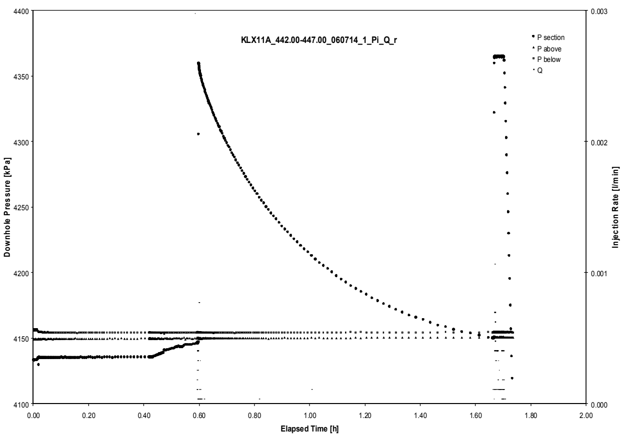
Comments:

The recommended transmissivity of 1.9E-7 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better derivative stabilization. The confidence range for the interval transmissivity is estimated to be 9.0E-8 to 5.0E-7 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,087.3 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060714 11:06
Test section from - to (m):	442.00-447.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

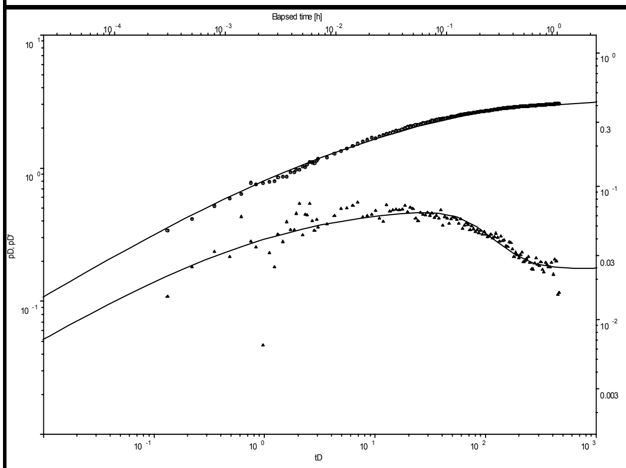


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4133		
p_i (kPa) =	4147		
p_p(kPa) =	4357	p_F (kPa) =	4150
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	3840
S el S^* (-)=	NA	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.3		
Derivative fact.=	NA	Derivative fact.=	0.09
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	0.95
dt_2 (min) =	NA	dt_2 (min) =	5.33
T (m^2/s) =	NA	T (m^2/s) =	1.2E-10
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	2.4E-11
S_s (1/m) =	NA	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.8E-11
C_D (-) =	NA	C_D (-) =	4.2E-03
ξ (-) =	NA	ξ (-) =	0.2
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	1.2E-10
S_{GRF}(-) =	NA	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	NA	D_{GRF} (-) =	2.23

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	0.95	C (m^3/Pa) =	3.8E-11
dt_2 (min) =	5.33	C_D (-) =	4.2E-03
T_T (m^2/s) =	1.2E-10	ξ (-) =	0.2
S (-) =	1.0E-06		
K_s (m/s) =	2.4E-11		
S_s (1/m) =	2.0E-07		

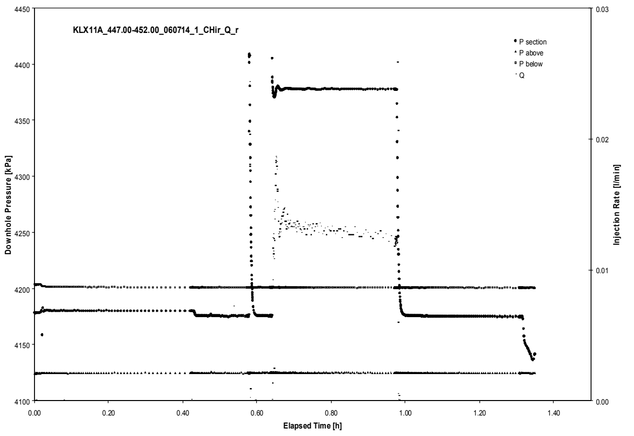
Comments:

The recommended transmissivity of 1.2E-10 m2/s was derived from the radial flow analysis of the Pi phase (inner zone). The confidence range for the interval transmissivity is estimated to be 8.0E-11 to 3.0E-10 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

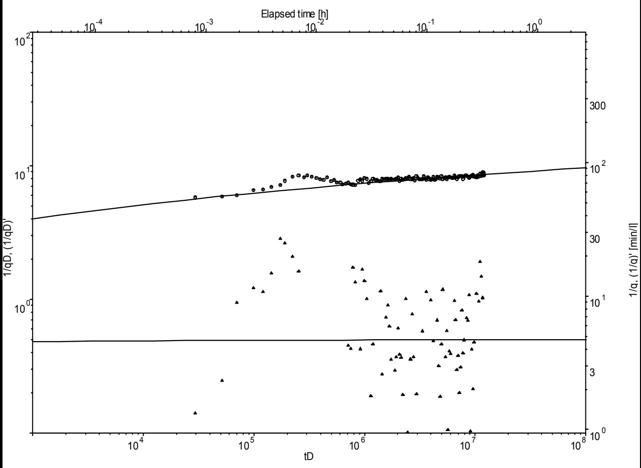
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060714 13:16
Test section from - to (m):	447.00-452.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

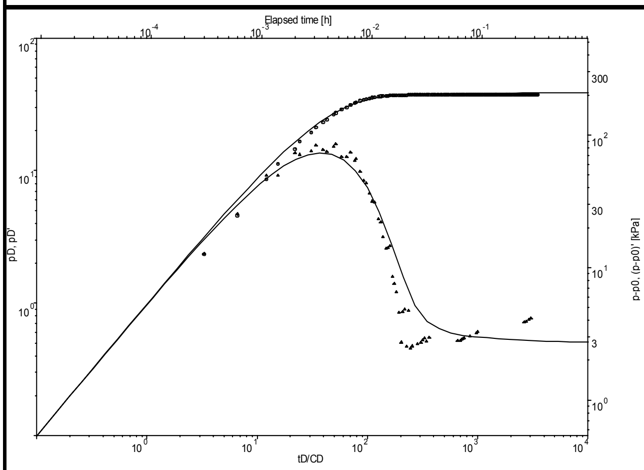
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4175		
p_i (kPa) =	4176		
p_p(kPa) =	4377	p_F (kPa) =	4175
Q_p (m^3/s)=	2.17E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.3		
Derivative fact.=	0.09	Derivative fact.=	0.04
Results		**Results**	
Q/s (m^2/s)=	1.1E-08		
T_M (m^2/s)=	8.7E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.95	dt_1 (min) =	NA
dt_2 (min) =	13.05	dt_2 (min) =	NA
T (m^2/s) =	1.4E-08	T (m^2/s) =	6.3E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.7E-09	K_s (m/s) =	1.3E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.3E-11
C_D (-) =	NA	C_D (-) =	1.5E-03
ξ (-) =	3.5	ξ (-) =	33.2
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.

dt_1 (min) =	1.95	C (m^3/Pa) =	1.3E-11
dt_2 (min) =	13.05	C_D (-) =	1.5E-03
T_T (m^2/s) =	1.4E-08	ξ (-) =	3.5
S (-) =	1.0E-06		
K_s (m/s) =	2.8E-09		
S_s (1/m) =	2.0E-07		

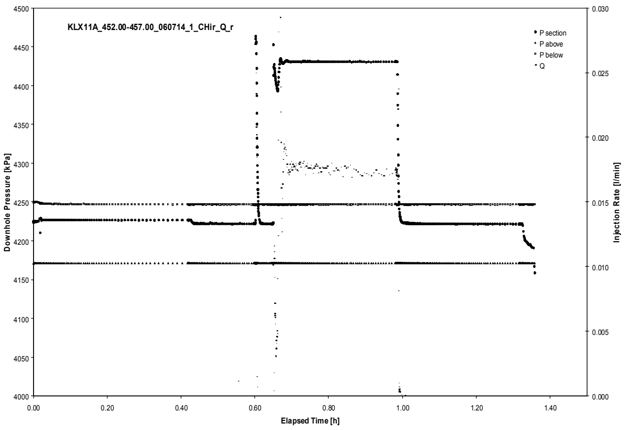
Comments:

The recommended transmissivity of 1.4E-08 m2/s was derived from the radial flow analysis of the CHi phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-09 to 3.0E-08 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,174.5 kPa.

Test Summary Sheet

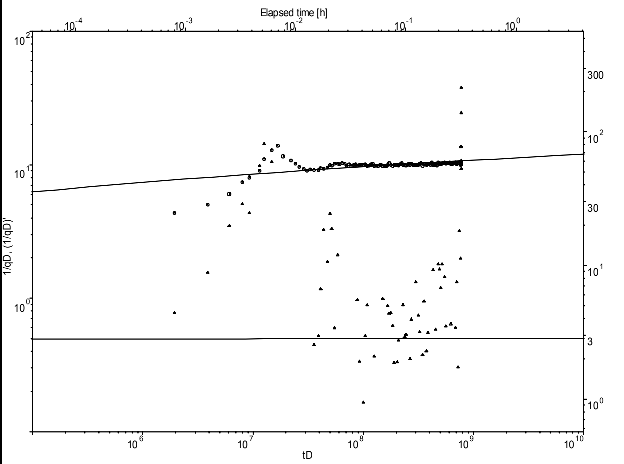
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060714 15:01
Test section from - to (m):	452.00-457.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, 2·r_w (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

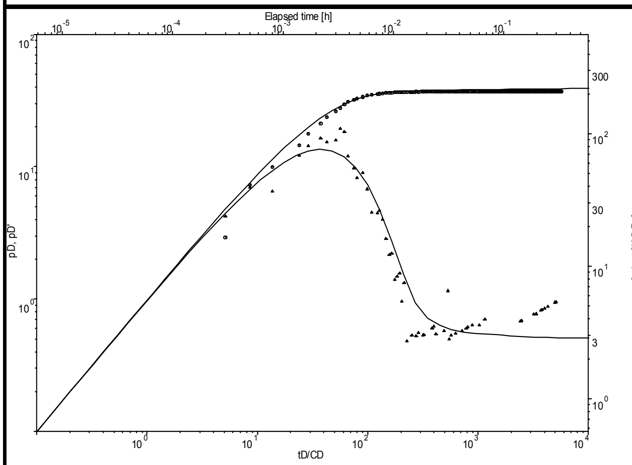


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4224		
p_i (kPa) =	4222		
p_p(kPa) =	4430	p_F (kPa) =	4221
Q_p (m^3/s)=	2.83E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.4		
Derivative fact.=	0.04	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	1.3E-08		
T_M (m^2/s)=	1.1E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2.28	dt_1 (min) =	1.35
dt_2 (min) =	15.33	dt_2 (min) =	2.85
T (m^2/s) =	2.2E-08	T (m^2/s) =	8.2E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	4.4E-09	K_s (m/s) =	1.6E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.1E-11
C_D (-) =	NA	C_D (-) =	1.2E-03
ξ (-) =	5.4	ξ (-) =	33.3
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	2.28	C (m^3/Pa) =	1.1E-11
dt_2 (min) =	15.33	C_D (-) =	1.2E-03
T_T (m^2/s) =	2.2E-08	ξ (-) =	5.4
S (-) =	1.0E-06		
K_s (m/s) =	4.4E-09		
S_s (1/m) =	2.0E-07		

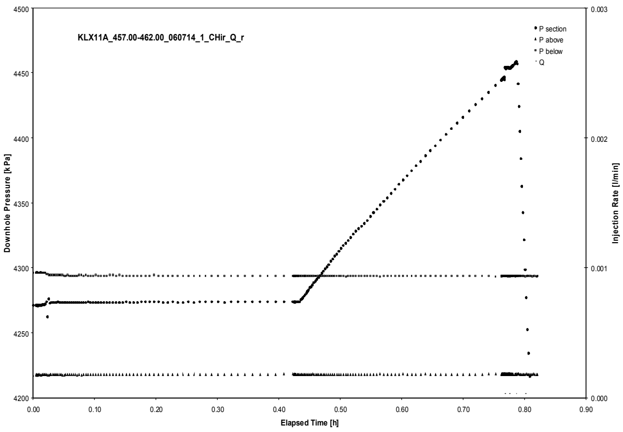
Comments:

The recommended transmissivity of 2.2E-8 m2/s was derived from the radial flow analysis of the CHi phase, which shows better data quality. The confidence range for the interval transmissivity is estimated to be 8.0E-9 to 4.0E-8 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,220.6 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060714 16:45
Test section from - to (m):	457.00-462.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4271		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.5		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

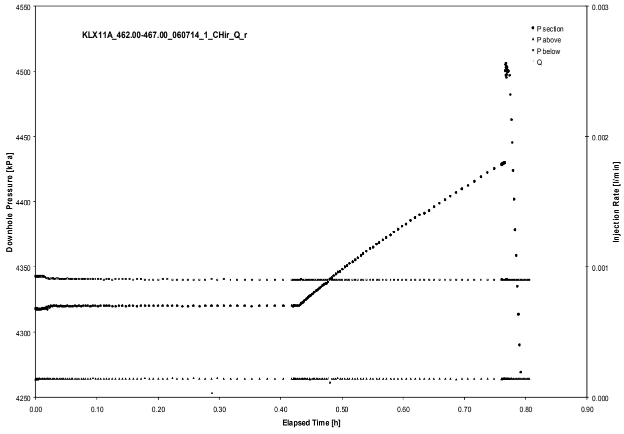
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060714 18:01
Test section from - to (m):	462.00-467.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4317		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.5		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

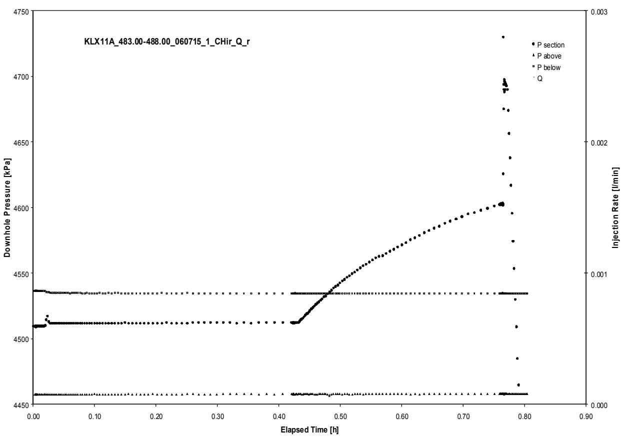
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060715 08:16
Test section from - to (m):	483.00-488.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4509		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.8		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

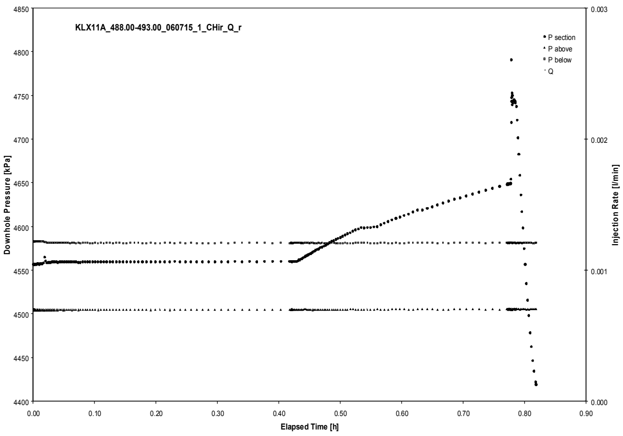
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060715 09:29
Test section from - to (m):	488.00-493.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4556		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.9		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Log-Log plot incl. derivatives- recovery period

Not Analysed

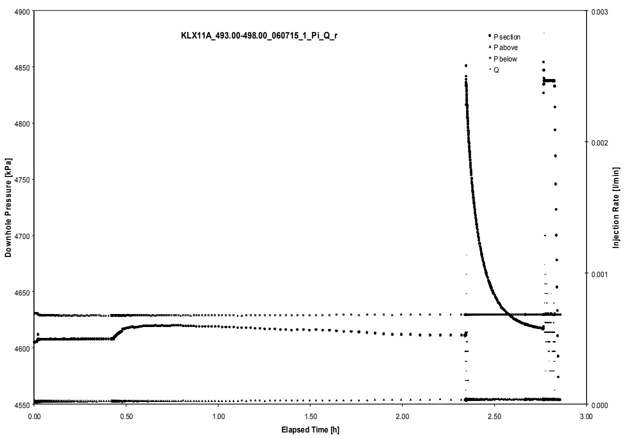
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060715 10:47
Test section from - to (m):	493.00-498.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

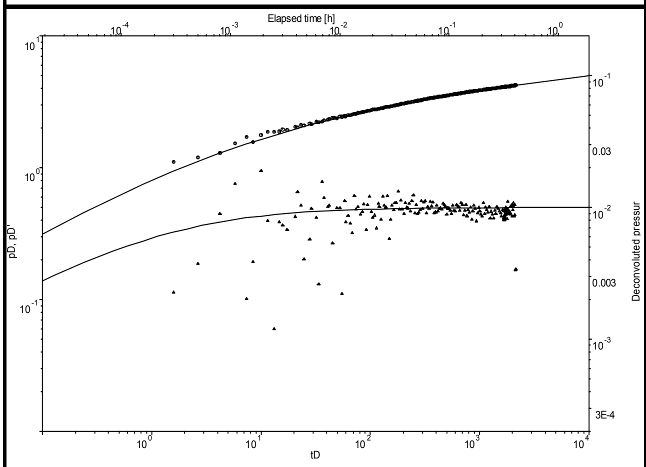


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4605		
p_i (kPa) =	4613		
p_p(kPa) =	4839	p_F (kPa) =	4617
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	1500
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.0		
Derivative fact.=	NA	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	0.47
dt_2 (min) =	NA	dt_2 (min) =	23.02
T (m^2/s) =	NA	T (m^2/s) =	2.6E-10
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	5.2E-11
S_s (1/m) =	NA	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.2E-11
C_D (-) =	NA	C_D (-) =	1.3E-03
ξ (-) =	NA	ξ (-) =	1.1
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0.47	C (m^3/Pa) =	1.2E-11
dt_2 (min) =	23.02	C_D (-) =	1.3E-03
T_T (m^2/s) =	2.6E-10	ξ (-) =	1.1
S (-) =	1.0E-06		
K_s (m/s) =	5.2E-11		
S_s (1/m) =	2.0E-07		

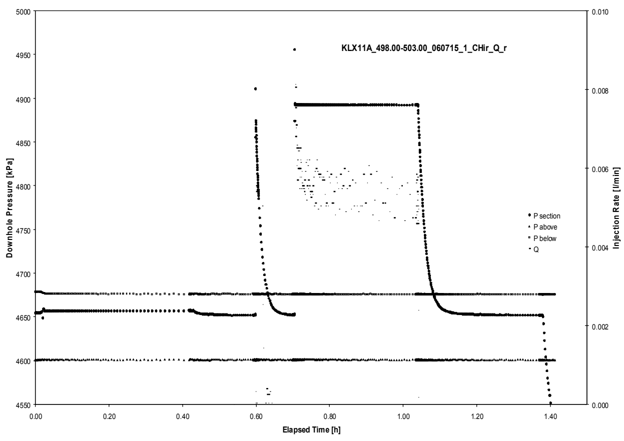
Comments:

The recommended transmissivity of 2.6E-10 m2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 9.0E-11 to 4.0E-10 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

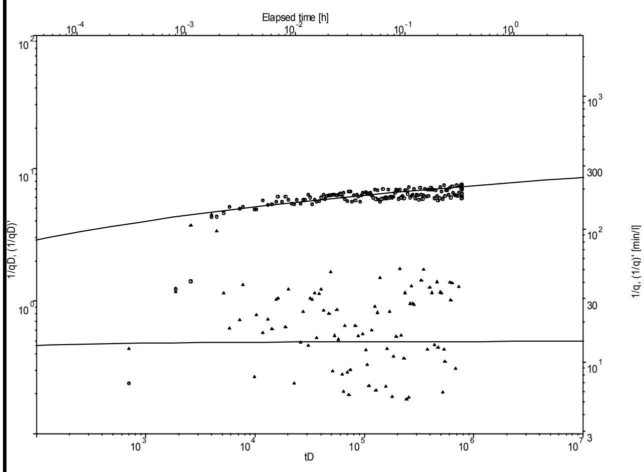
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060715 14:04
Test section from - to (m):	498.00-503.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

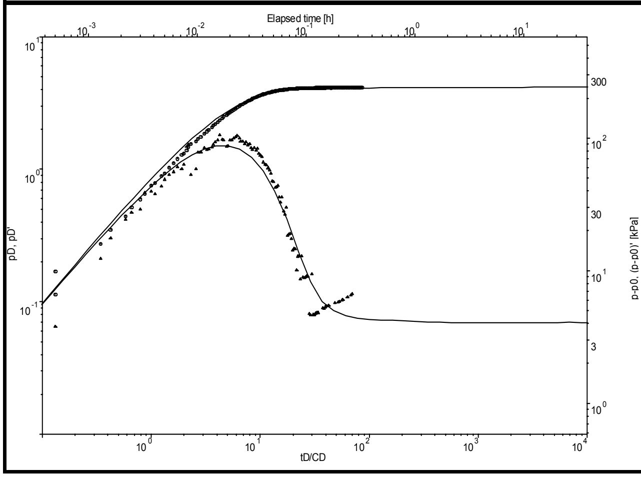
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4655		
p_i (kPa) =	4652		
p_p(kPa) =	4893	p_F (kPa) =	4652
Q_p (m^3/s)=	8.33E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.0		
Derivative fact.=	0.18	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	3.4E-09		
T_M (m^2/s)=	2.8E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.67	dt_1 (min) =	NA
dt_2 (min) =	13.67	dt_2 (min) =	NA
T (m^2/s) =	3.8E-09	T (m^2/s) =	2.5E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	7.5E-10	K_s (m/s) =	5.1E-10
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.2E-11
C_D (-) =	NA	C_D (-) =	2.4E-03
ξ (-) =	2.8	ξ (-) =	1.6
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	2.2E-11
dt_2 (min) =	NA	C_D (-) =	2.4E-03
T_T (m^2/s) =	2.5E-09	ξ (-) =	1.6
S (-) =	1.0E-06		
K_s (m/s) =	5.0E-10		
S_s (1/m) =	2.0E-07		

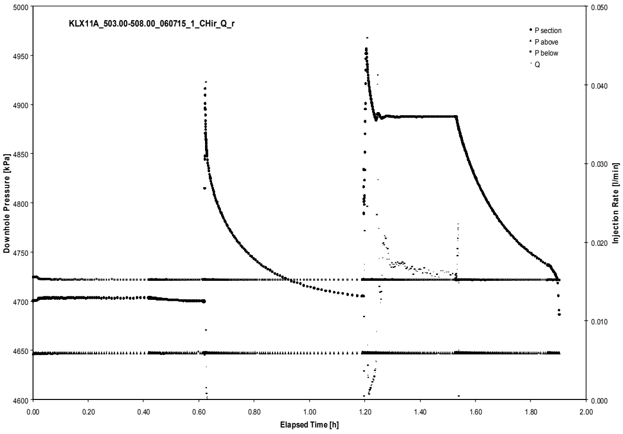
Comments:

The recommended transmissivity of 2.5E-9 m2/s was derived from the radial flow analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-10 to 5.0E-09 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,650.5 kPa.

Test Summary Sheet

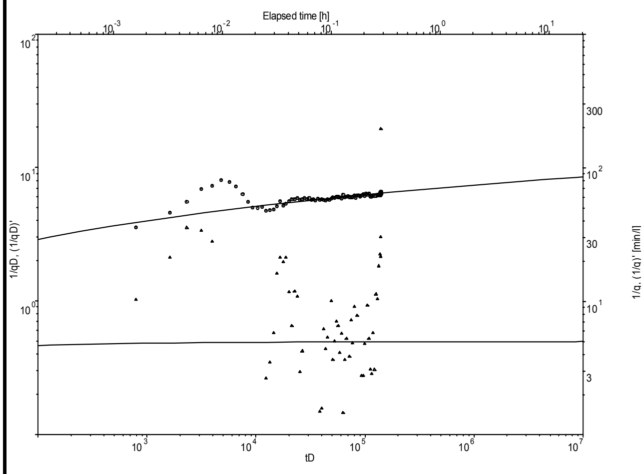
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060715 15:53
Test section from - to (m):	503.00-508.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

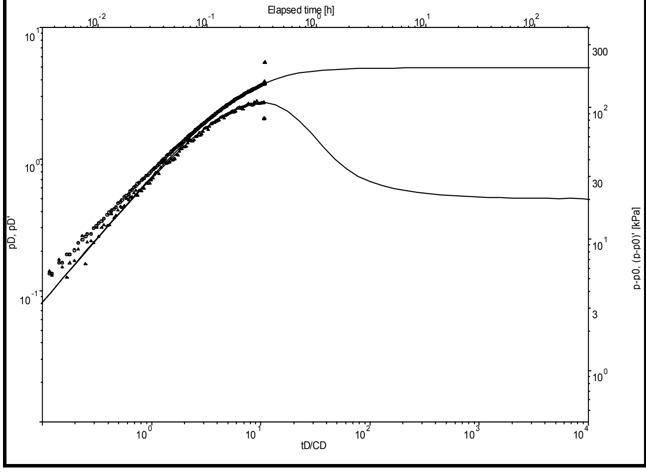


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4700		
p_i (kPa) =	4705		
p_p(kPa) =	4887	p_F (kPa) =	4735
Q_p (m^3/s)=	2.83E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.1		
Derivative fact.=	0.1	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	1.5E-08		
T_M (m^2/s)=	1.3E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.76	dt_1 (min) =	NA
dt_2 (min) =	12.10	dt_2 (min) =	NA
T (m^2/s) =	1.4E-08	T (m^2/s) =	1.1E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.8E-09	K_s (m/s) =	2.2E-09
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	7.7E-10
C_D (-) =	NA	C_D (-) =	8.5E-02
ξ (-) =	1.3	ξ (-) =	1.2
T_{GRF}(m^2/s) =	7.9E-09	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	NA
D_{GRF} (-) =	2.1	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	7.7E-10
dt_2 (min) =	NA	C_D (-) =	8.5E-02
T_T (m^2/s) =	1.1E-08	ξ (-) =	1.2
S (-) =	1.0E-06		
K_s (m/s) =	2.2E-09		
S_s (1/m) =	2.0E-07		

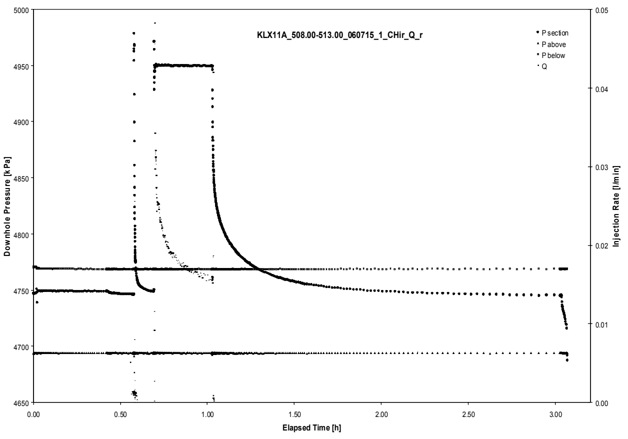
Comments:

The recommended transmissivity of 1.1E-08 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7.0E-09 to 5.0E-08 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,687.3 kPa.

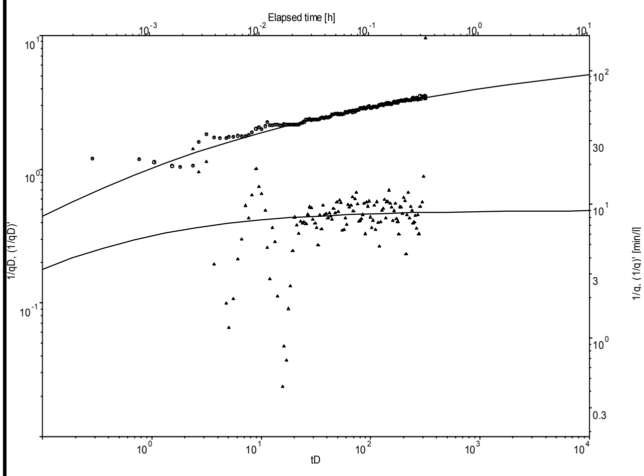
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060715 18:09
Test section from - to (m):	508.00-513.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

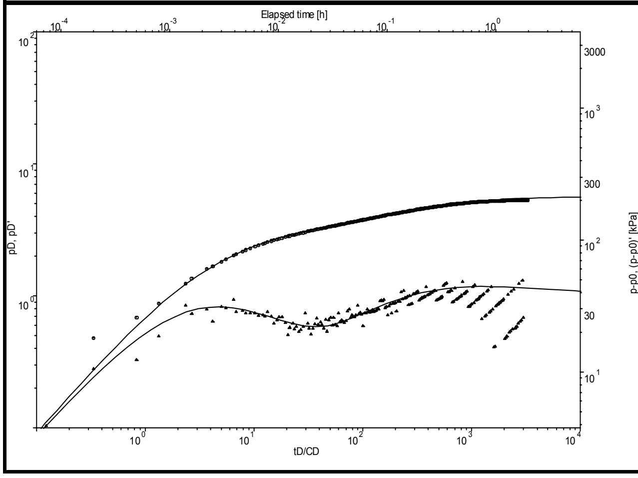
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4747		
p_i (kPa) =	4751		
p_p(kPa) =	4950	p_F (kPa) =	4746
Q_p (m^3/s)=	2.67E-07		
tp (s) =	1200	t_F (s) =	7200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.2		
Derivative fact.=	0.1	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.3E-08		
T_M (m^2/s)=	1.1E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.68	dt_1 (min) =	0.70
dt_2 (min) =	16.93	dt_2 (min) =	2.08
T (m^2/s) =	7.1E-09	T (m^2/s) =	1.3E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.4E-09	K_s (m/s) =	2.6E-09
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.8E-11
C_D (-) =	NA	C_D (-) =	2.0E-03
ξ (-) =	-1.5	ξ (-) =	-0.3
T_{GRF}(m^2/s) =	1.2E-08	T_{GRF}(m^2/s) =	1.3E-08
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	1.9	D_{GRF} (-) =	1.86

Selected representative parameters.			
dt_1 (min) =	0.70	C (m^3/Pa) =	1.8E-11
dt_2 (min) =	2.08	C_D (-) =	2.0E-03
T_T (m^2/s) =	1.3E-08	ξ (-) =	-0.3
S (-) =	1.0E-06		
K_s (m/s) =	2.6E-09		
S_s (1/m) =	2.0E-07		

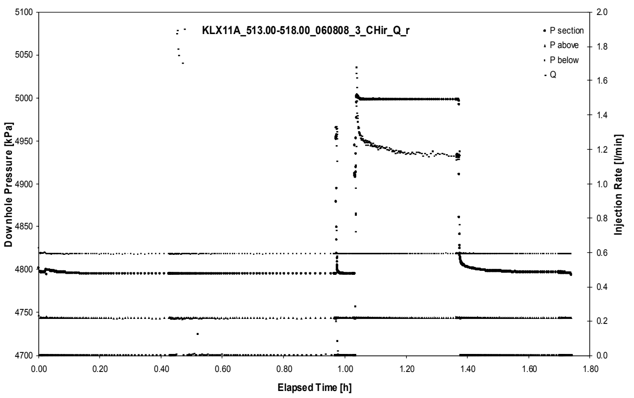
Comments:

The recommended transmissivity of 1.3E-08 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7.0E-09 to 3.0E-08 m2/s (this range includes the derived transmissivity from the CHi phase). The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,738.8 kPa.

Test Summary Sheet

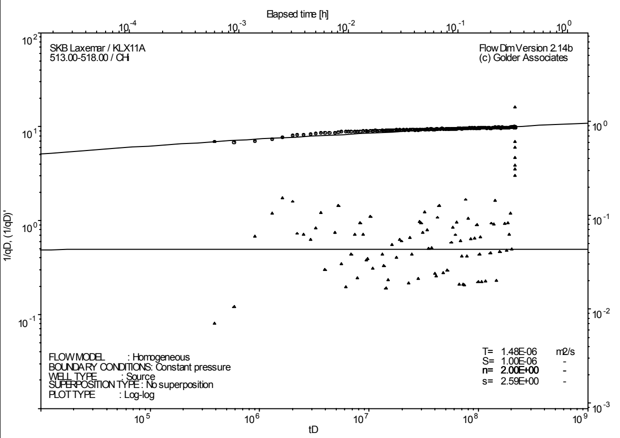
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	3
Borehole ID:	KLX11A	Test start:	060808 15:30
Test section from - to (m):	513.00-518.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

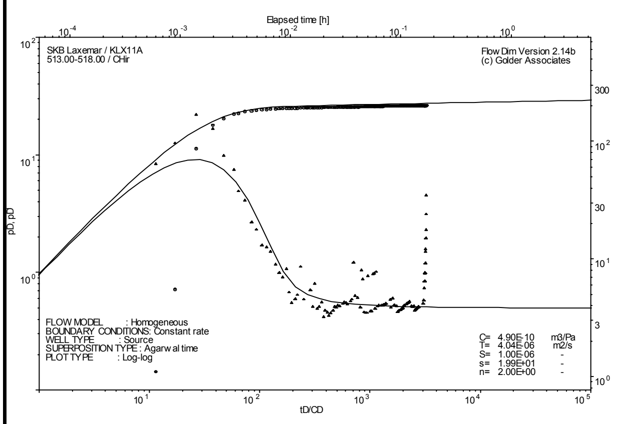


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4797		
p_i (kPa) =	4795		
p_p(kPa) =	4996	p_F (kPa) =	4794
Q_p (m^3/s)=	1.93E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.3		
Derivative fact.=	0.02	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	9.4E-07		
T_M (m^2/s)=	7.8E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.64	dt_1 (min) =	1.15
dt_2 (min) =	16.82	dt_2 (min) =	8.73
T (m^2/s) =	1.5E-06	T (m^2/s) =	4.0E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.0E-07	K_s (m/s) =	8.0E-07
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	4.9E-10
C_D (-) =	NA	C_D (-) =	5.4E-02
ξ (-) =	2.6	ξ (-) =	19.9
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	1.15	C (m^3/Pa) =	4.9E-10
dt_2 (min) =	8.73	C_D (-) =	5.4E-02
T_T (m^2/s) =	4.0E-06	ξ (-) =	19.9
S (-) =	1.0E-06		
K_s (m/s) =	8.0E-07		
S_s (1/m) =	2.0E-07		

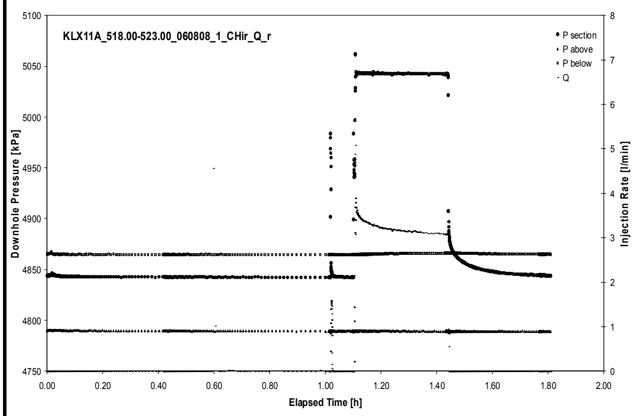
Comments:

The recommended transmissivity of 4.0•10-6 m2/s was derived from the radial flow analysis of the CHir phase, because it shows the most clear derivative stabilization. The confidence range for the interval transmissivity is estimated to be 2.0E-6 to 6.0E-6 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,794.0 kPa.

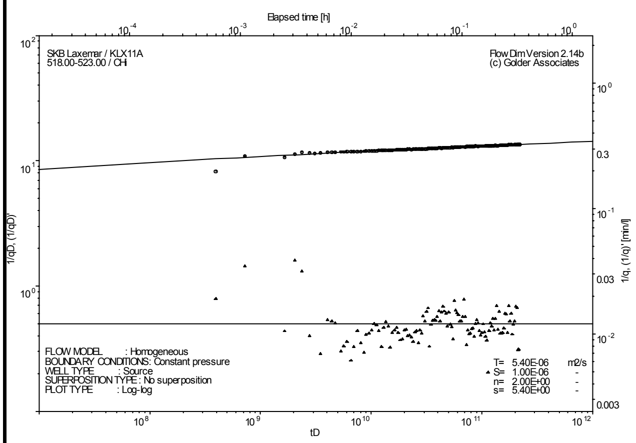
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060808 17:47
Test section from - to (m):	518.00-523.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

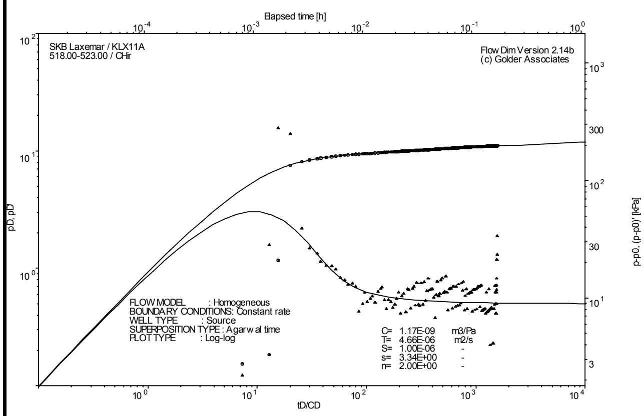
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4844		
p_i (kPa) =	4842		
p_p(kPa) =	5042	p_F (kPa) =	4844
Q_p (m^3/s)=	5.12E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.4		
Derivative fact.=	0.10	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.5E-06		
T_M (m^2/s)=	2.1E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2.78	dt_1 (min) =	1.04
dt_2 (min) =	17.59	dt_2 (min) =	9.11
T (m^2/s) =	5.4E-06	T (m^2/s) =	4.7E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.1E-06	K_s (m/s) =	9.4E-07
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.2E-09
C_D (-) =	NA	C_D (-) =	1.3E-01
ξ (-) =	5.4	ξ (-) =	3.3
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.			
dt_1 (min) =	1.04	C (m^3/Pa) =	1.2E-09
dt_2 (min) =	9.11	C_D (-) =	1.3E-01
T_T (m^2/s) =	4.7E-06	ξ (-) =	3.3
S (-) =	1.0E-06		
K_s (m/s) =	9.4E-07		
S_s (1/m) =	2.0E-07		

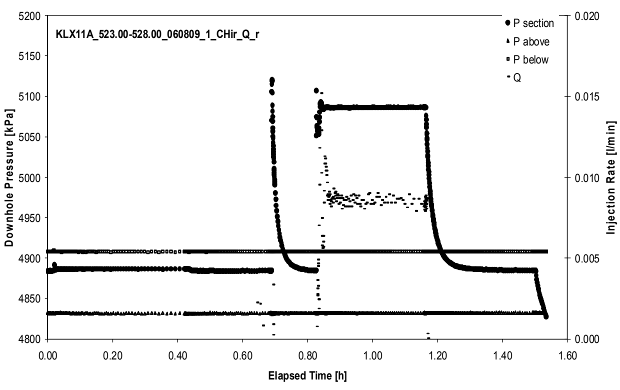
Comments:

The recommended transmissivity of 4.7E-6 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 2.0E-6 to 7.0E-6 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,837.1 kPa.

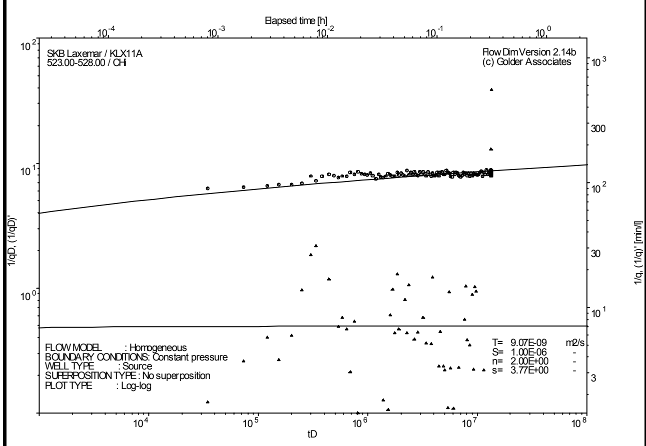
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060809 08:08
Test section from - to (m):	523.00-528.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

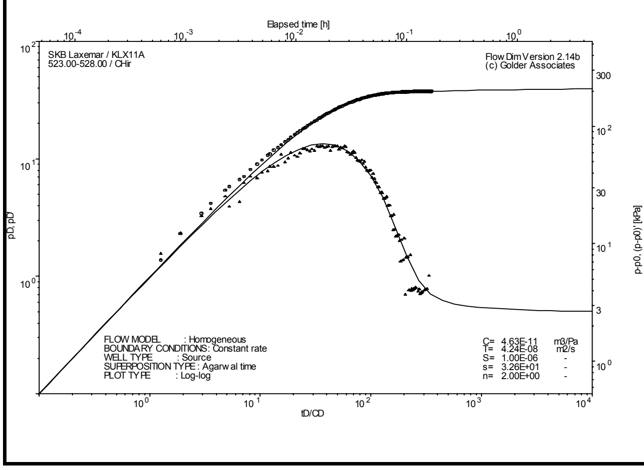
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4884		
p_i (kPa) =	4885		
p_p(kPa) =	5086	p_F (kPa) =	4884
Q_p (m^3/s)=	1.43E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.5		
Derivative fact.=	0.12	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	7.0E-09		
T_M (m^2/s)=	5.8E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2.47	dt_1 (min) =	NA
dt_2 (min) =	10.65	dt_2 (min) =	NA
T (m^2/s) =	9.1E-09	T (m^2/s) =	4.2E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.8E-09	K_s (m/s) =	8.4E-09
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	4.6E-11
C_D (-) =	NA	C_D (-) =	5.1E-03
ξ (-) =	3.8	ξ (-) =	32.6
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	4.6E-11
dt_2 (min) =	NA	C_D (-) =	5.1E-03
T_T (m^2/s) =	4.2E-08	ξ (-) =	32.6
S (-) =	1.0E-06		
K_s (m/s) =	8.4E-09		
S_s (1/m) =	2.0E-07		

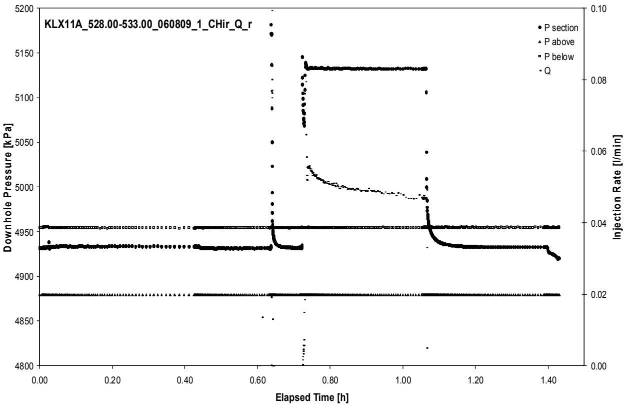
Comments:

The recommended transmissivity of 4.2E-8 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-8 to 7.0E-8 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,881.0 kPa.

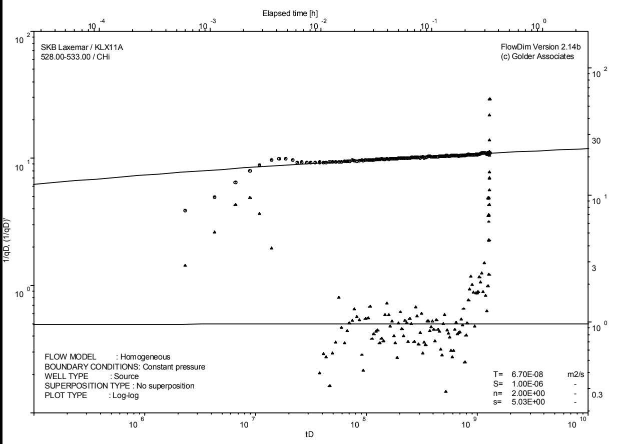
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060809 10:08
Test section from - to (m):	528.00-533.00	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

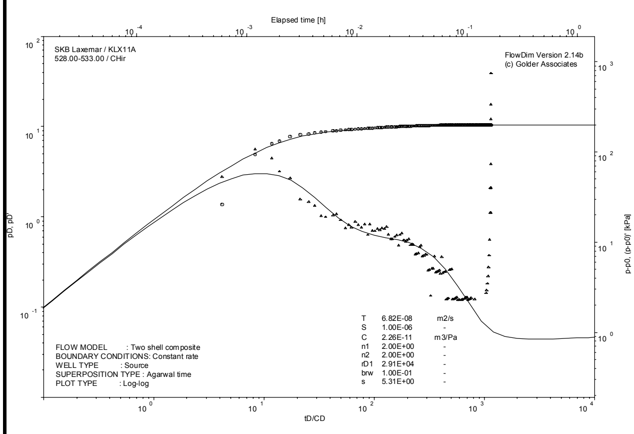
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4931		
p_i (kPa) =	4932		
p_p(kPa) =	5132	p_F (kPa) =	4931
Q_p (m^3/s)=	7.83E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.6		
Derivative fact.=	0.10	Derivative fact.=	0.04
Results		**Results**	
Q/s (m^2/s)=	3.8E-08		
T_M (m^2/s)=	3.2E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.09	dt_1 (min) =	0.53
dt_2 (min) =	11.33	dt_2 (min) =	1.72
T (m^2/s) =	6.7E-08	T (m^2/s) =	6.8E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.3E-08	K_s (m/s) =	1.4E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.3E-11
C_D (-) =	NA	C_D (-) =	2.5E-03
ξ (-) =	5.0	ξ (-) =	5.3
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	3.1E-09
S_{GRF}(-) =	NA	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	NA	D_{GRF} (-) =	3.0

Selected representative parameters.

dt_1 (min) =	1.09	C (m^3/Pa) =	2.3E-11
dt_2 (min) =	11.33	C_D (-) =	2.5E-03
T_T (m^2/s) =	6.7E-08	ξ (-) =	5.0
S (-) =	1.0E-06		
K_s (m/s) =	1.3E-08		
S_s (1/m) =	2.0E-07		

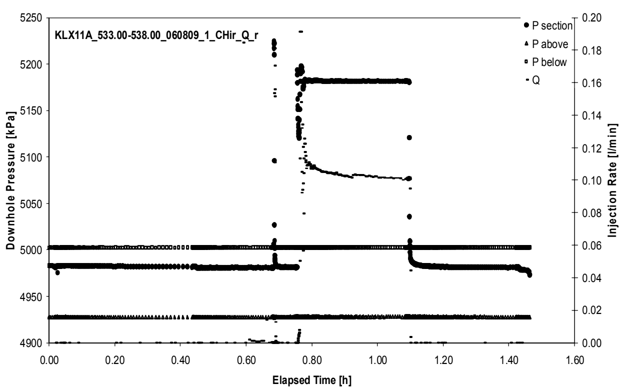
Comments:

The recommended transmissivity of 6.7•10-8 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3.0•10-8 to 9.0•10-8 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,932.1 kPa.

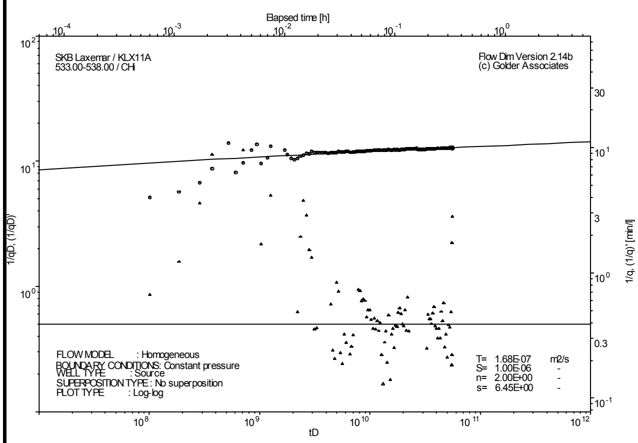
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060809 12:48
Test section from - to (m):	533.00-538.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

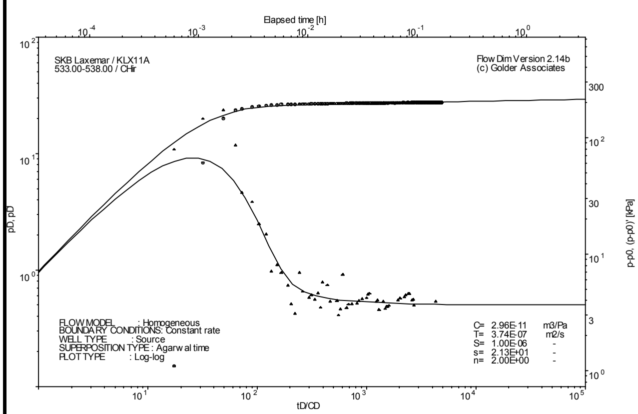
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4983		
p_i (kPa) =	4981		
p_p(kPa) =	5180	p_F (kPa) =	4981
Q_p (m^3/s)=	1.67E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.6		
Derivative fact.=	0.07	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	8.2E-08		
T_M (m^2/s)=	6.8E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	3.30	dt_1 (min) =	NA
dt_2 (min) =	18.75	dt_2 (min) =	NA
T (m^2/s) =	1.7E-07	T (m^2/s) =	3.7E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.4E-08	K_s (m/s) =	7.4E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.0E-11
C_D (-) =	NA	C_D (-) =	3.3E-03
ξ (-) =	6.5	ξ (-) =	21.3
T_{GRF}(m^2/s) =	2.8E-08	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	NA
D_{GRF} (-) =	2.3	D_{GRF} (-) =	NA

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	3.0E-11
dt_2 (min) =	NA	C_D (-) =	3.3E-03
T_T (m^2/s) =	3.7E-07	ξ (-) =	21.3
S (-) =	1.0E-06		
K_s (m/s) =	7.4E-08		
S_s (1/m) =	2.0E-07		

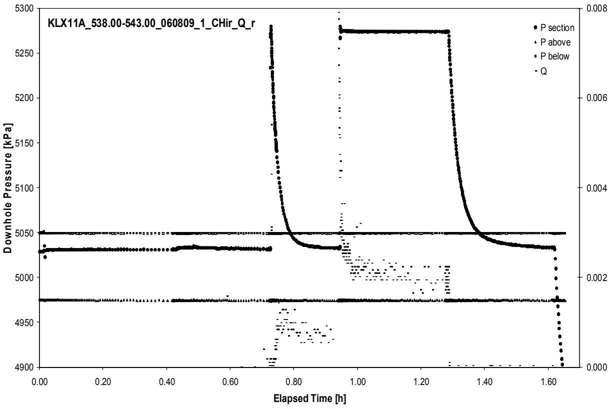
Comments:

The recommended transmissivity of 3.7E-7 m2/s was derived from the radial flow analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9.0E-8 to 6.0E-7 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,980.7 kPa.

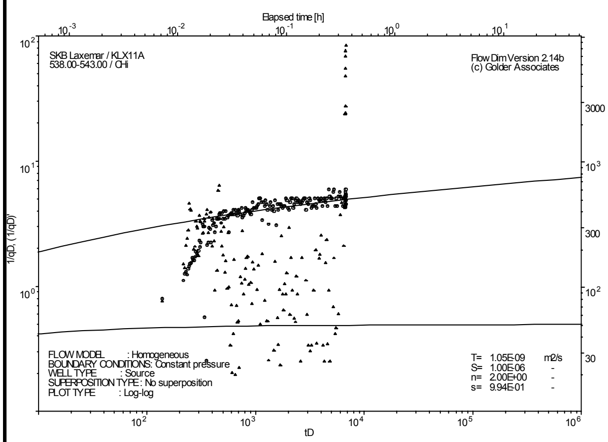
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060809 14:40
Test section from - to (m):	538.00-543.00	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

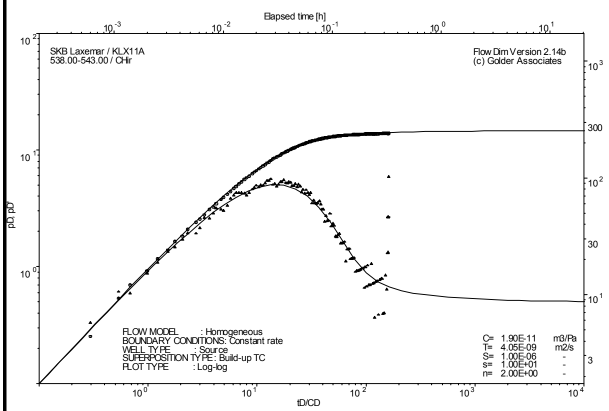
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5028		
p_i (kPa) =	5032		
p_p(kPa) =	5274	p_F (kPa) =	5032
Q_p (m^3/s)=	3.33E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.7		
Derivative fact.=	0.11	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.4E-09		
T_M (m^2/s)=	1.1E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2.17	dt_1 (min) =	NA
dt_2 (min) =	17.26	dt_2 (min) =	NA
T (m^2/s) =	1.1E-09	T (m^2/s) =	4.1E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.1E-10	K_s (m/s) =	8.1E-10
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.9E-11
C_D (-) =	NA	C_D (-) =	2.1E-03
ξ (-) =	1.0	ξ (-) =	10.0
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	1.9E-11
dt_2 (min) =	NA	C_D (-) =	2.1E-03
T_T (m^2/s) =	4.1E-09	ξ (-) =	10.0
S (-) =	1.0E-06		
K_s (m/s) =	8.2E-10		
S_s (1/m) =	2.0E-07		

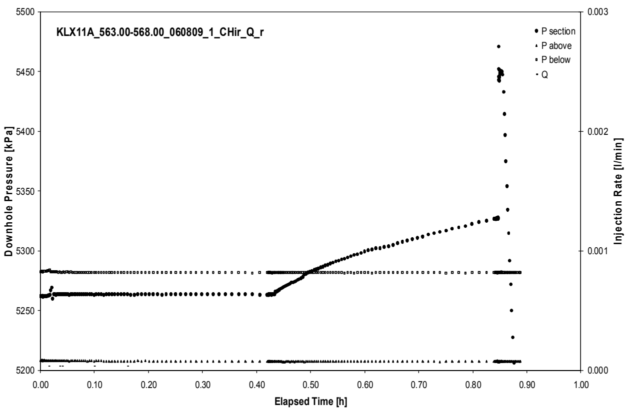
Comments:

The recommended transmissivity of 4.1E-9 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-9 to 1.0E-8 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,028.7 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060809 16:59
Test section from - to (m):	563.00-568.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5262		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.0		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

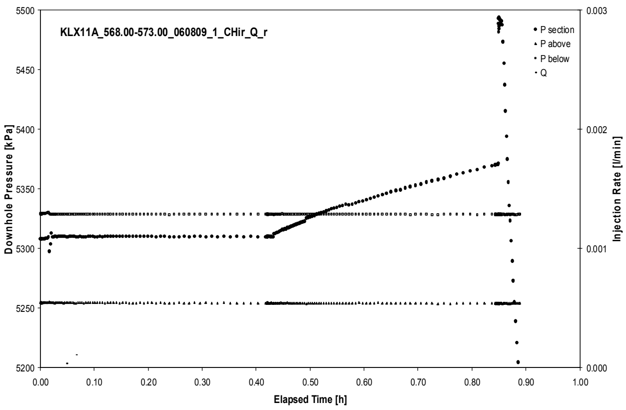
Comments:

Based on the test response (prolonged packer compilance) the interval transmissivity is lower than 1.0E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060809 18:17
Test section from - to (m):	568.00-573.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5308		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.1		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

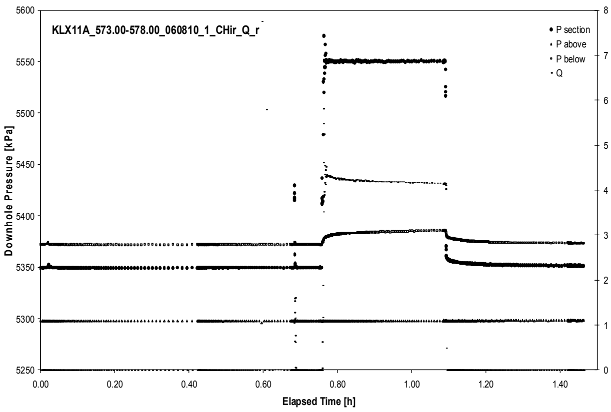
Comments:

Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

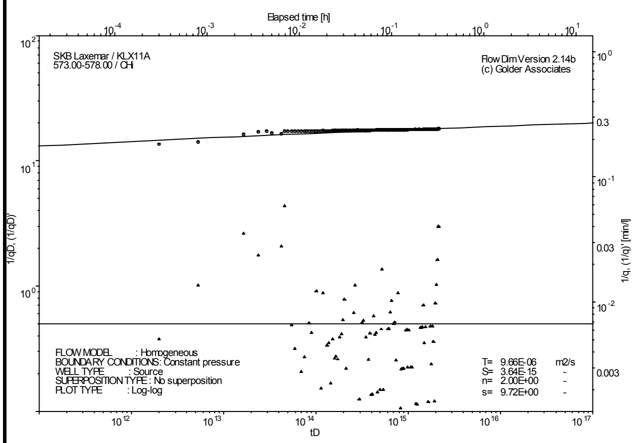
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060810 08:06
Test section from - to (m):	573.00-578.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

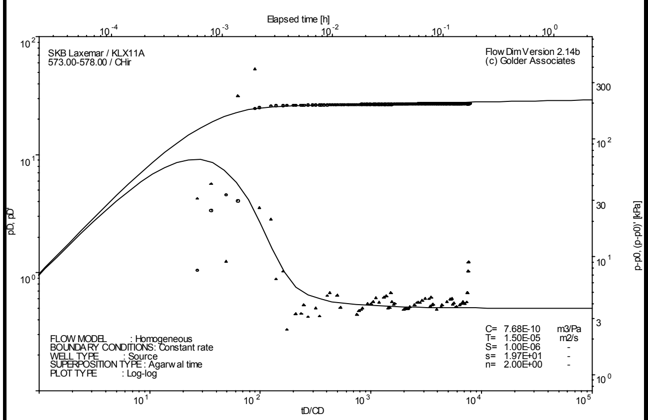
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5349		
p_i (kPa) =	5350		
p_p(kPa) =	5550	p_F (kPa) =	5351
Q_p (m^3/s)=	6.85E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.2		
Derivative fact.=	0.02	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	3.4E-06		
T_M (m^2/s)=	2.8E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.98	dt_1 (min) =	0.53
dt_2 (min) =	16.63	dt_2 (min) =	8.47
T (m^2/s) =	9.7E-06	T (m^2/s) =	1.5E-05
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.9E-06	K_s (m/s) =	3.0E-06
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	7.7E-10
C_D (-) =	NA	C_D (-) =	8.5E-02
ξ (-) =	9.7	ξ (-) =	19.7
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.			
dt_1 (min) =	0.53	C (m^3/Pa) =	7.7E-10
dt_2 (min) =	8.47	C_D (-) =	8.5E-02
T_T (m^2/s) =	1.5E-05	ξ (-) =	19.7
S (-) =	1.0E-06		
K_s (m/s) =	3.0E-06		
S_s (1/m) =	2.0E-07		

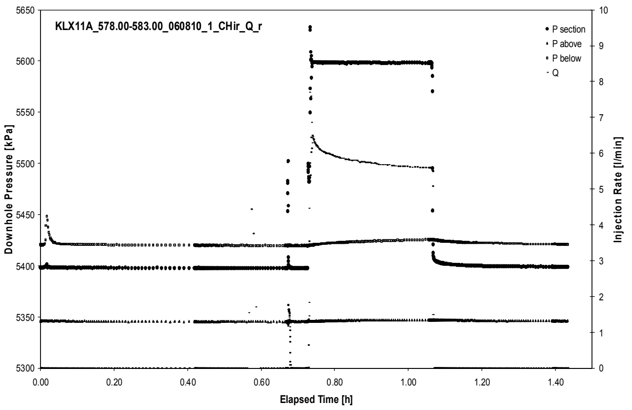
Comments:

The recommended transmissivity of 1.5E-5 m2/s was derived from the radial flow analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-6 to 3.0E-5 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5350.3 kPa.

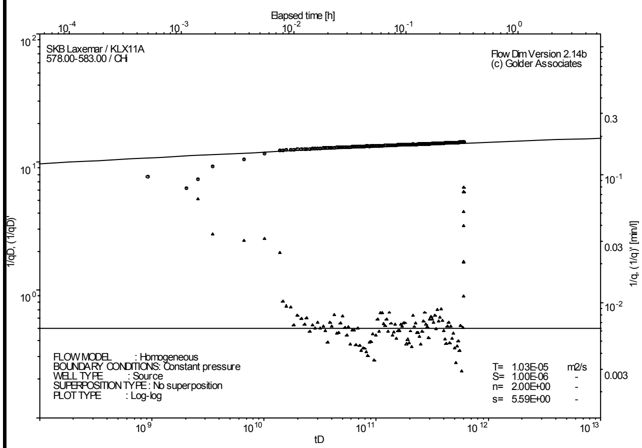
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060810 10:02
Test section from - to (m):	578.00-583.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

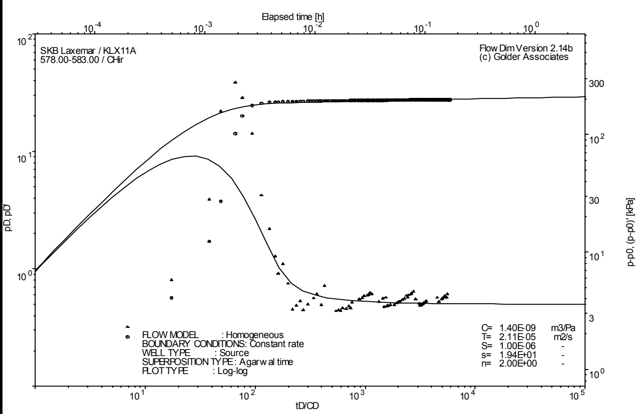
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5398		
p_i (kPa) =	5397		
p_p(kPa) =	5598	p_F (kPa) =	5399
Q_p (m^3/s)=	9.33E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.1		
Derivative fact.=	0.06	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	4.6E-06		
T_M (m^2/s)=	3.8E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.88	dt_1 (min) =	0.58
dt_2 (min) =	15.88	dt_2 (min) =	8.04
T (m^2/s) =	1.0E-05	T (m^2/s) =	2.1E-05
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.0E-06	K_s (m/s) =	4.2E-06
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.4E-09
C_D (-) =	NA	C_D (-) =	1.5E-01
ξ (-) =	5.6	ξ (-) =	19.4
T_{GRF}(m^2/s) =	4.2E-06	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	1.0E-06	S_{GRF}(-) =	NA
D_{GRF} (-) =	2.1	D_{GRF} (-) =	NA

Selected representative parameters.

dt_1 (min) =	0.88	C (m^3/Pa) =	1.4E-09
dt_2 (min) =	15.88	C_D (-) =	1.5E-01
T_T (m^2/s) =	1.0E-05	ξ (-) =	5.6
S (-) =	1.0E-06		
K_s (m/s) =	2.0E-06		
S_s (1/m) =	2.0E-07		

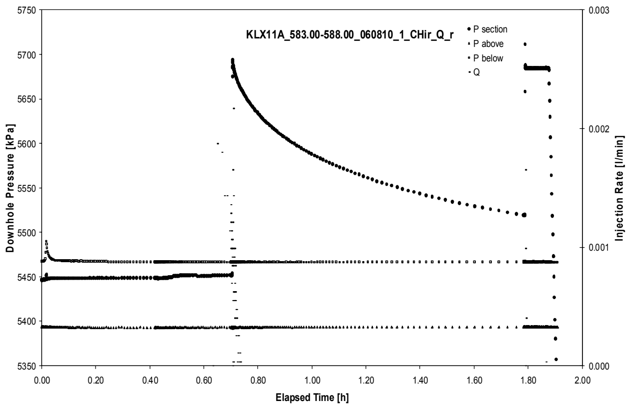
Comments:

The recommended transmissivity of 1.0E-5 m2/s was derived from the radial flow analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-6 to 3.0E-5 m2/s. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5397.7 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060810 12:20
Test section from - to (m):	583.00-588.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

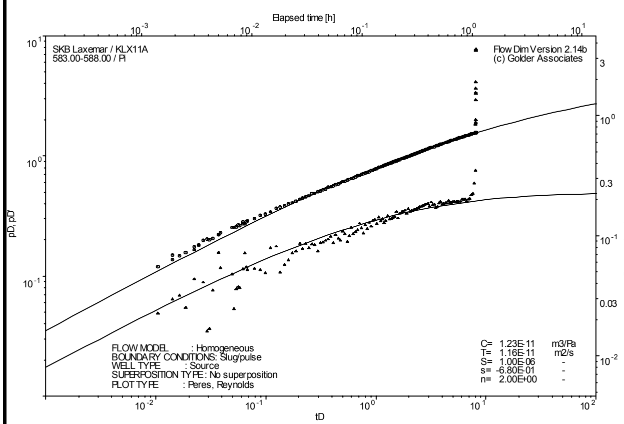


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5447		
p_i (kPa) =	5452		
p_p(kPa) =	5694	p_F (kPa) =	5519
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	3888
S el S^* (-)=	NA	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.4		
Derivative fact.=	NA	Derivative fact.=	0.04
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	1.2E-11
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	2.4E-12
S_s (1/m) =	NA	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.2E-11
C_D (-) =	NA	C_D (-) =	1.3E-03
ξ (-) =	NA	ξ (-) =	-0.7
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	2.6E-10
S_{GRF}(-) =	NA	S_{GRF}(-) =	1.0E-06
D_{GRF} (-) =	NA	D_{GRF} (-) =	1.4

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	1.2E-11
dt_2 (min) =	NA	C_D (-) =	1.3E-03
T_T (m^2/s) =	1.2E-11	ξ (-) =	-0.7
S (-) =	1.0E-06		
K_s (m/s) =	2.4E-12		
S_s (1/m) =	2.0E-07		

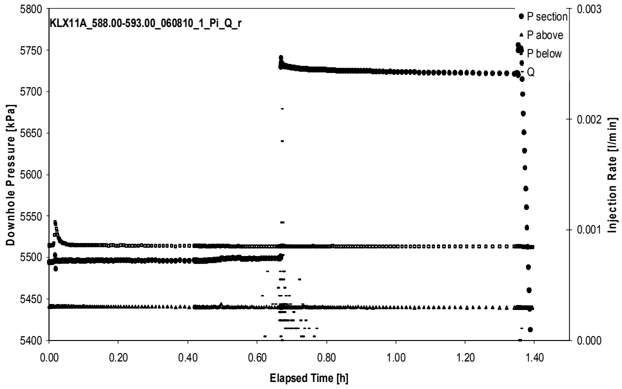
Comments:

The recommended transmissivity of 1.2E-11 m2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 9.0E-12 to 4.0E-11 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060810 14:41
Test section from - to (m):	588.00-593.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5493		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	NA	t_F (s) =	NA
S el S^* (-)=	NA	S el S^* (-)=	NA
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.4		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	NA
dt_2 (min) =	NA	C_D (-) =	NA
T_T (m^2/s) =	NA	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

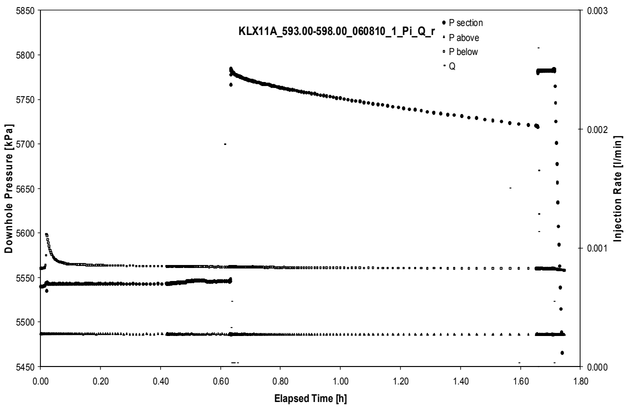
Comments:

Based on the test response the interval transmissivity is lower than 1.0E 11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060810 16:33
Test section from - to (m):	593.00-598.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

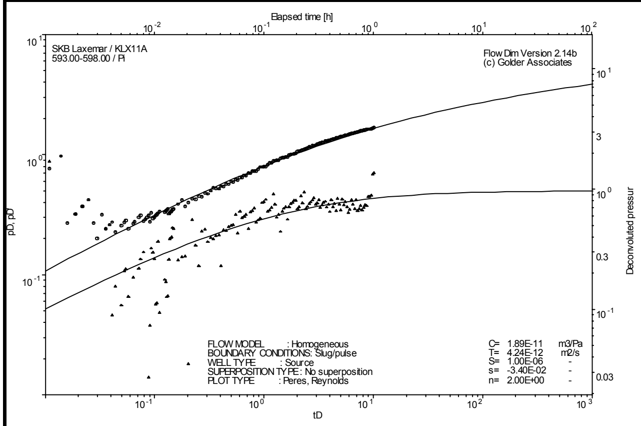


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5540		
p_i (kPa) =	5546		
p_p(kPa) =	5784	p_F (kPa) =	5719
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	3679.2
S el S^* (-)=	NA	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.5		
Derivative fact.=	NA	Derivative fact.=	0.06
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	4.2E-12
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	8.4E-13
S_s (1/m) =	NA	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.9E-11
C_D (-) =	NA	C_D (-) =	2.1E-03
ξ (-) =	NA	ξ (-) =	0.0
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	1.9E-11
dt_2 (min) =	NA	C_D (-) =	2.1E-03
T_T (m^2/s) =	4.2E-12	ξ (-) =	0.0
S (-) =	1.0E-06		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

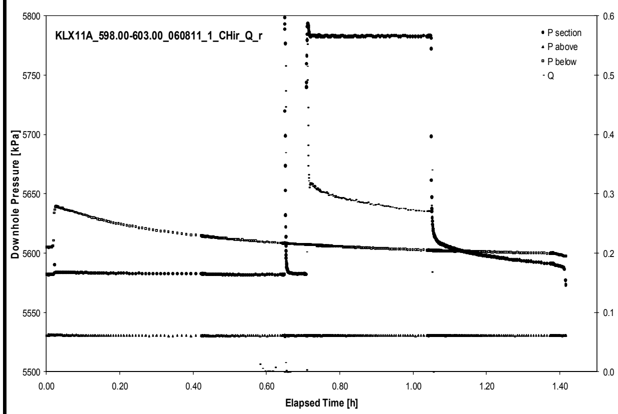
Comments:

The recommended transmissivity of 4.2E-12 m2/s was derived from the radial flow analysis of the PI phase. The confidence range for the interval transmissivity is estimated to be 1.0E-12 to 7.0E-12 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

Test Summary Sheet

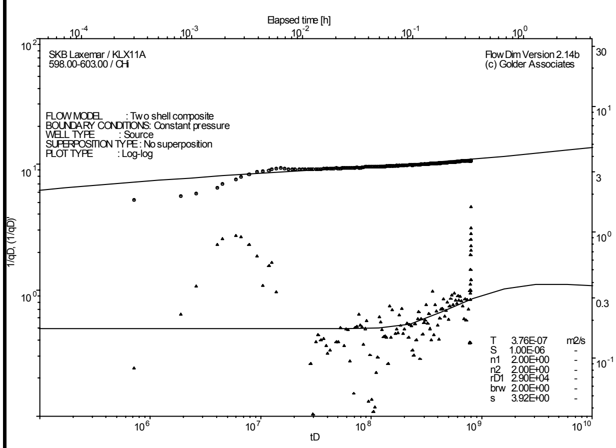
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060811 08:01
Test section from - to (m):	598.00-603.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

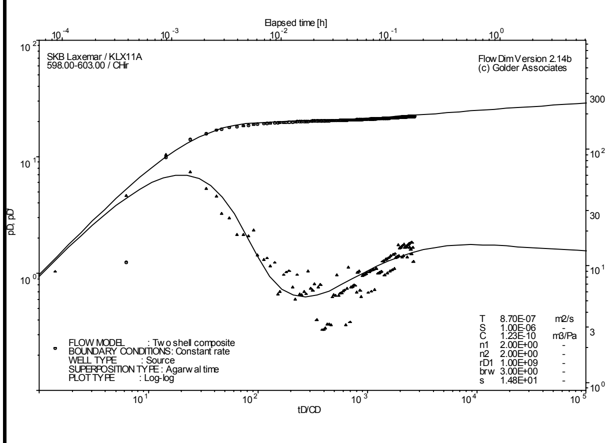


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5582		
p_i (kPa) =	5582		
p_p(kPa) =	5782	p_F (kPa) =	5586
Q_p (m^3/s)=	4.48E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.6		
Derivative fact.=	0.05	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	2.2E-07		
T_M (m^2/s)=	1.8E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.83	dt_1 (min) =	NA
dt_2 (min) =	4.65	dt_2 (min) =	NA
T (m^2/s) =	3.8E-07	T (m^2/s) =	8.7E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	7.6E-08	K_s (m/s) =	1.7E-07
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.2E+10
C_D (-) =	NA	C_D (-) =	1.4E+18
ξ (-) =	3.9	ξ (-) =	14.8
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	0.83	C (m^3/Pa) =	1.2E+10
dt_2 (min) =	4.65	C_D (-) =	1.4E+18
T_T (m^2/s) =	3.8E-07	ξ (-) =	3.9
S (-) =	1.0E-06		
K_s (m/s) =	7.6E-08		
S_s (1/m) =	2.0E-07		

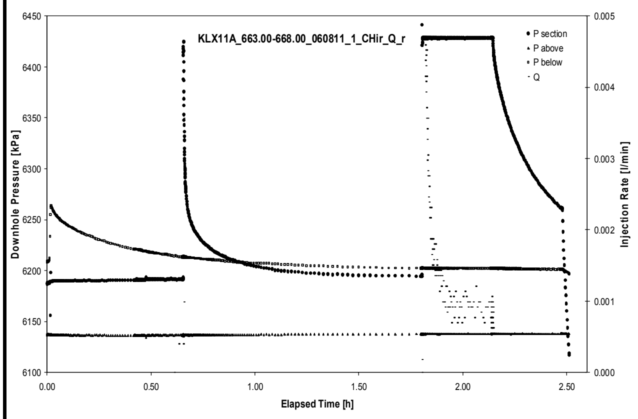
Comments:

The recommended transmissivity of 3.8E-07 m2/s was derived from the radial flow analysis of the CHi phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9.0E-08 to 9.0E-07 m2/s (this range includes the derived transmissivity from the CHir phase). The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,583.6 kPa.

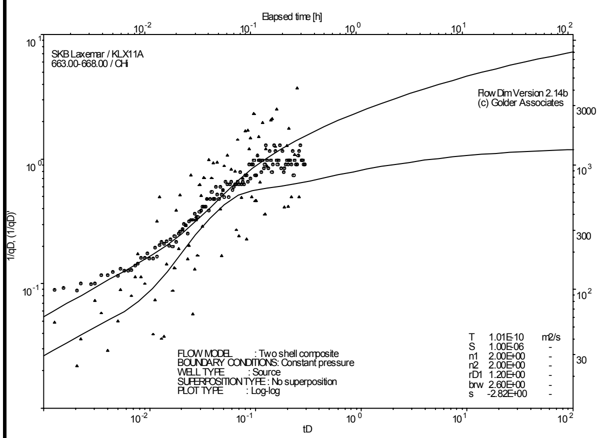
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060811 10:29
Test section from - to (m):	663.00-668.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

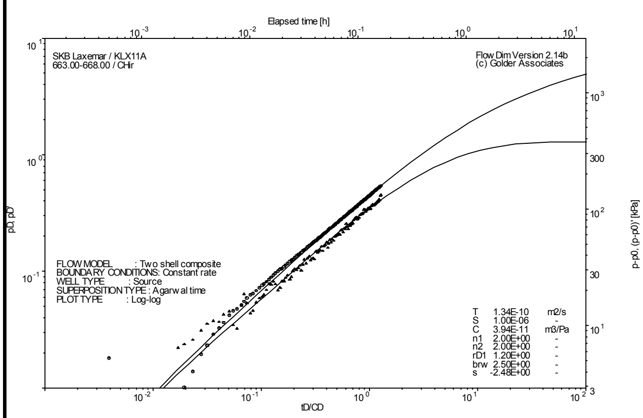
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6188		
p_i (kPa) =	6196		
p_p(kPa) =	6428	p_F (kPa) =	6261
Q_p (m^3/s)=	1.67E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16.5		
Derivative fact.=	0.02	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	7.0E-10		
T_M (m^2/s)=	5.8E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	1.0E-10	T (m^2/s) =	1.3E-10
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.0E-11	K_s (m/s) =	2.7E-11
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.9E-11
C_D (-) =	NA	C_D (-) =	4.3E-03
ξ (-) =	-2.8	ξ (-) =	-2.5
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	3.9E-11
dt_2 (min) =	NA	C_D (-) =	4.3E-03
T_T (m^2/s) =	1.3E-10	ξ (-) =	-2.5
S (-) =	1.0E-06		
K_s (m/s) =	2.6E-11		
S_s (1/m) =	2.0E-07		

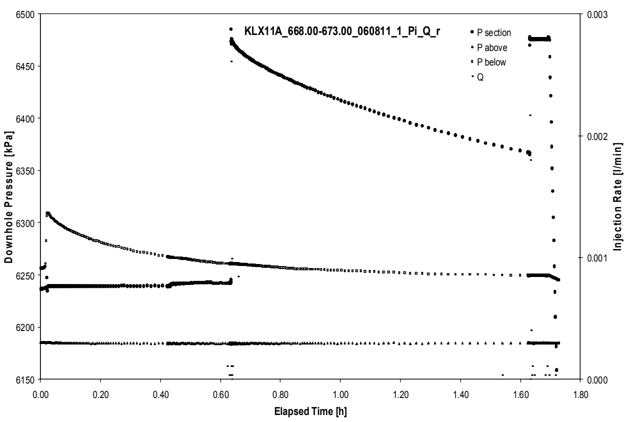
Comments:

The recommended transmissivity of 1.3E-10 m2/s was derived from the radial flow analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-11 to 4.0E-10 m2/s. Due to the low transmissivity no fresh water head was calculated.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060811 13:30
Test section from - to (m):	668.00-673.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

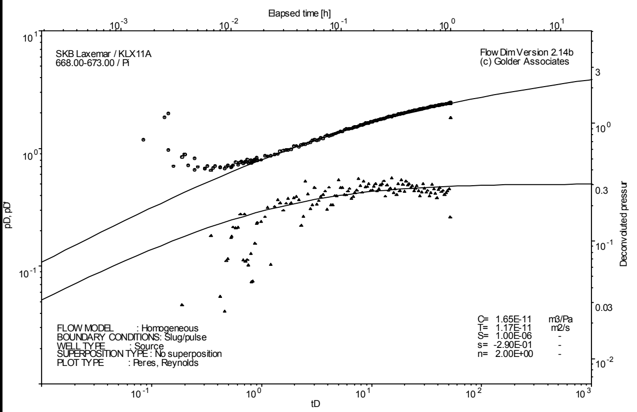


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6237		
p_i (kPa) =	6245		
p_p(kPa) =	6458	p_F (kPa) =	6366
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	3582
S el S* (-)=	NA	S el S* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16.6		
Derivative fact.=	NA	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	6.71
dt_2 (min) =	NA	dt_2 (min) =	42.07
T (m^2/s) =	NA	T (m^2/s) =	1.2E-11
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	2.3E-12
S_s (1/m) =	NA	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.7E-11
C_D (-) =	NA	C_D (-) =	1.8E-03
ξ (-) =	NA	ξ (-) =	-0.3
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	5.67E-11
S_{GRF}(-) =	NA	S_{GRF}(-) =	1.00E-06
D_{GRF} (-) =	NA	D_{GRF} (-) =	1.6

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	6.71	C (m^3/Pa) =	1.7E-11
dt_2 (min) =	42.07	C_D (-) =	1.8E-03
T_T (m^2/s) =	1.2E-11	ξ (-) =	-0.3
S (-) =	1.0E-06		
K_s (m/s) =	2.4E-12		
S_s (1/m) =	2.0E-07		

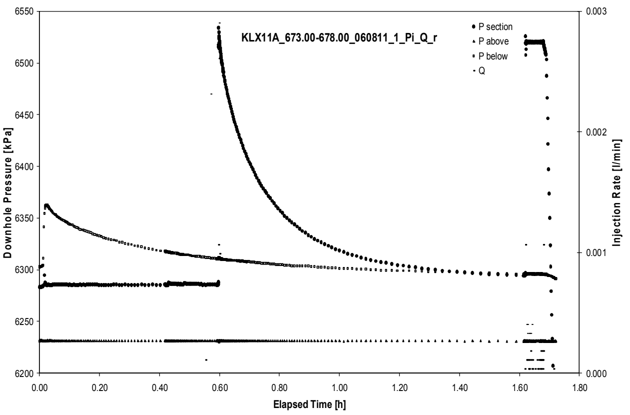
Comments:

The recommended transmissivity of 1.2E-11 m2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 9.0E-12 to 4.0E-11 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060811 15:38
Test section from - to (m):	673.00-678.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

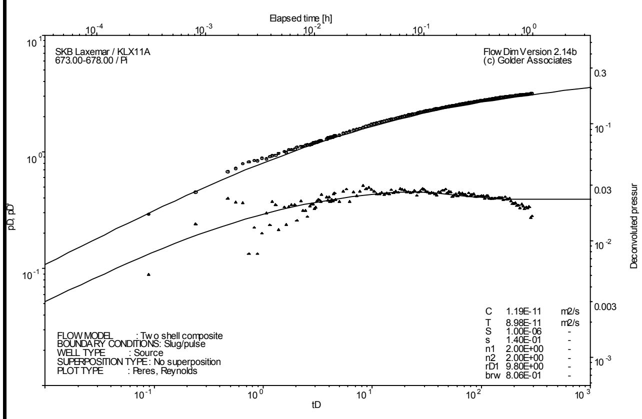


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6283		
p_i (kPa) =	6288		
p_p(kPa) =	6534	p_F (kPa) =	6296
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	3720
S el S^* (-)=	NA	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16.7		
Derivative fact.=	NA	Derivative fact.=	0.06
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	2.36
dt_2 (min) =	NA	dt_2 (min) =	8.90
T (m^2/s) =	NA	T (m^2/s) =	9.0E-11
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	1.8E-11
S_s (1/m) =	NA	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.2E-11
C_D (-) =	NA	C_D (-) =	1.3E-03
ξ (-) =	NA	ξ (-) =	0.1
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	2.36	C (m^3/Pa) =	1.2E-11
dt_2 (min) =	8.90	C_D (-) =	1.3E-03
T_T (m^2/s) =	9.0E-11	ξ (-) =	0.1
S (-) =	1.0E-06		
K_s (m/s) =	1.8E-11		
S_s (1/m) =	2.0E-07		

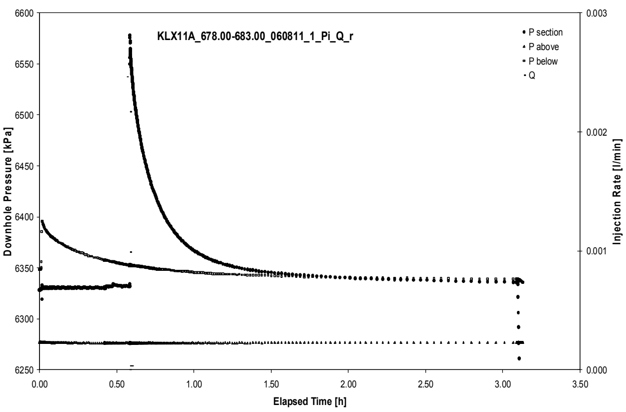
Comments:

The recommended transmissivity of 9.0E-11 m2/s was derived from the radial flow analysis of the PI phase (inner zone). The confidence range for the interval transmissivity is estimated to be 5.0E-11 to 2.0E-10 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX11A	Test start:	060811 17:45
Test section from - to (m):	678.00-683.00 m	Responsible for test execution:	Stephan Rohs
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

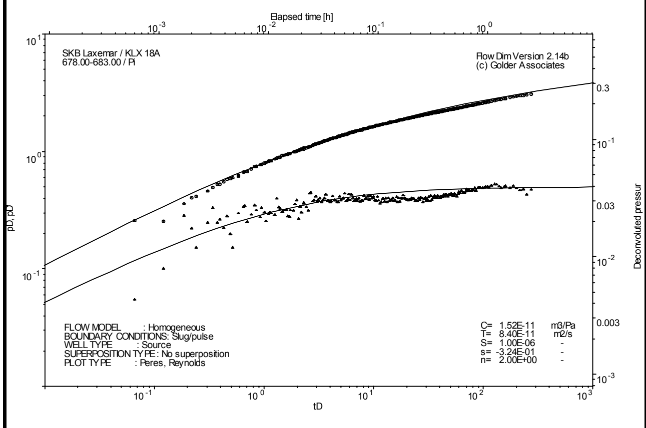


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6329		
p_i (kPa) =	6332		
p_p(kPa) =	6578	p_F (kPa) =	6338
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	9120
S el S* (-)=	NA	S el S* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16.8		
Derivative fact.=	NA	Derivative fact.=	0.04
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	1.95
dt_2 (min) =	NA	dt_2 (min) =	16.97
T (m^2/s) =	NA	T (m^2/s) =	8.4E-11
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	1.7E-11
S_s (1/m) =	NA	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.5E-11
C_D (-) =	NA	C_D (-) =	1.7E-03
ξ (-) =	NA	ξ (-) =	-0.3
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	1.95	C (m^3/Pa) =	1.5E-11
dt_2 (min) =	16.97	C_D (-) =	1.7E-03
T_T (m^2/s) =	8.4E-11	ξ (-) =	-0.3
S (-) =	1.0E-06		
K_s (m/s) =	1.7E-11		
S_s (1/m) =	2.0E-07		

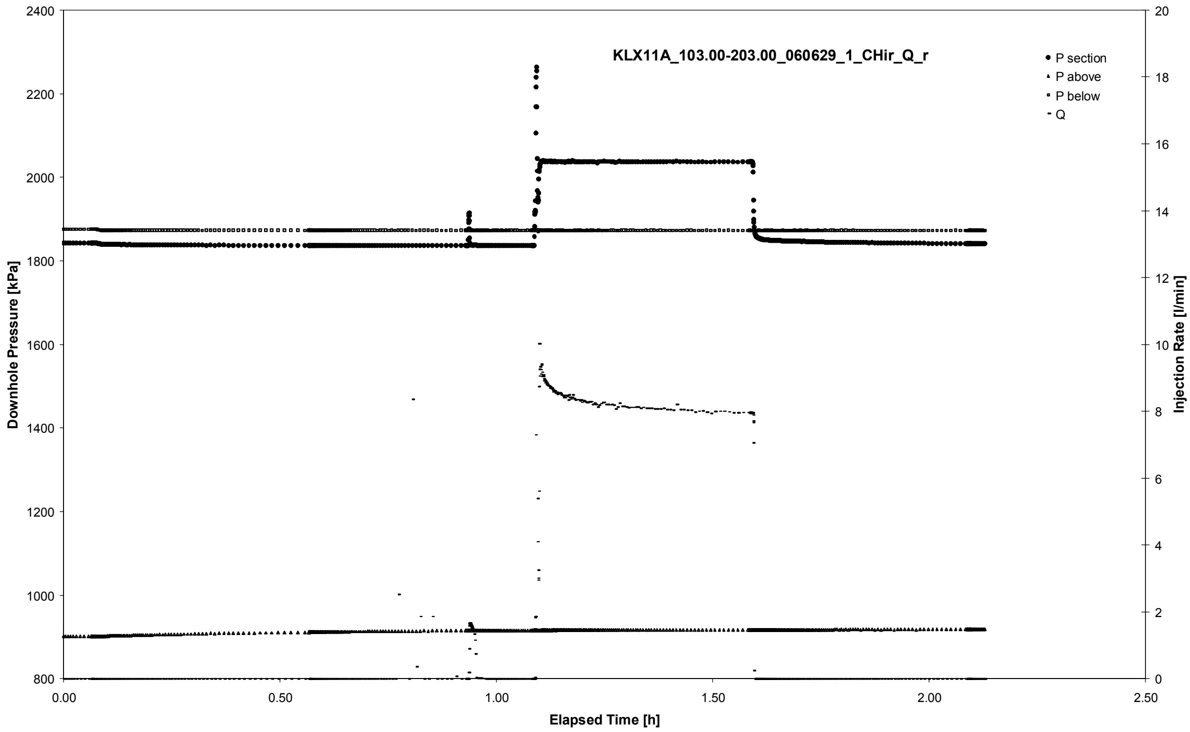
Comments:

The recommended transmissivity of 8.4E-11 m2/s was derived from the radial flow analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 6.0E-11 to 1.0E-10 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

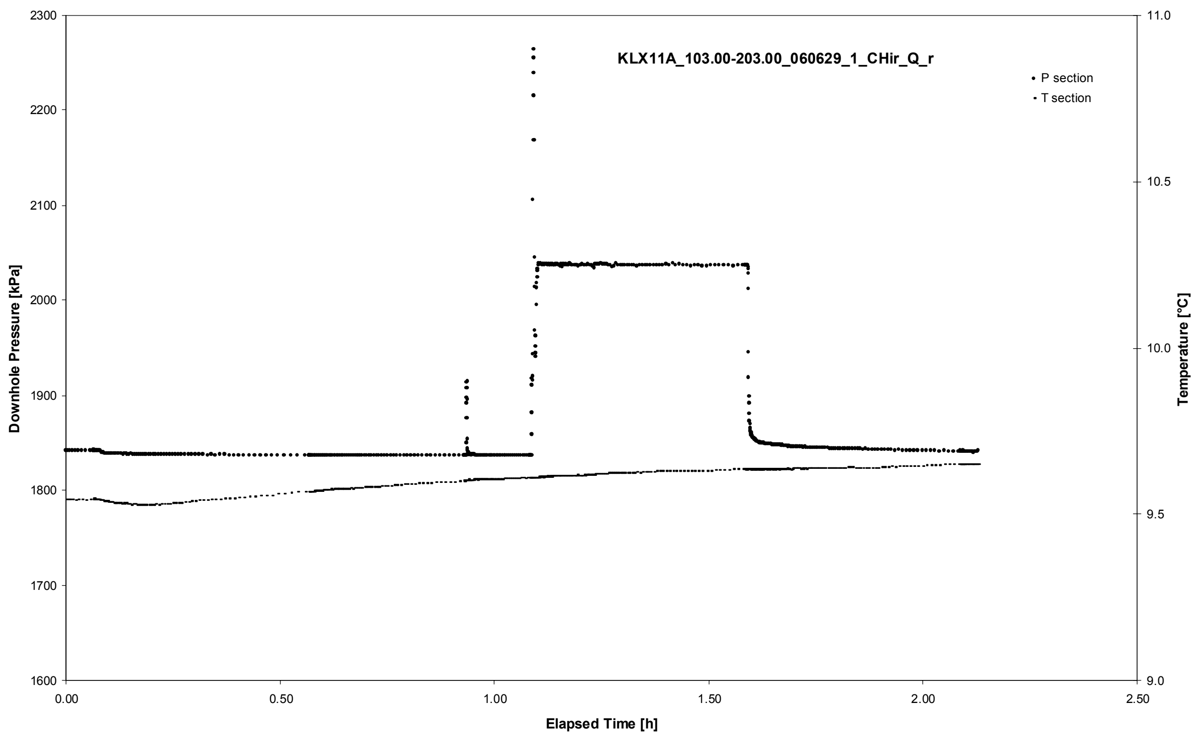
APPENDIX 2-1

Test 103.00 – 203.00 m

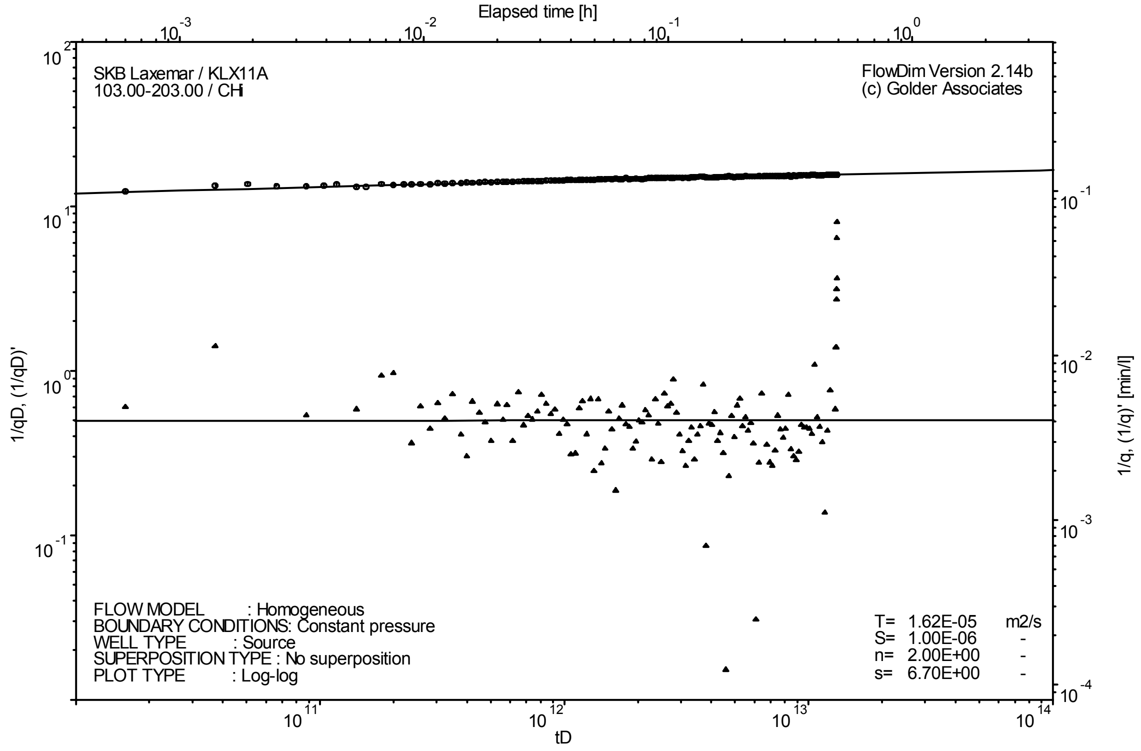
Analysis diagrams



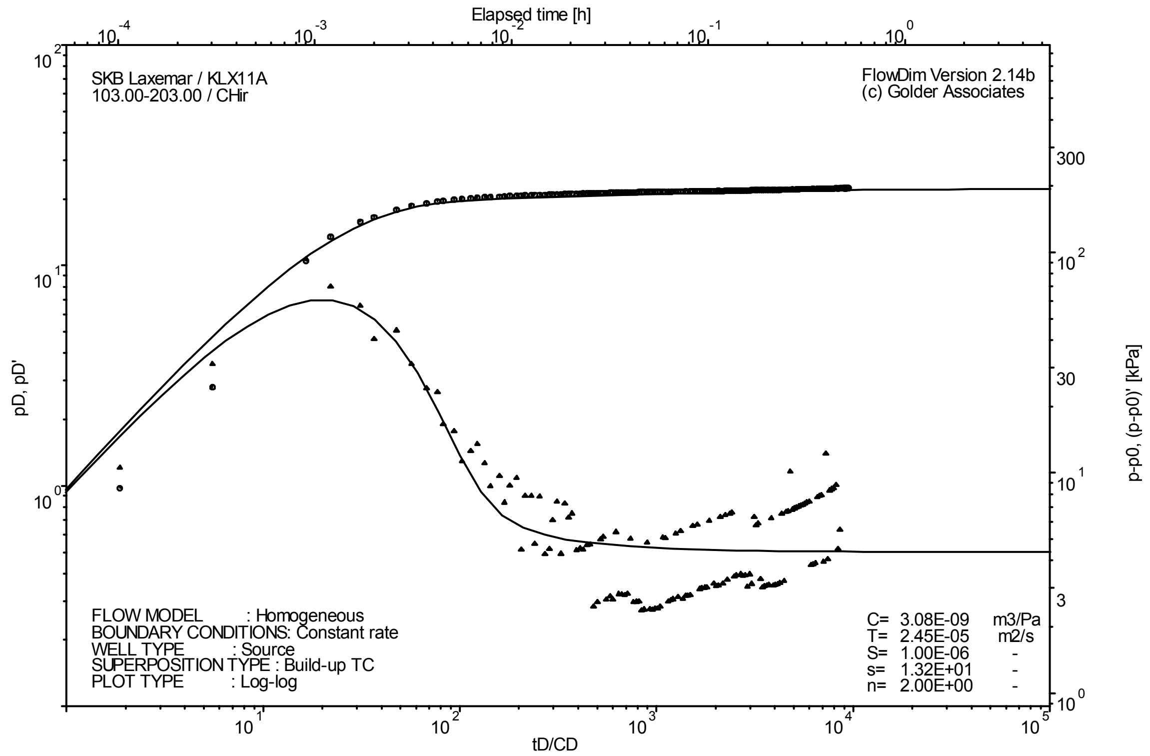
Pressure and flow rate vs. time; cartesian plot



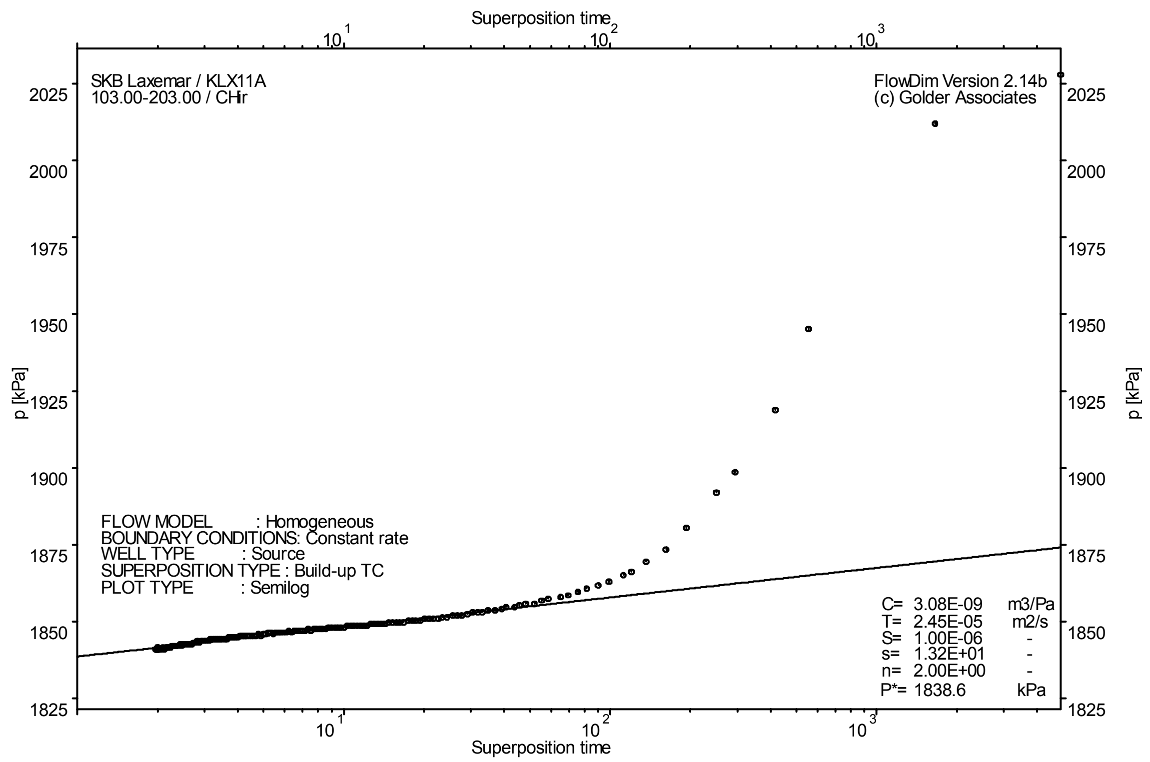
Interval pressure and temperature vs. time; cartesian plot



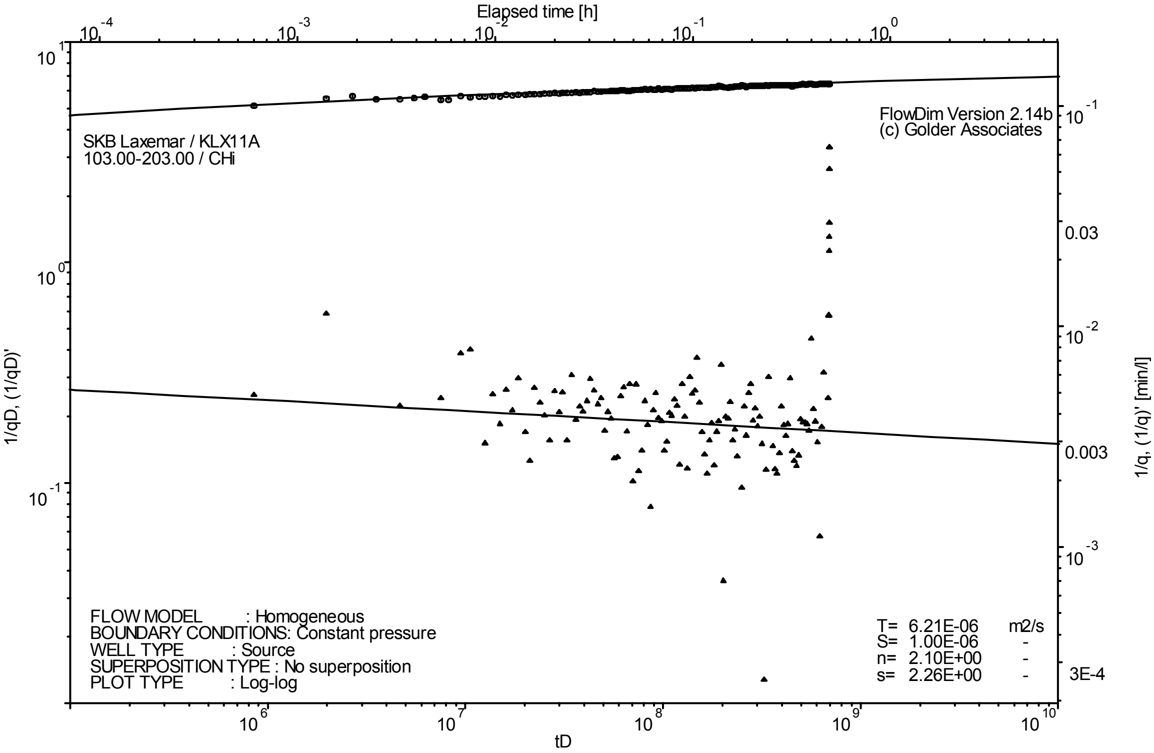
CHI phase; log-log match



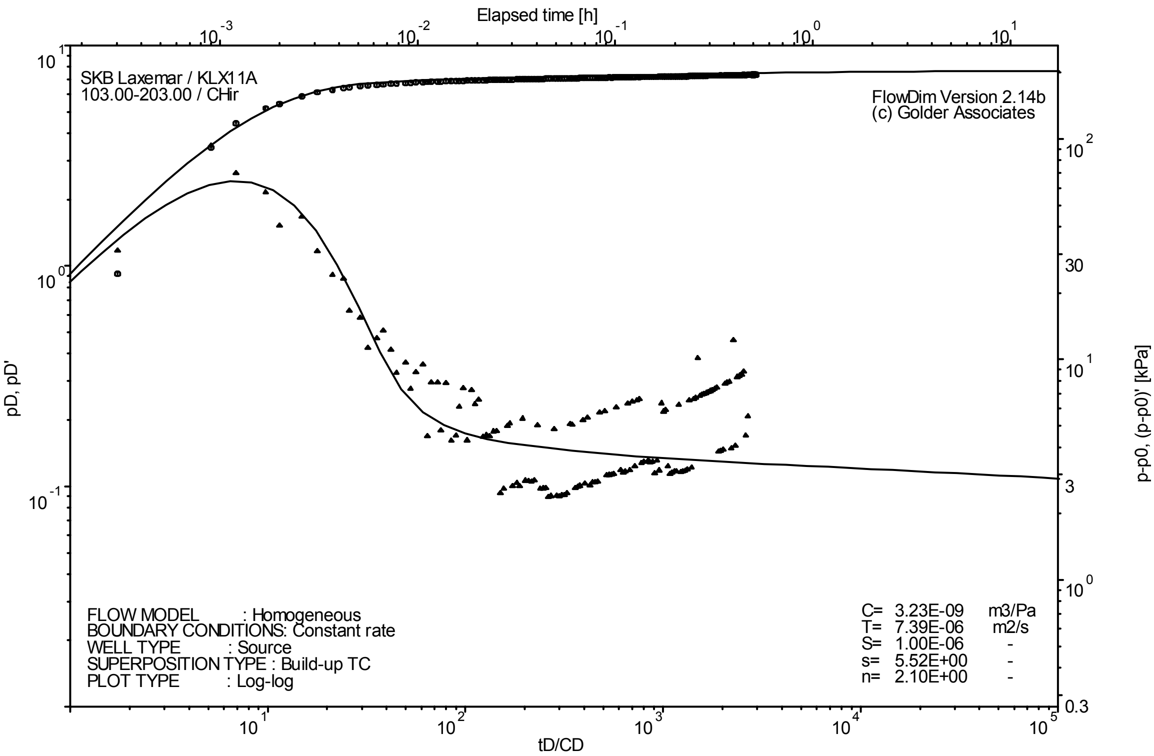
CHIR phase; log-log match



CHIR phase; HORNER match



CHI phase; log-log match (n=2.1)

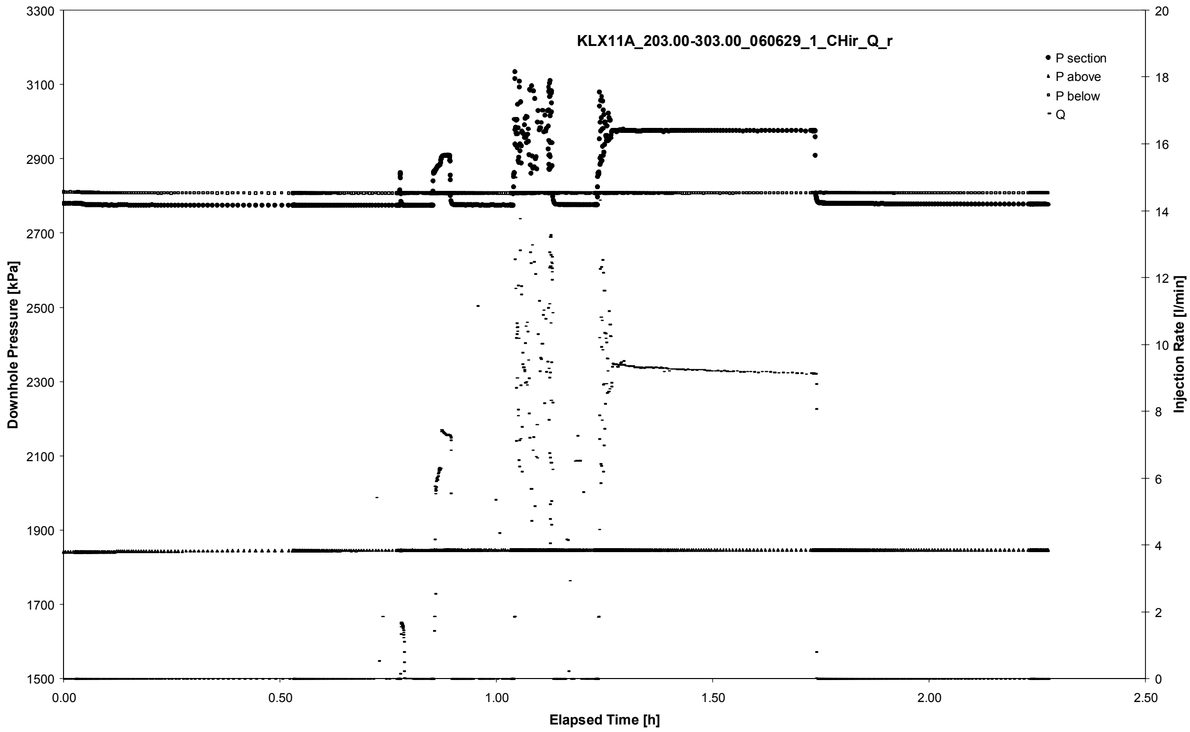


CHIR phase; log-log match (n=2.1)

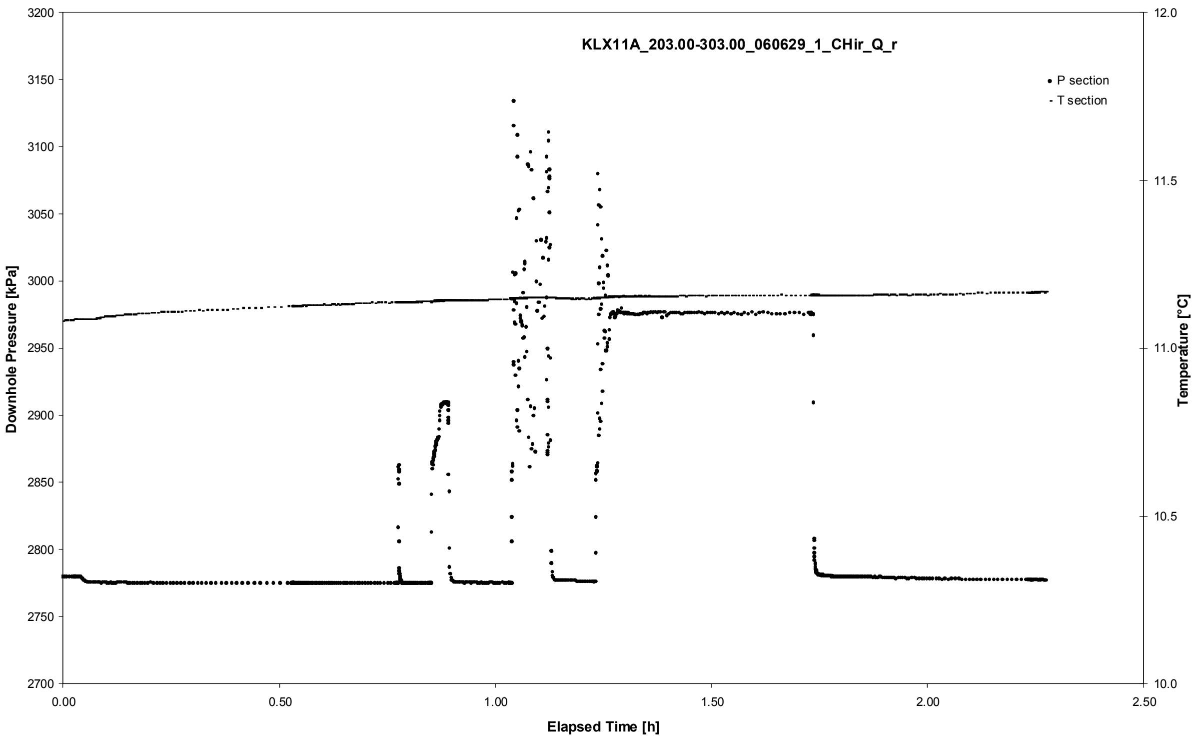
APPENDIX 2-2

Test 203.00 – 303.00 m

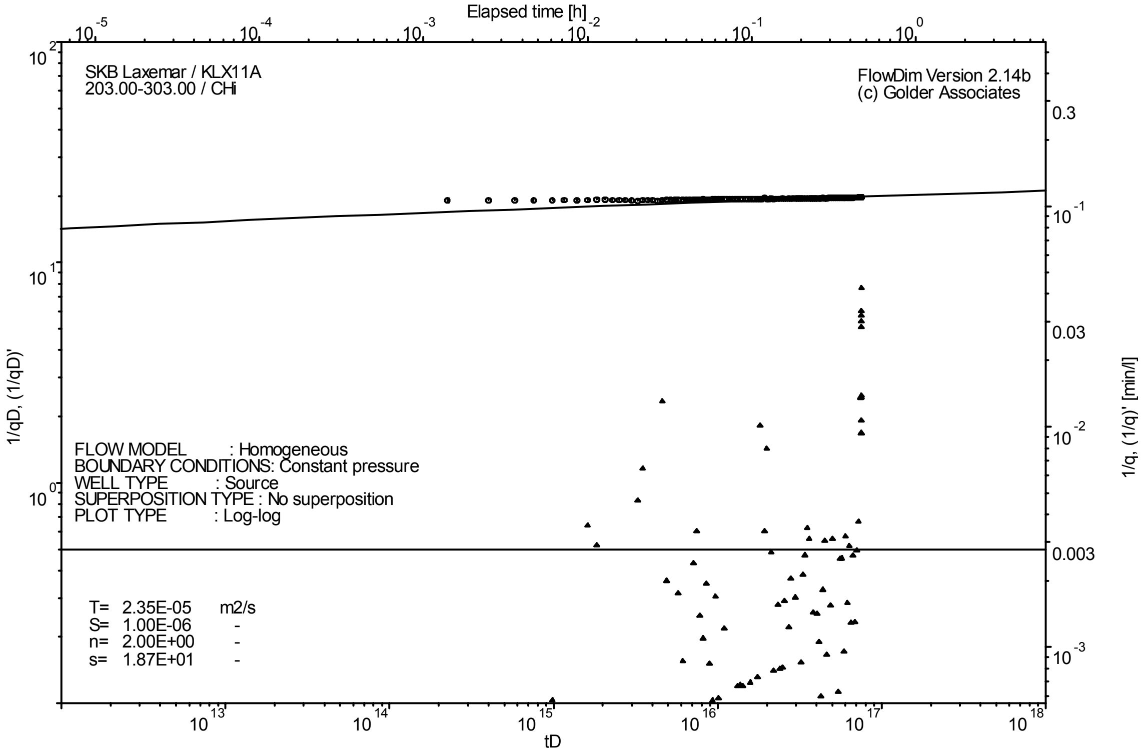
Analysis diagrams



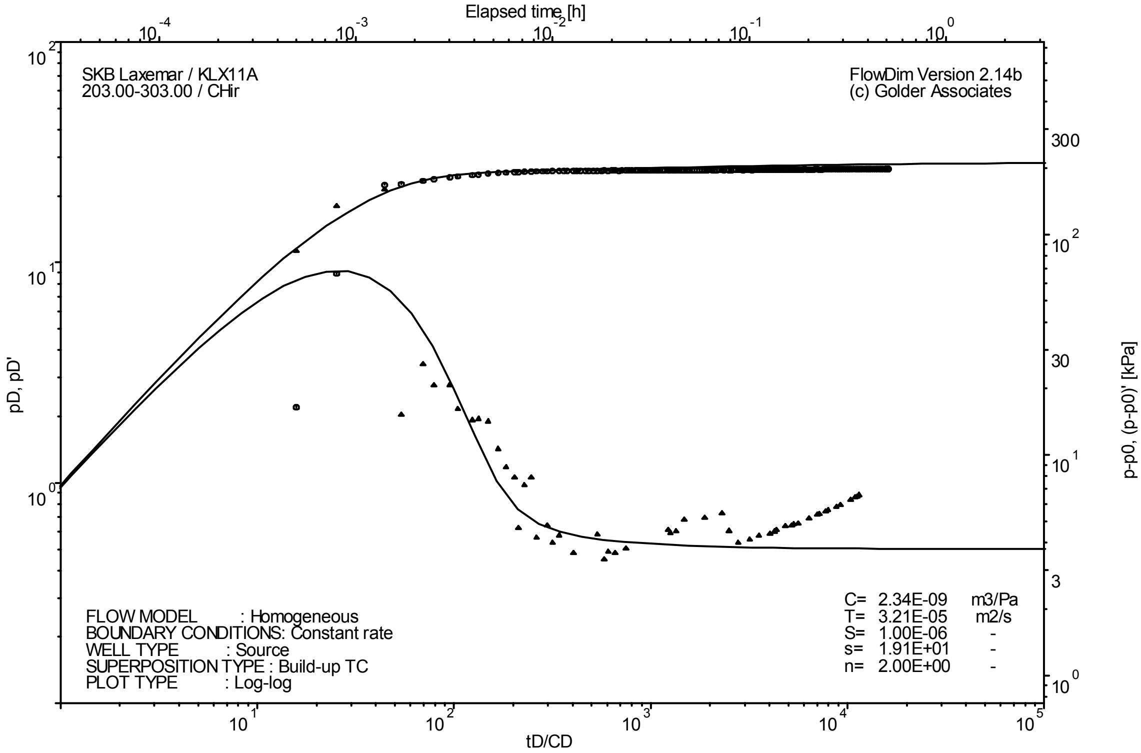
Pressure and flow rate vs. time; cartesian plot



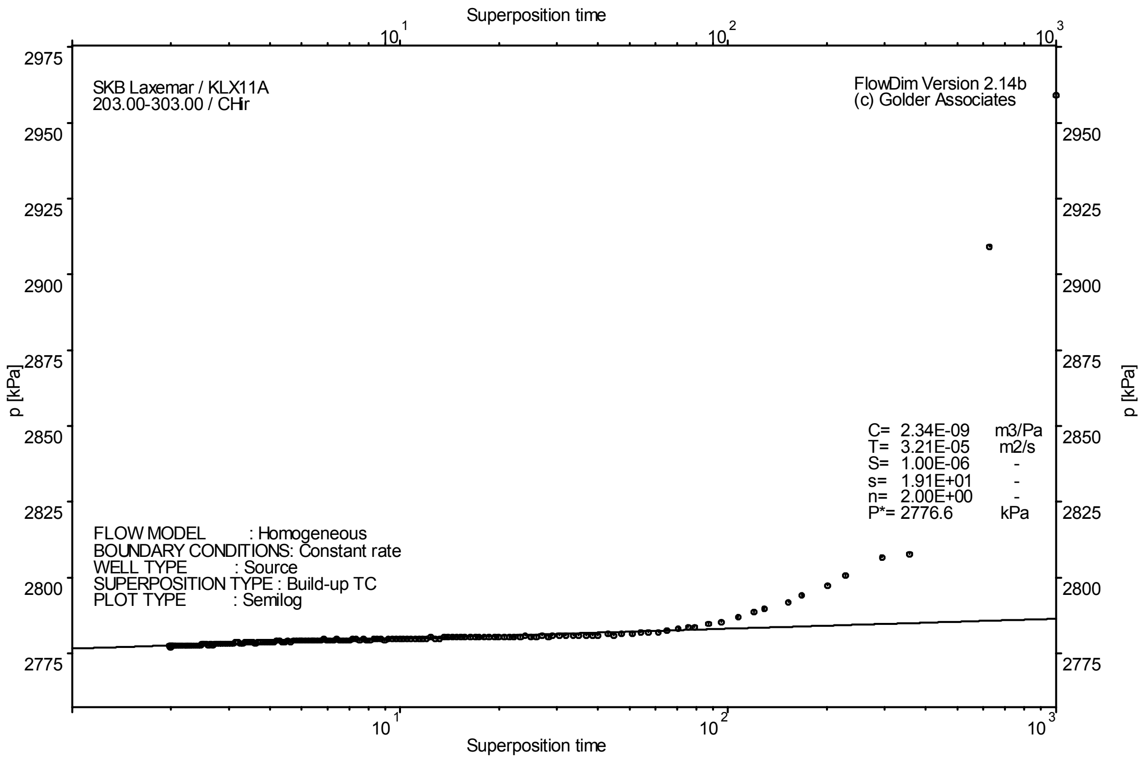
Interval pressure and temperature vs. time; cartesian plot



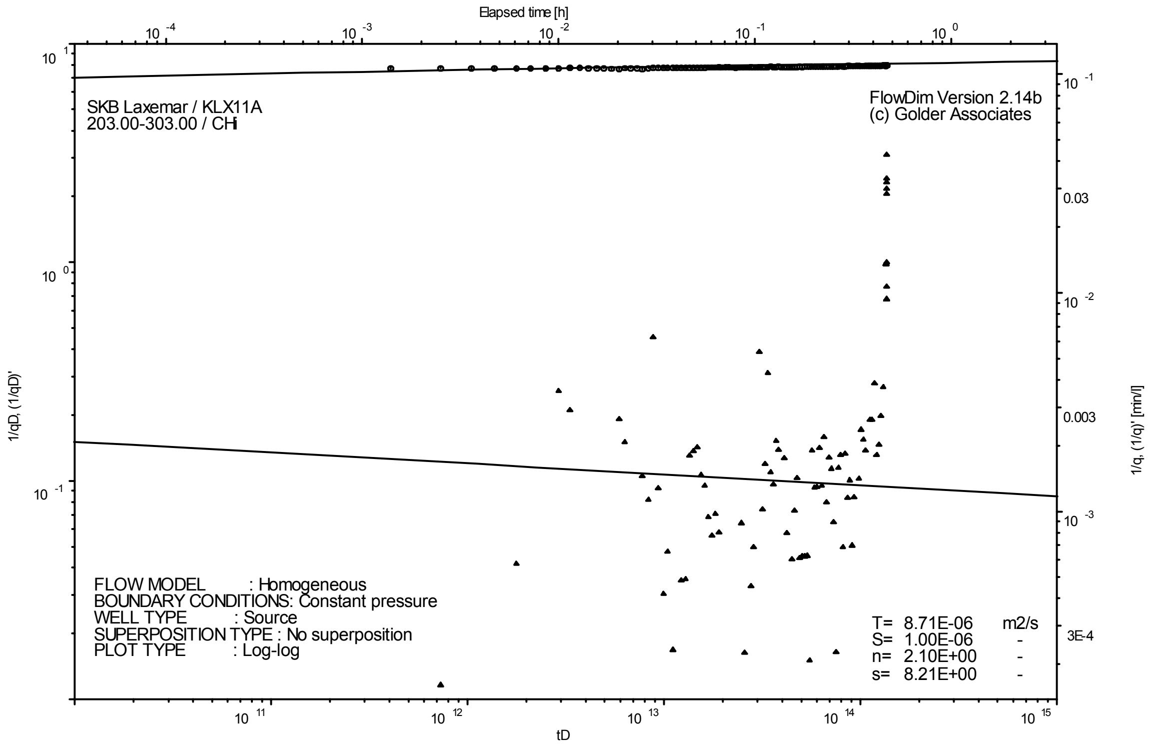
CHI phase; log-log match



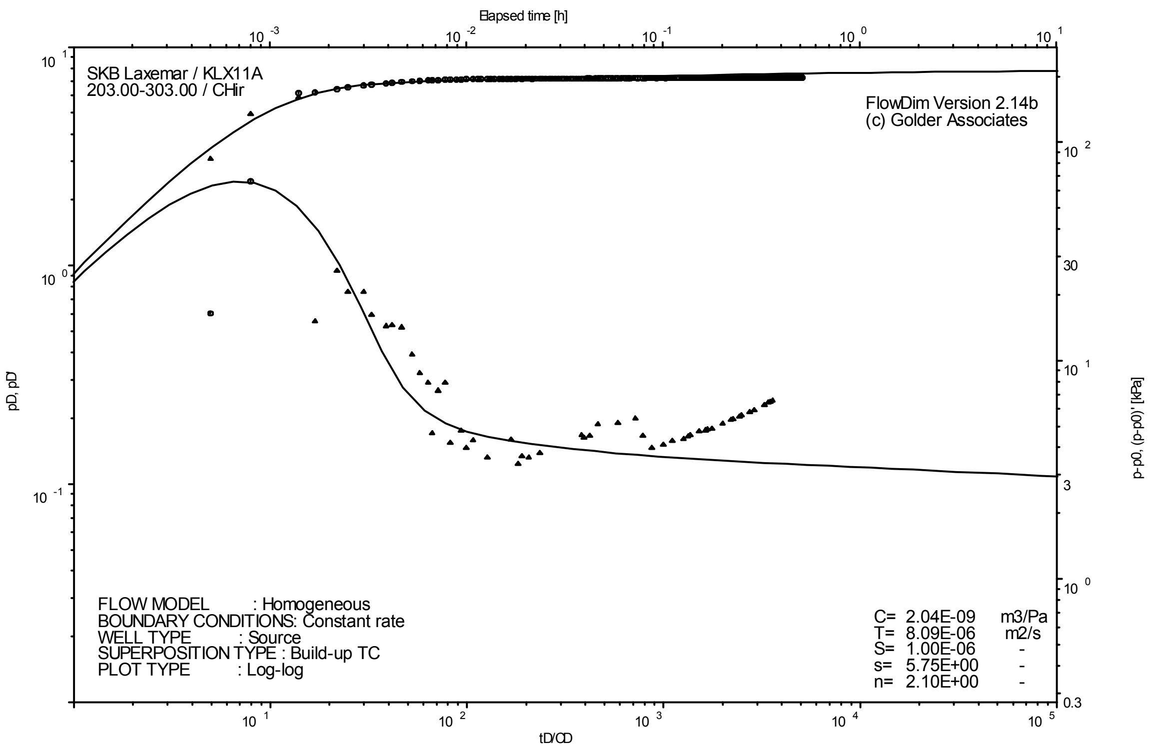
CHIR phase; log-log match



CHIR phase; HORNER match



CHI phase; log-log match (n=2.1)

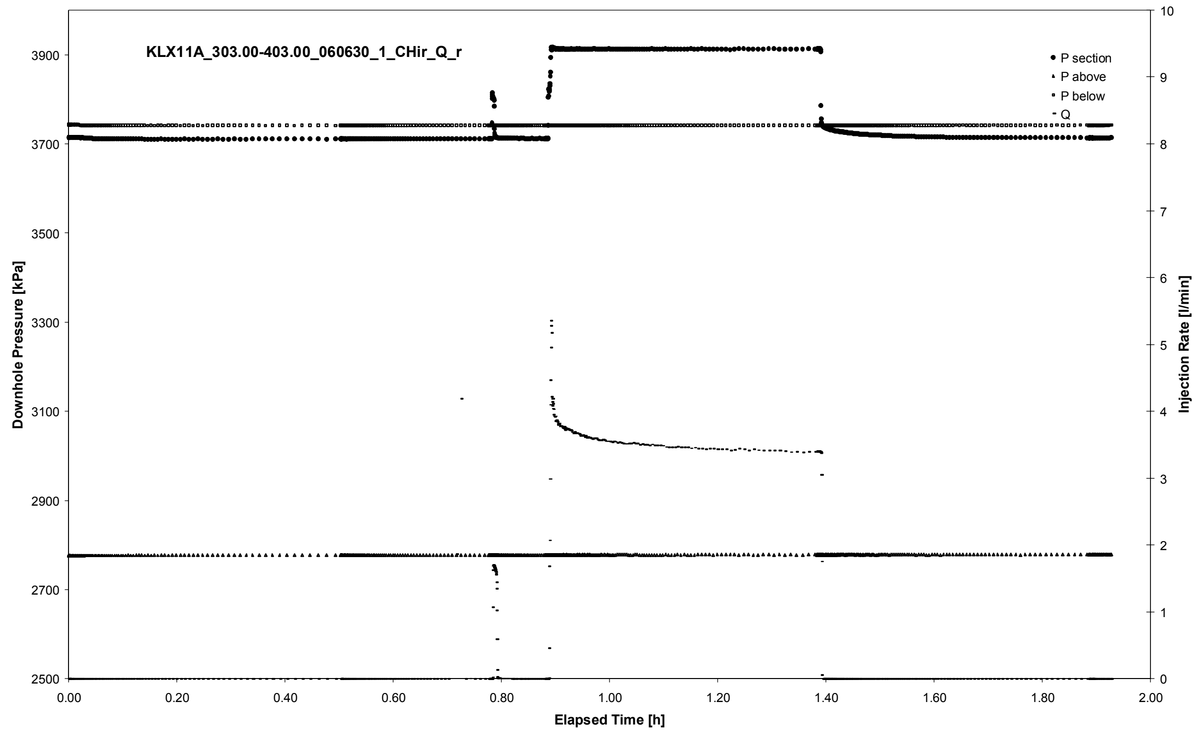


CHIR phase; log-log match (n=2.1)

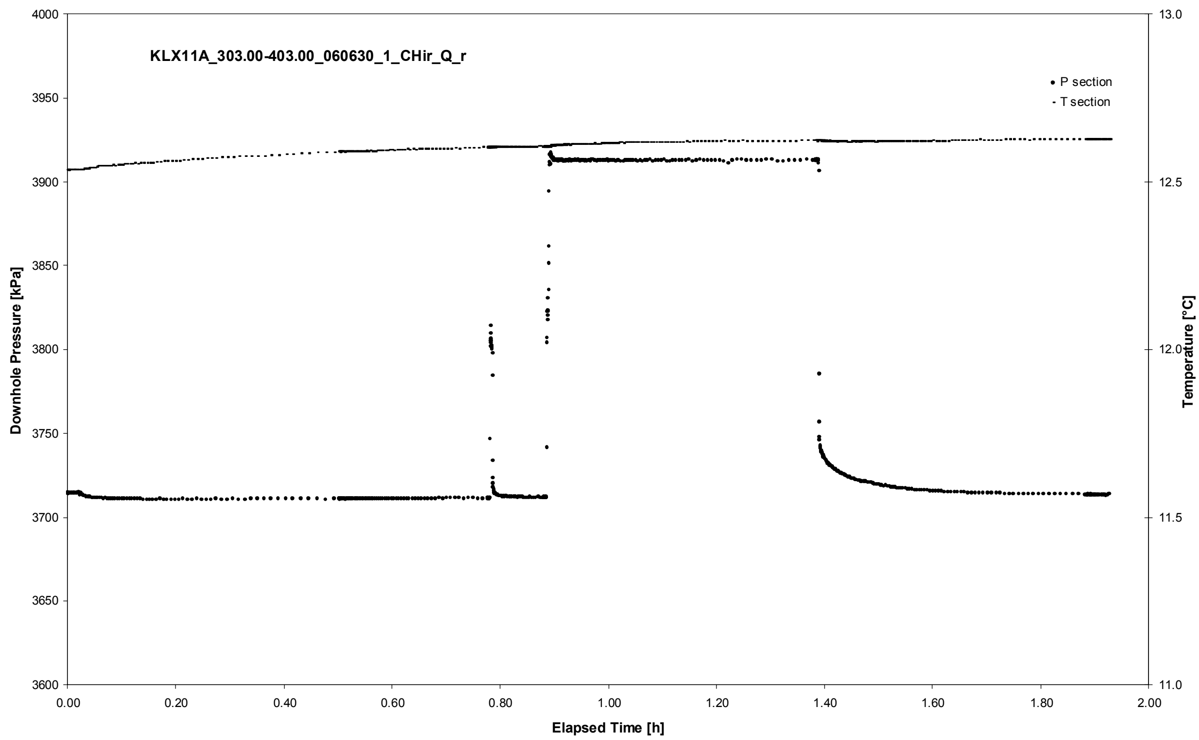
APPENDIX 2-3

Test 303.00 – 403.00 m

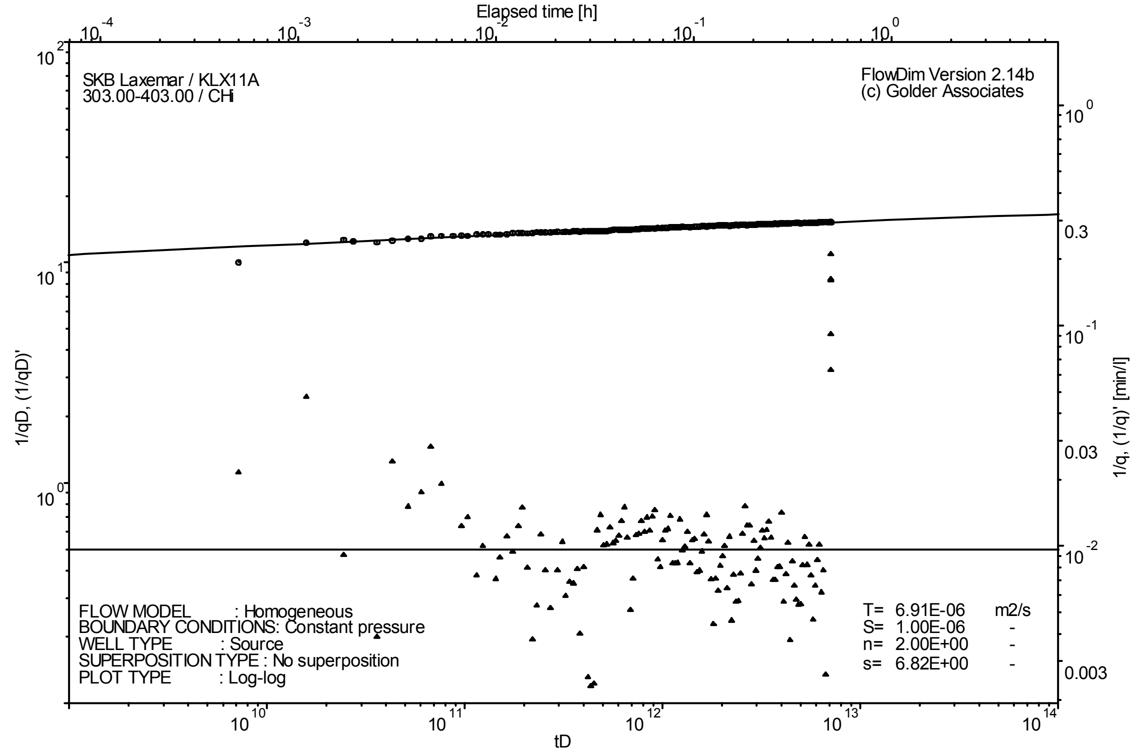
Analysis diagrams



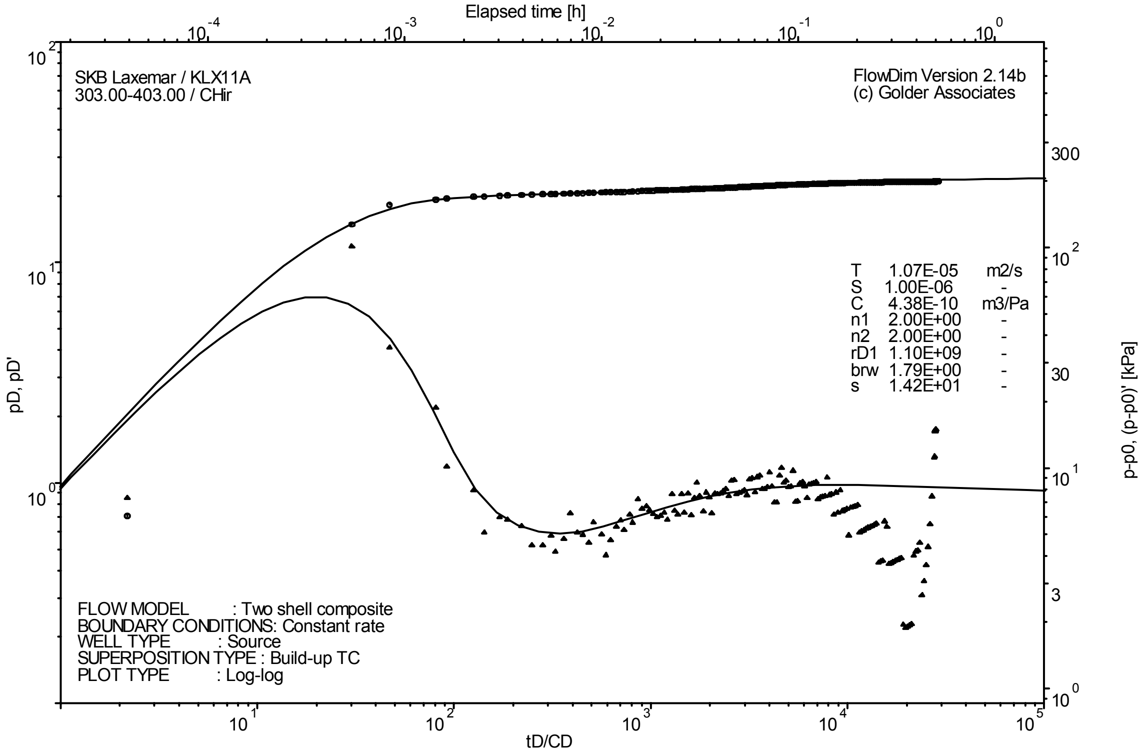
Pressure and flow rate vs. time; cartesian plot



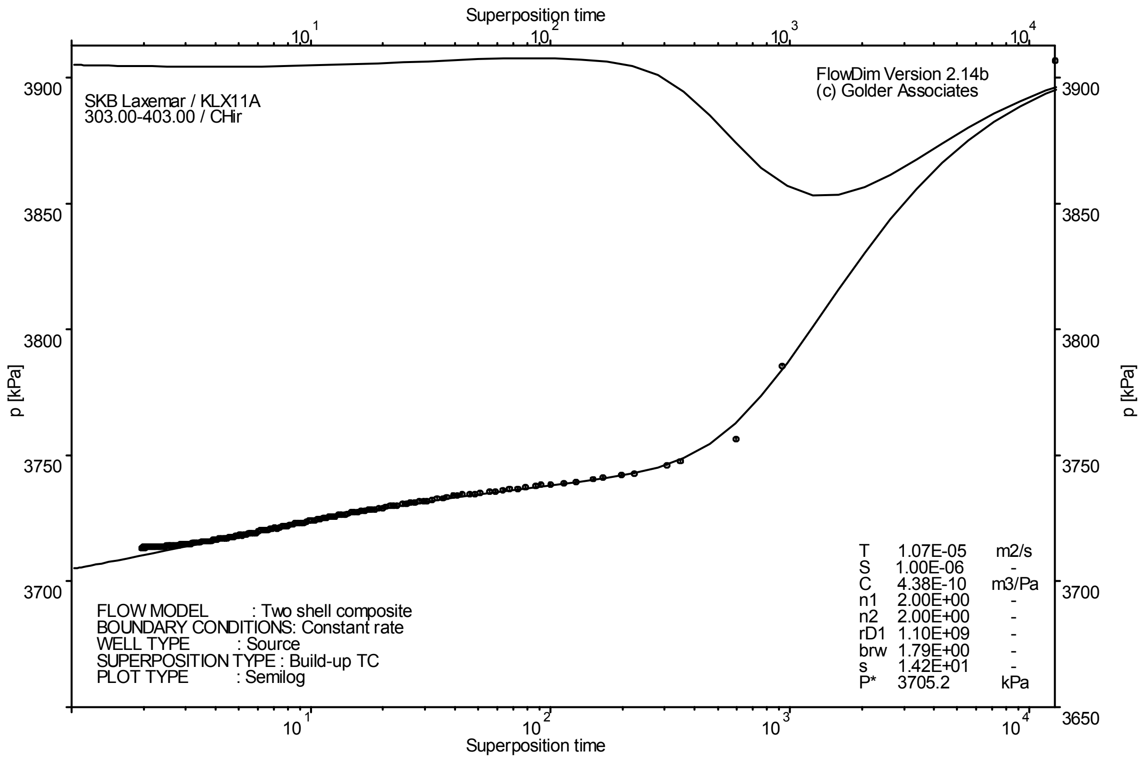
Interval pressure and temperature vs. time; cartesian plot



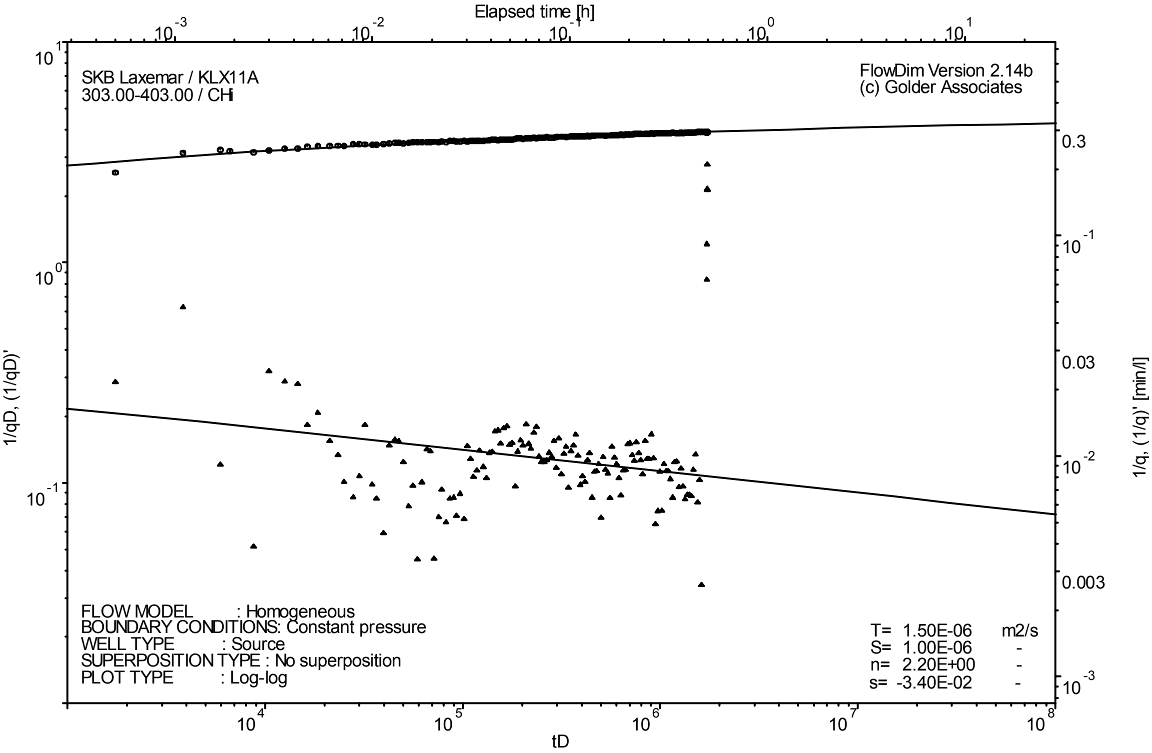
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

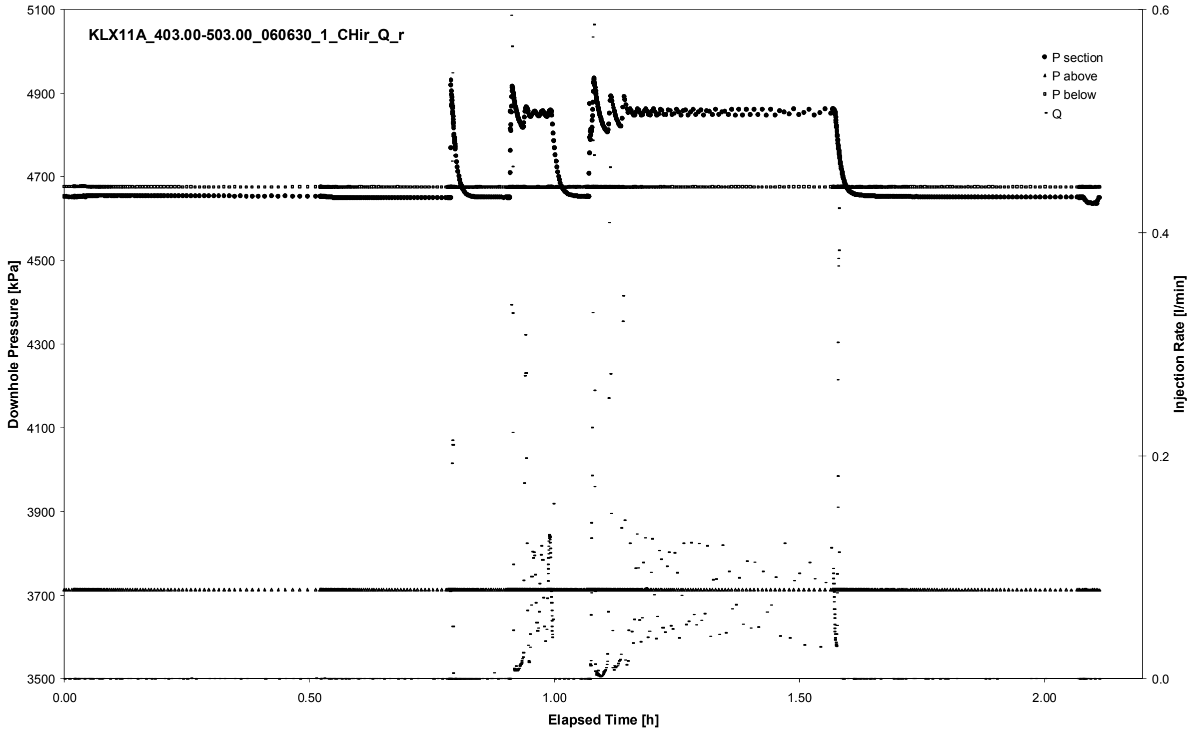


CHI phase; log-log match (n=2.2)

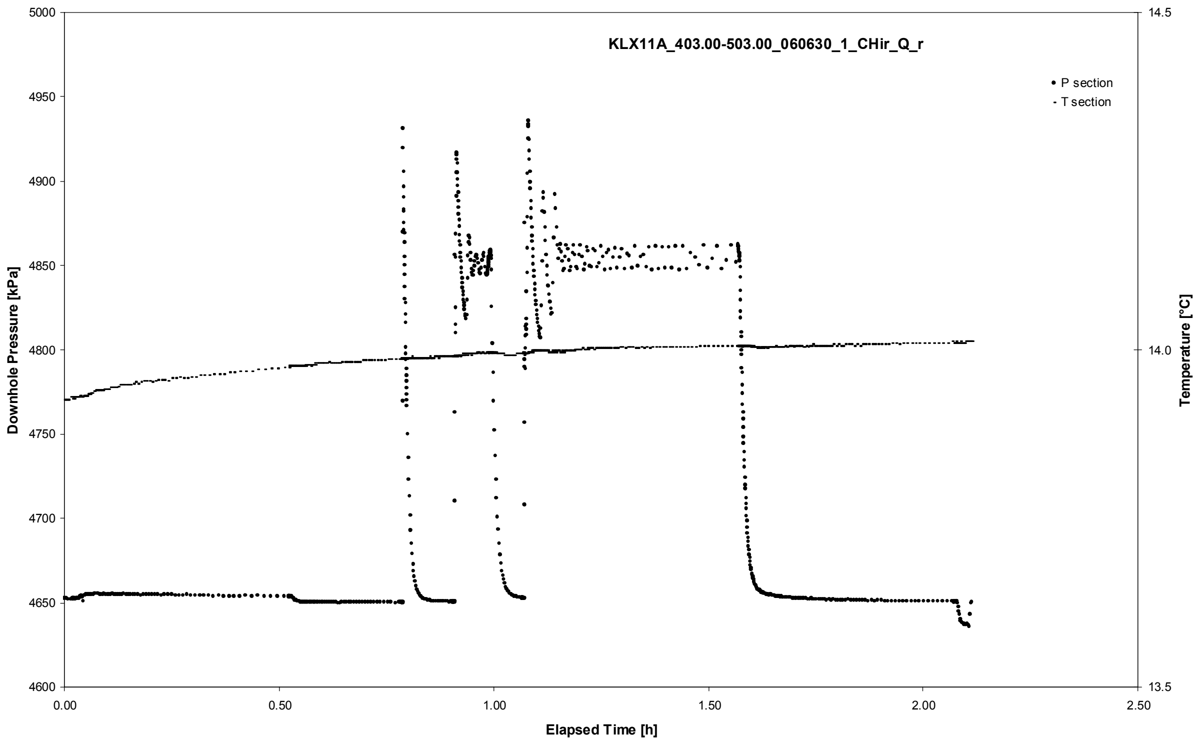
APPENDIX 2-4

Test 403.00 – 503.00 m

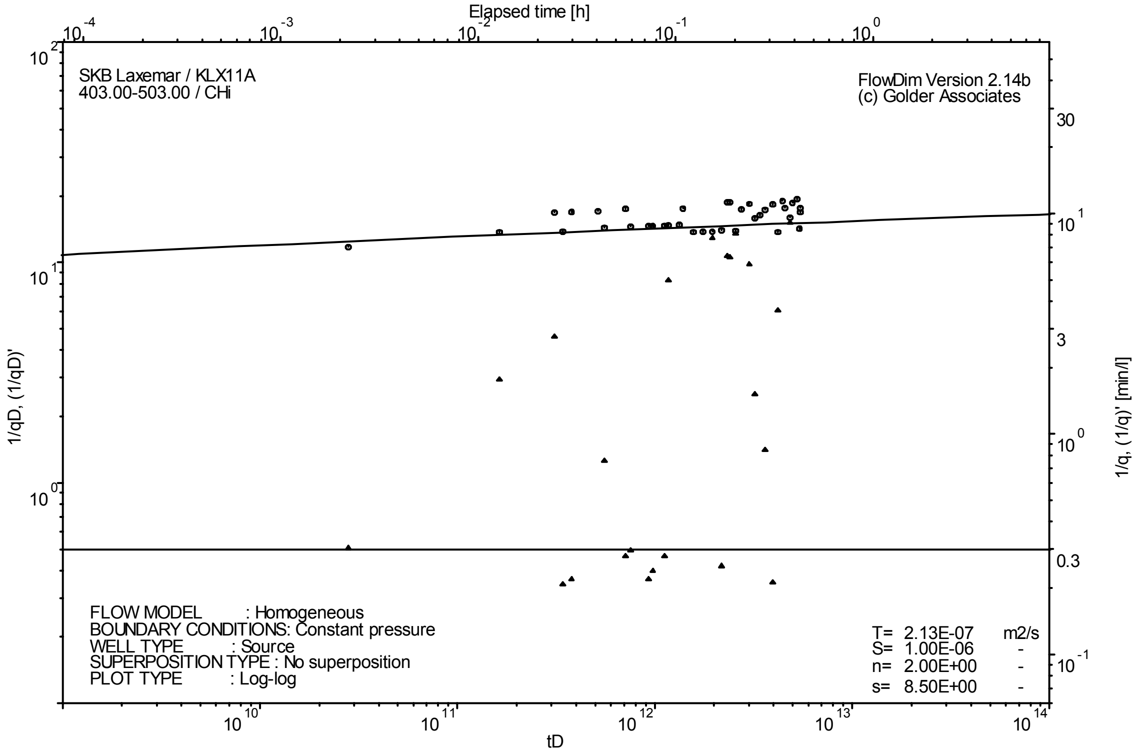
Analysis diagrams



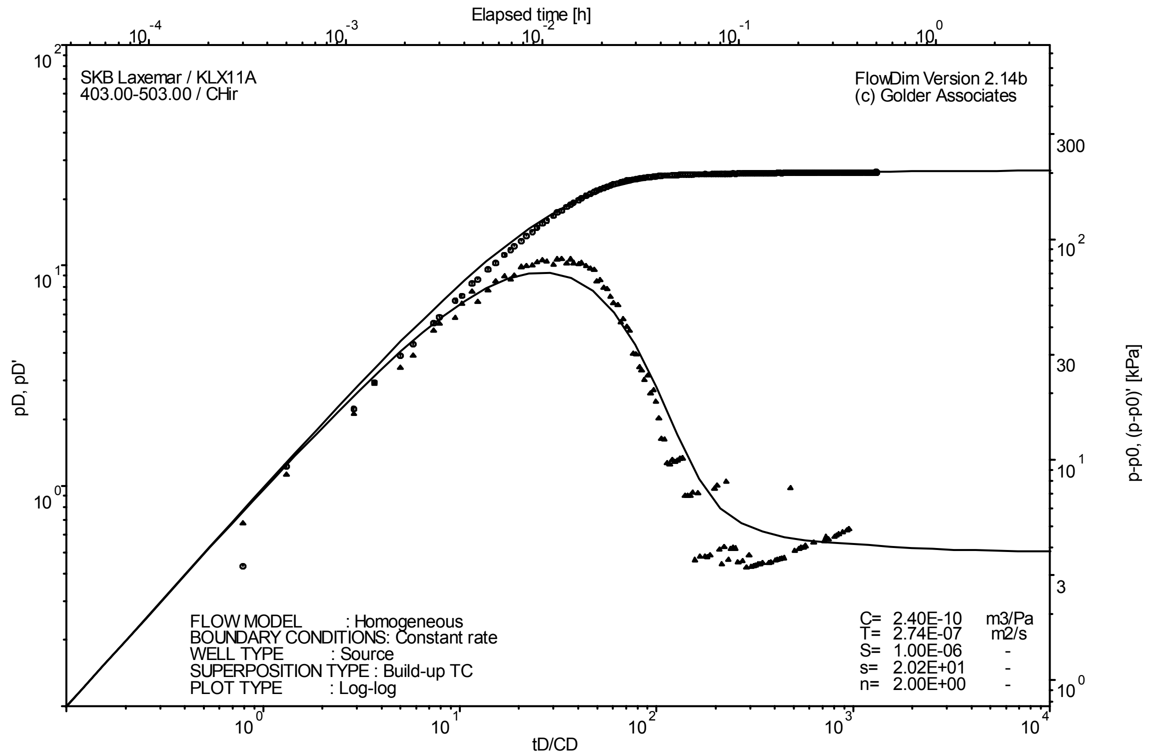
Pressure and flow rate vs. time; cartesian plot



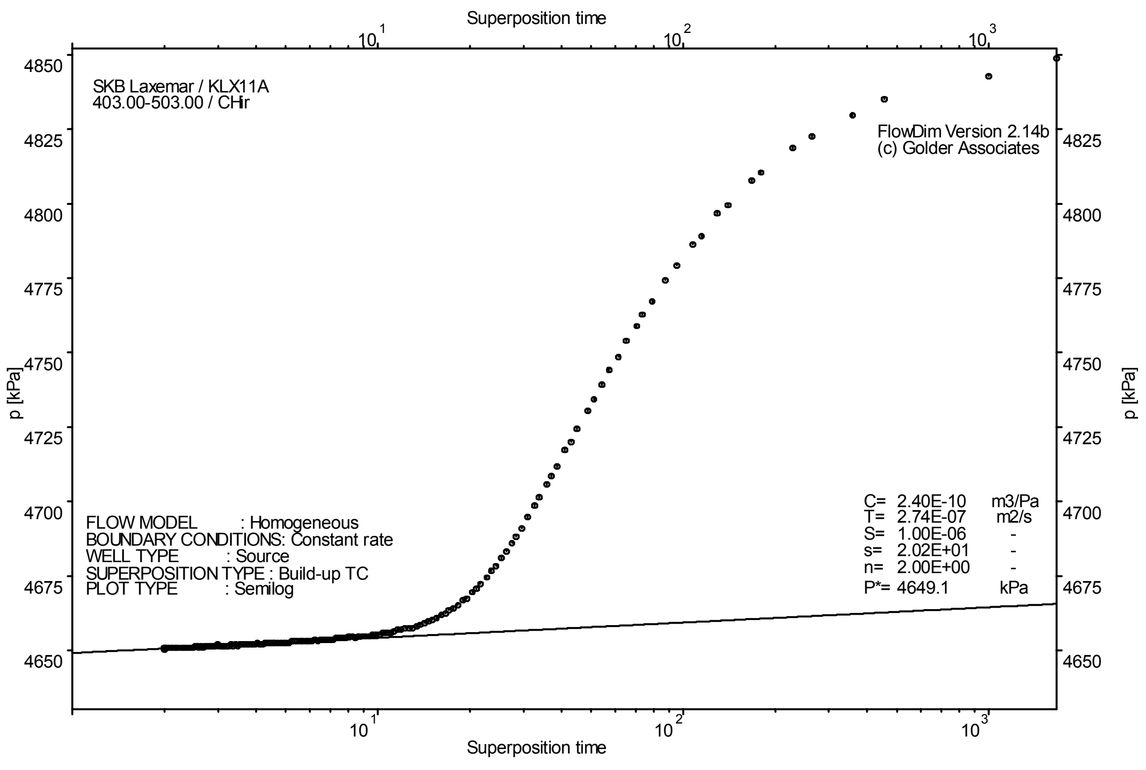
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

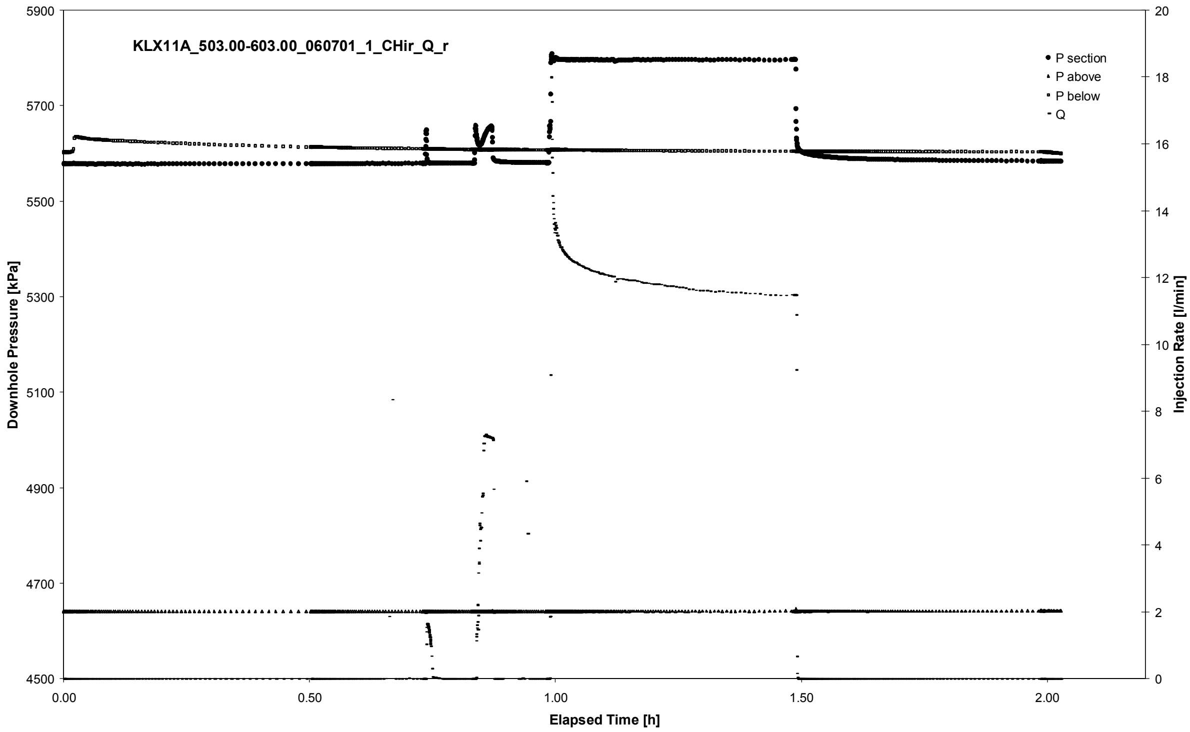


CHIR phase; HORNER match

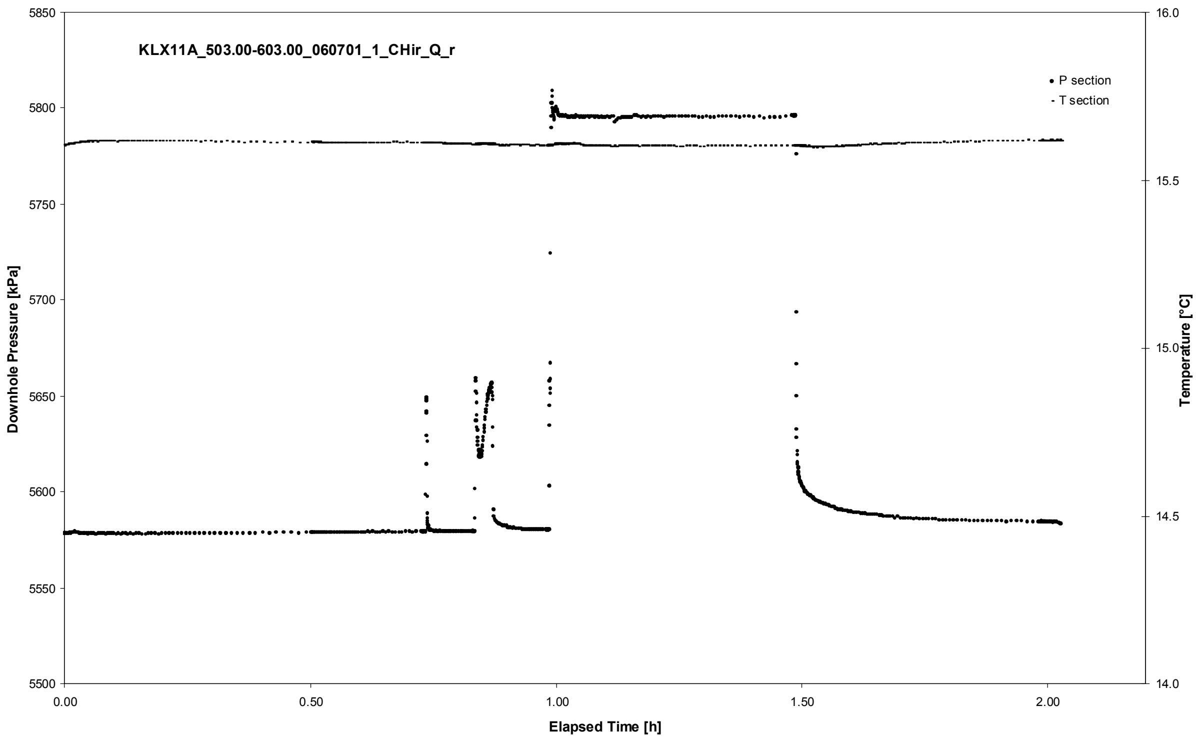
APPENDIX 2-5

Test 503.00 – 603.00 m

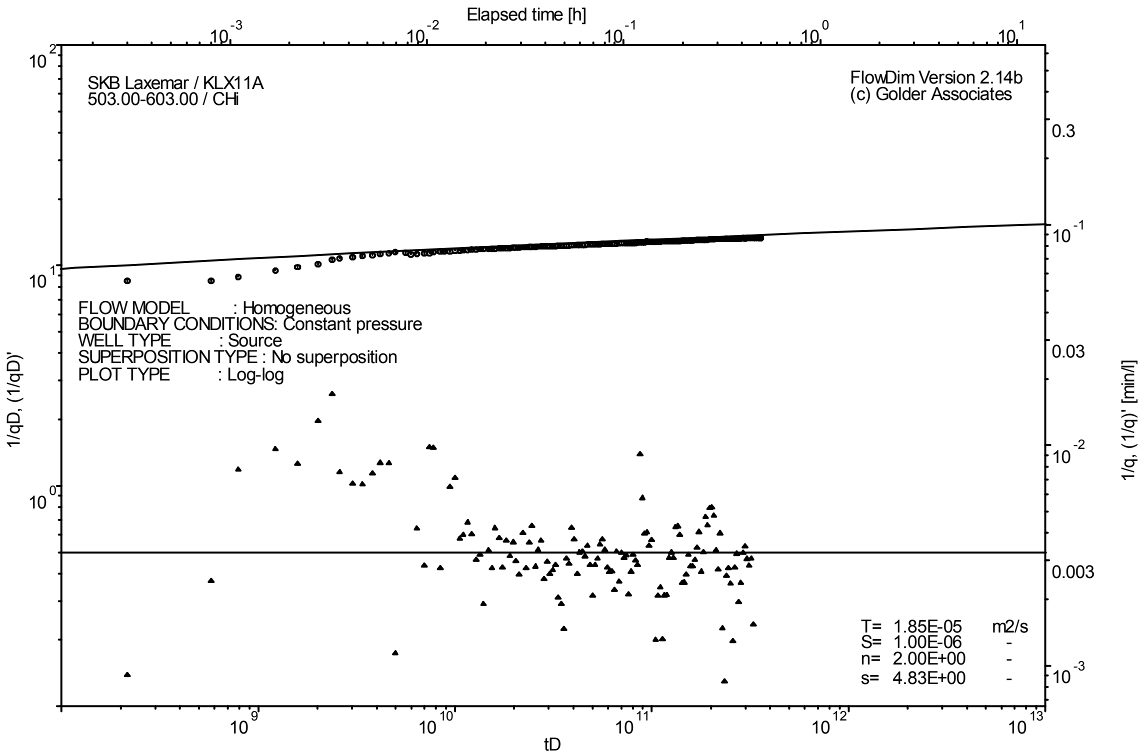
Analysis diagrams



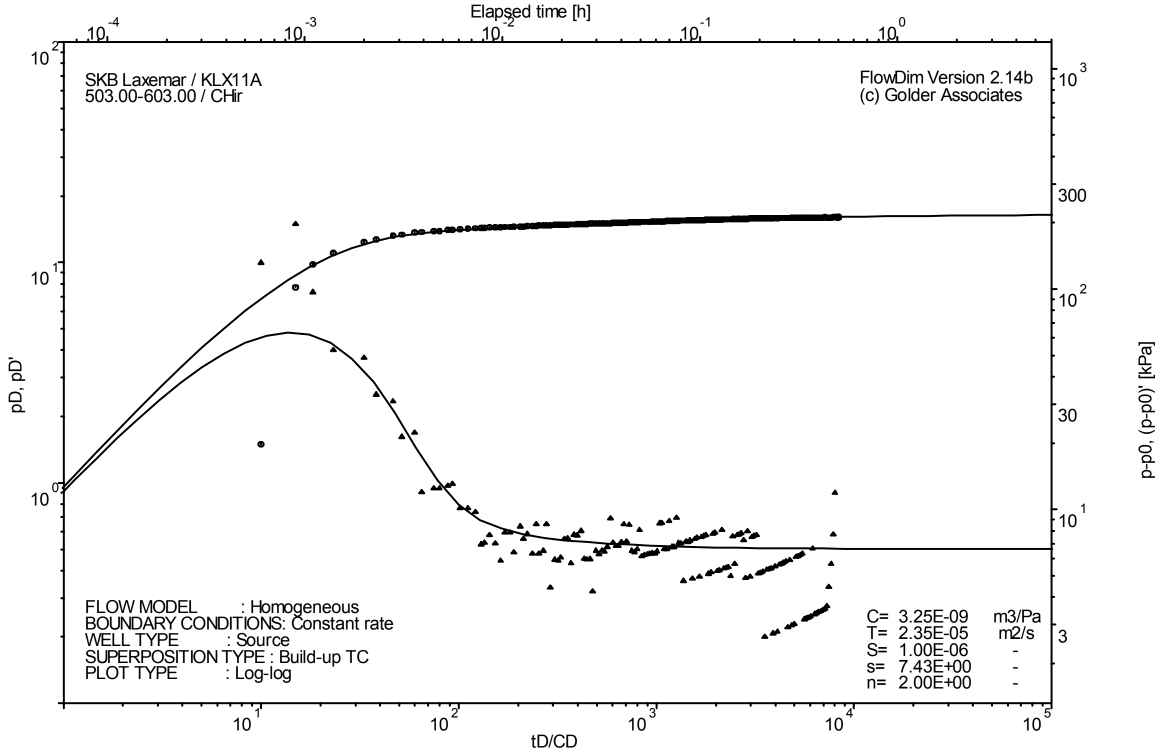
Pressure and flow rate vs. time; cartesian plot



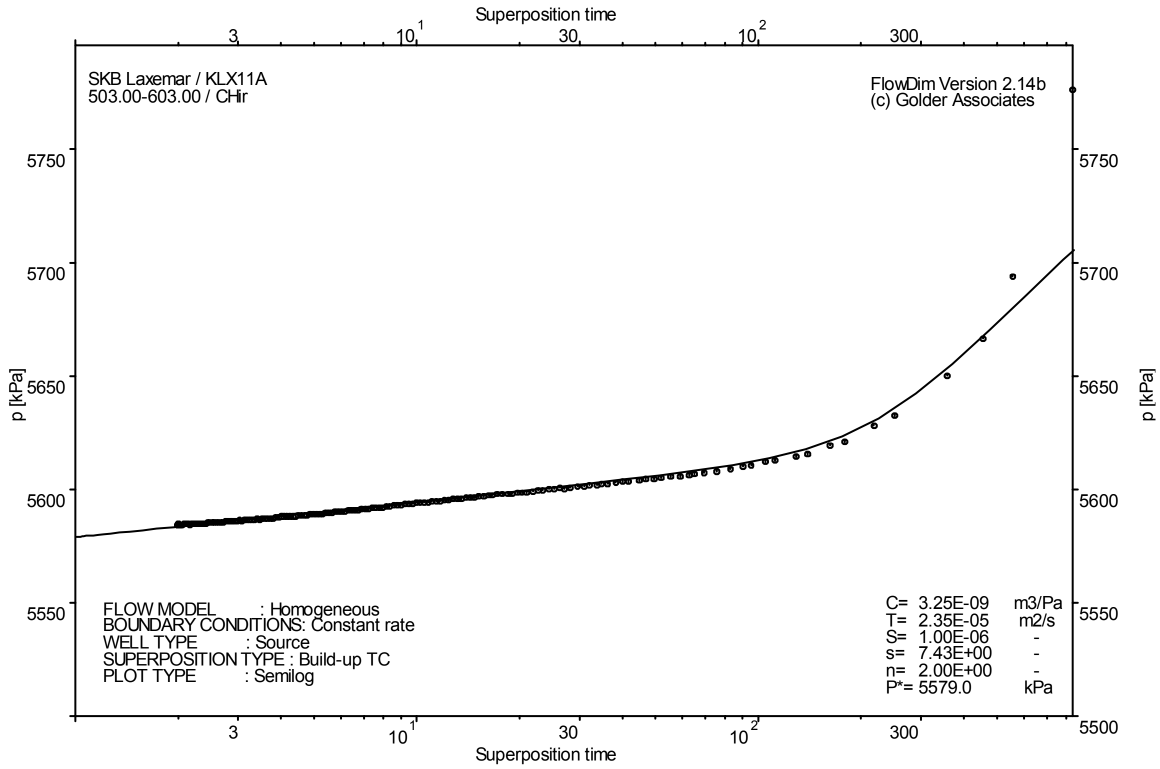
Interval pressure and temperature vs. time; cartesian plot



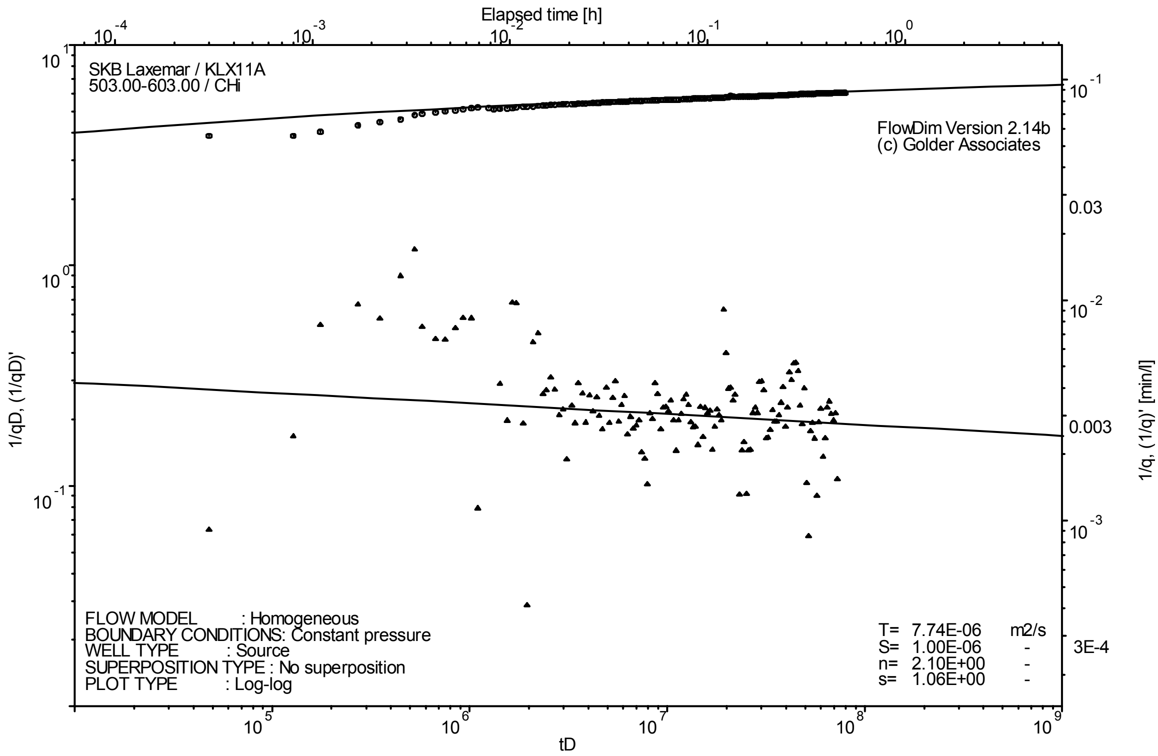
CHI phase; log-log match



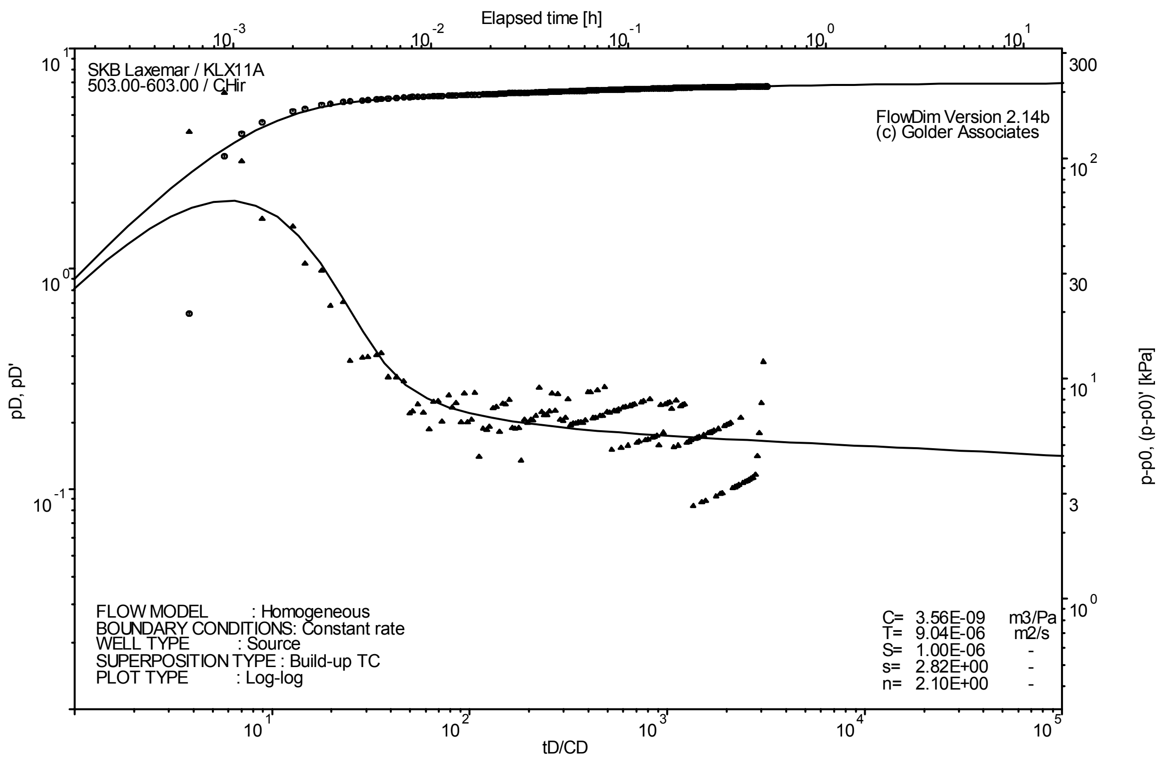
CHIR phase; log-log match



CHIR phase; HORNER match



CHI phase; log-log match (n=2.1)

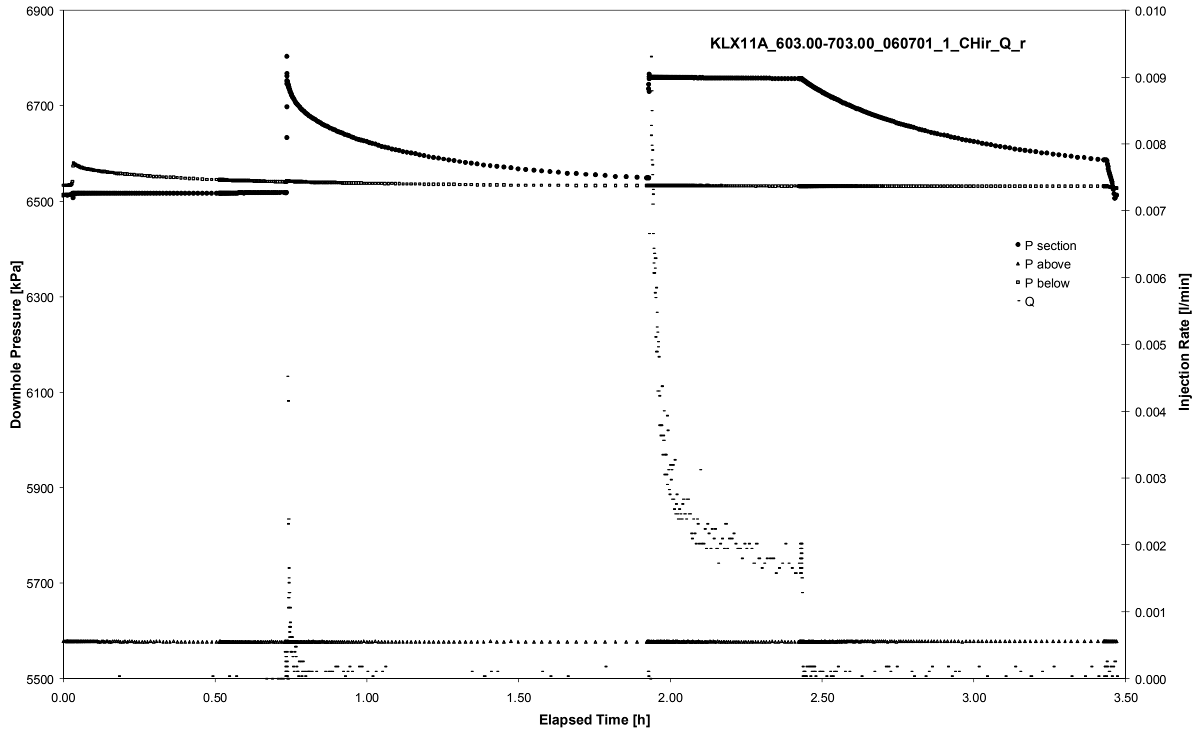


CHIR phase; log-log match (n=2.1)

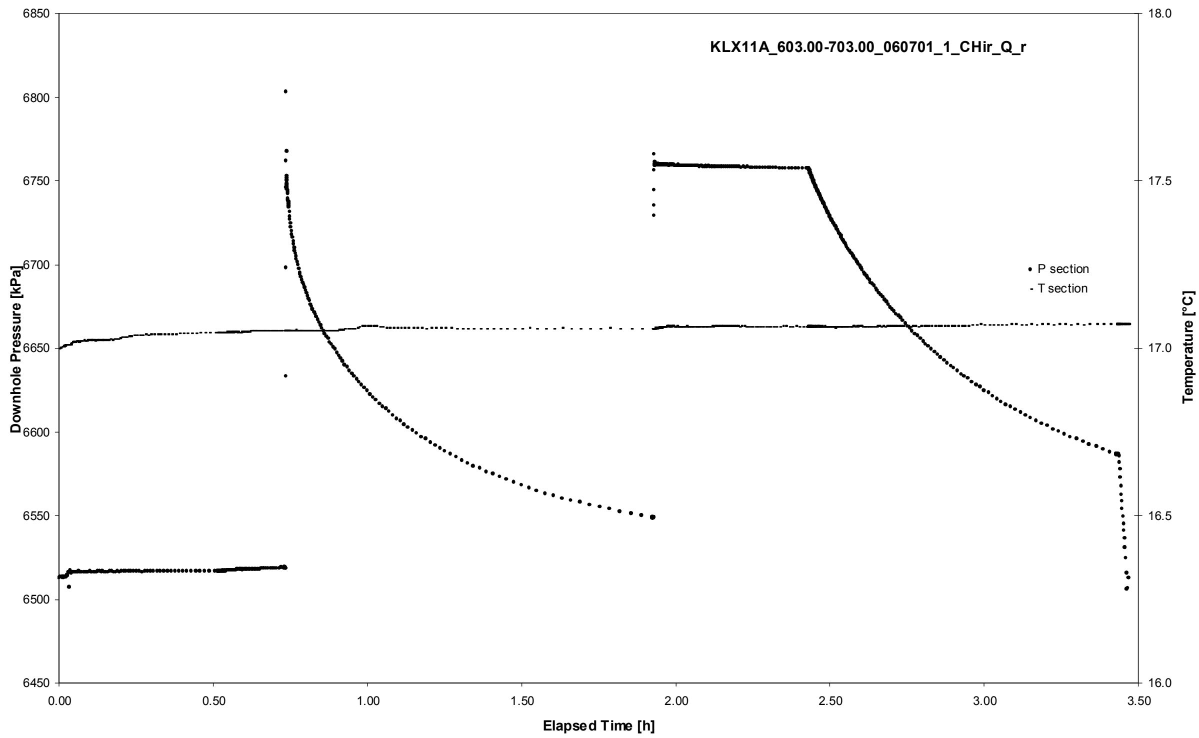
APPENDIX 2-6

Test 603.00 – 703.00 m

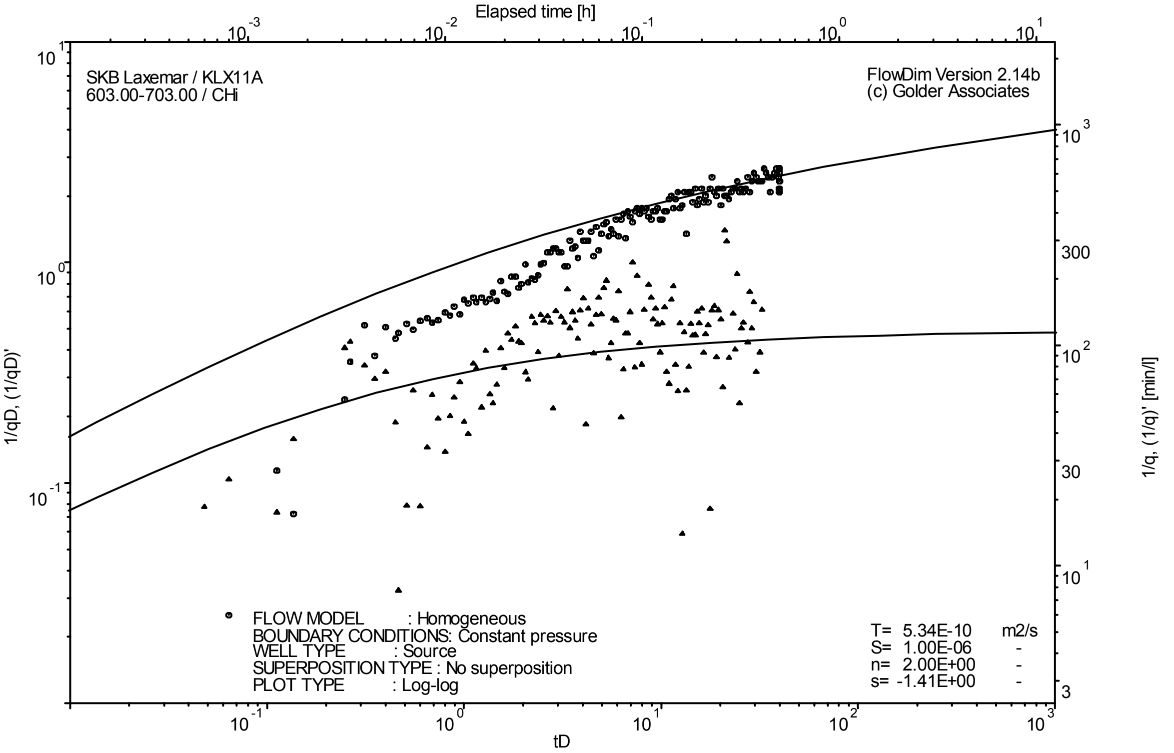
Analysis diagrams



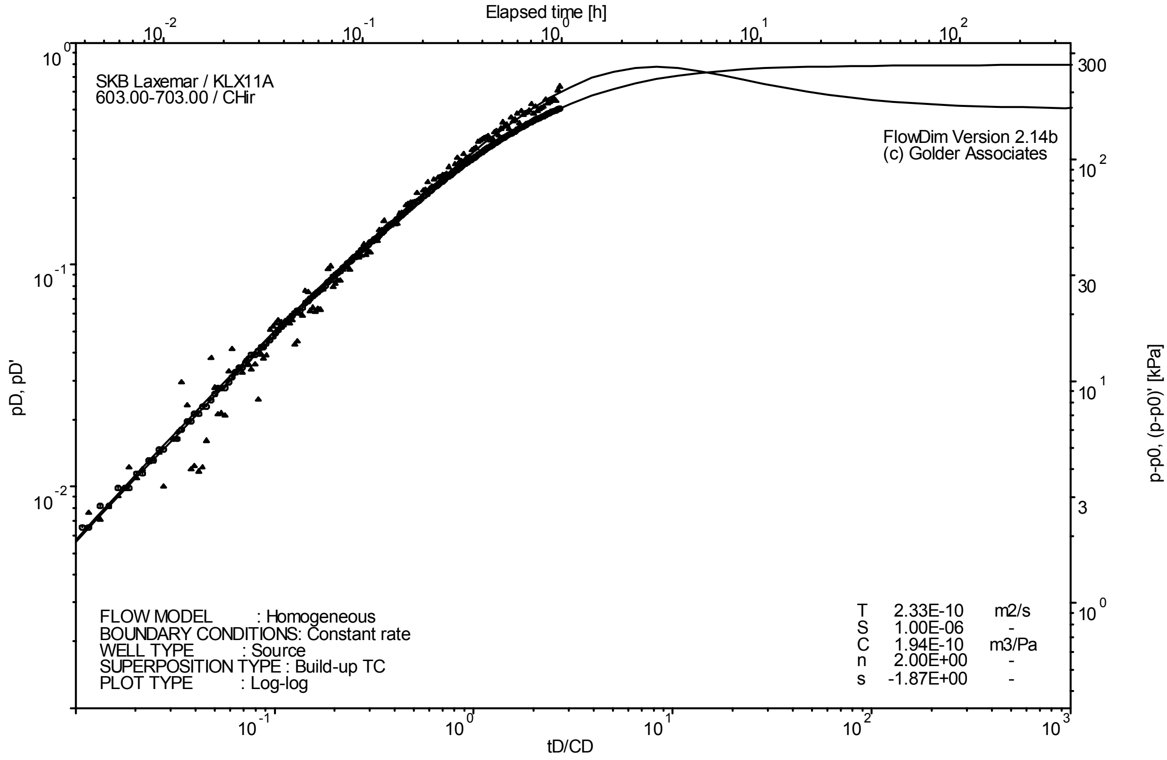
Pressure and flow rate vs. time; cartesian plot



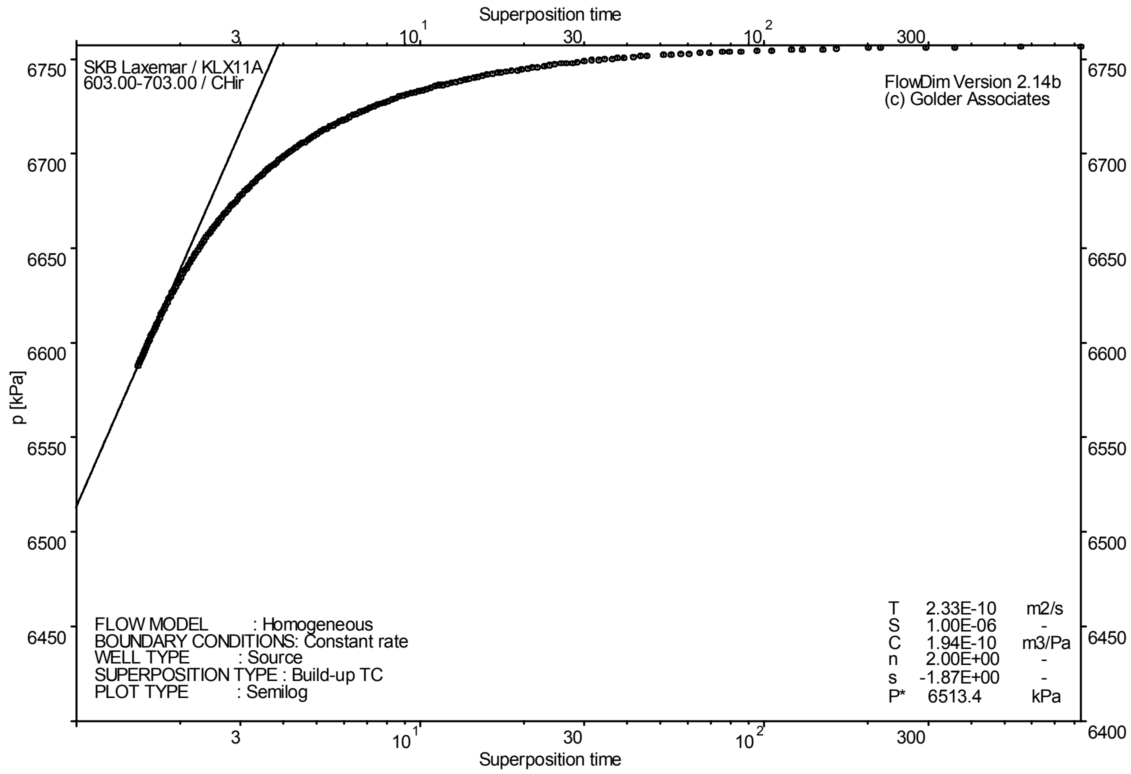
Interval pressure and temperature vs. time; cartesian plot



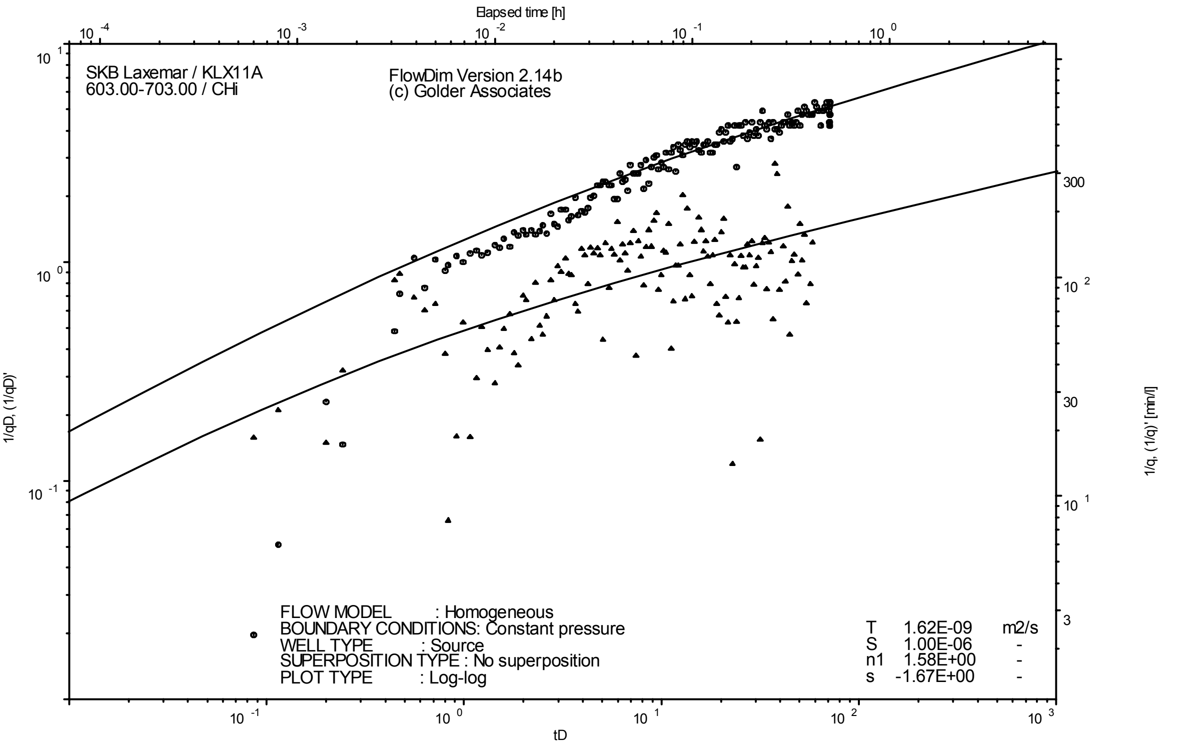
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

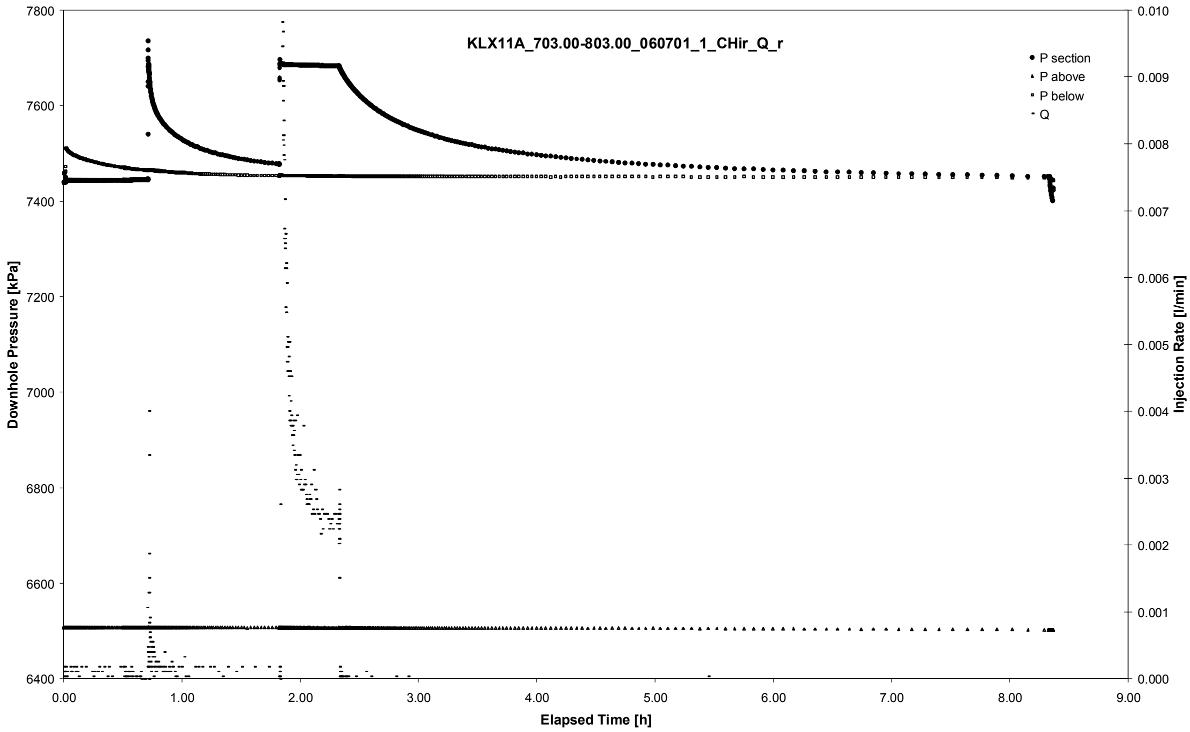


CHI phase; log-log match (n=1.58)

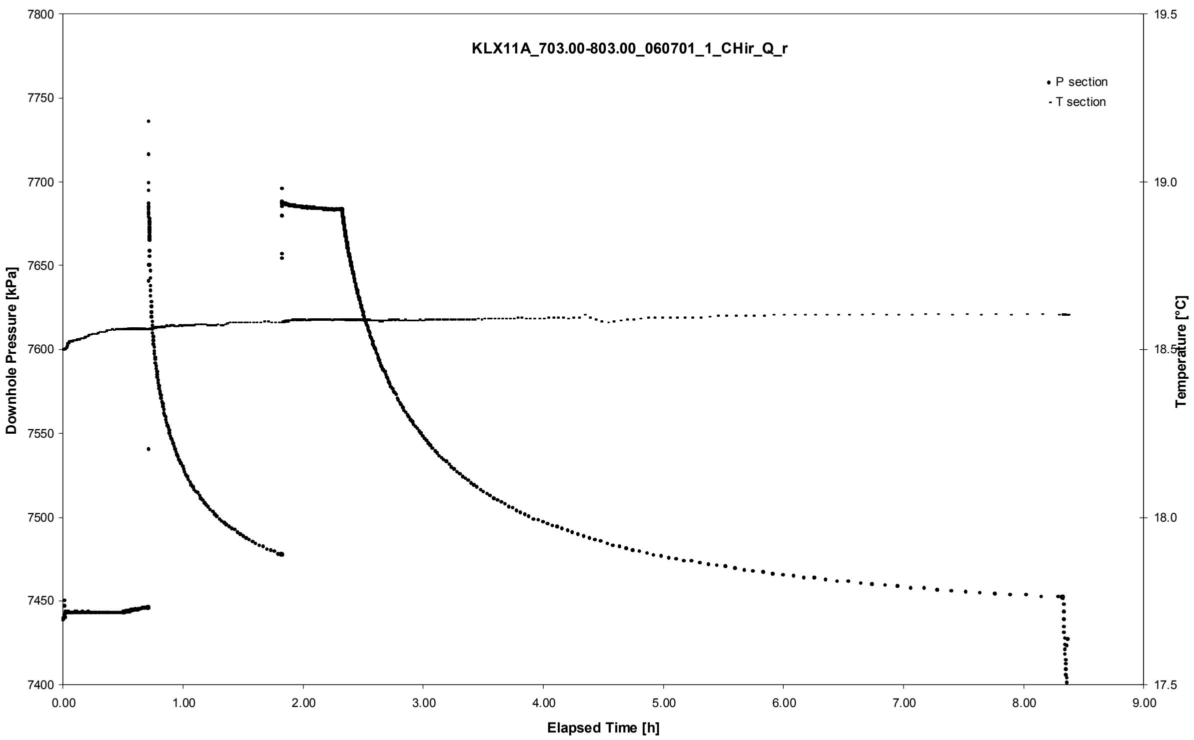
APPENDIX 2-7

Test 703.00 – 803.00 m

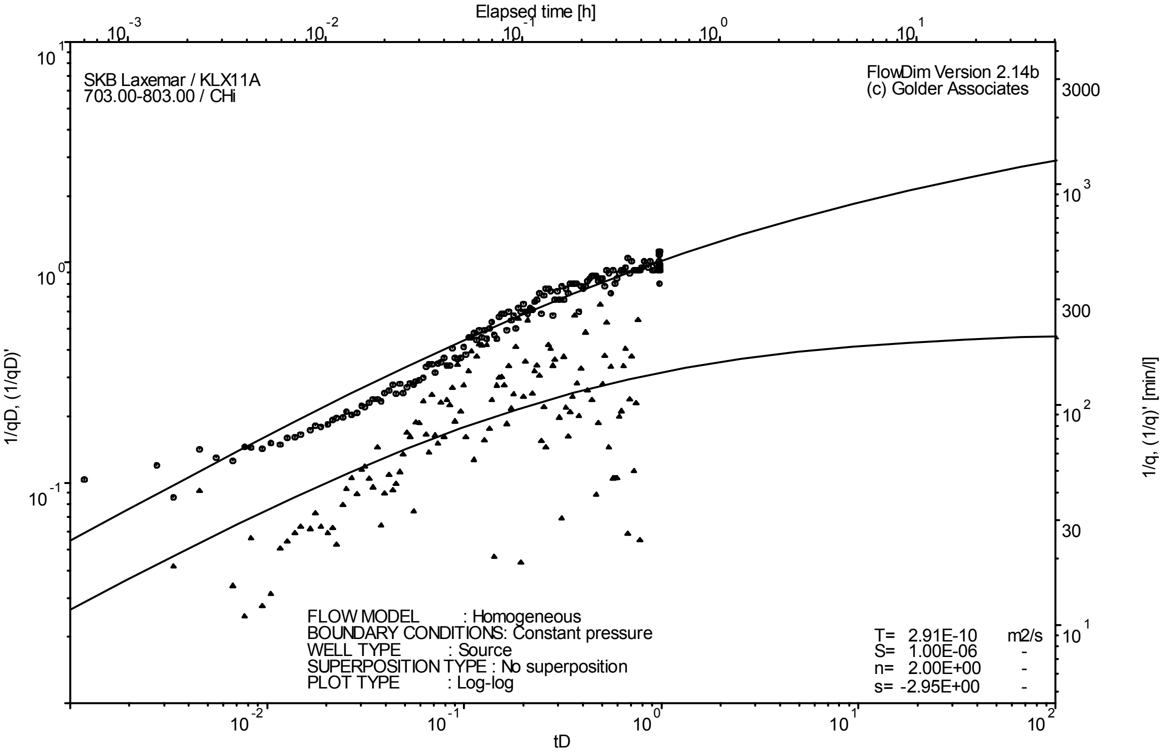
Analysis diagrams



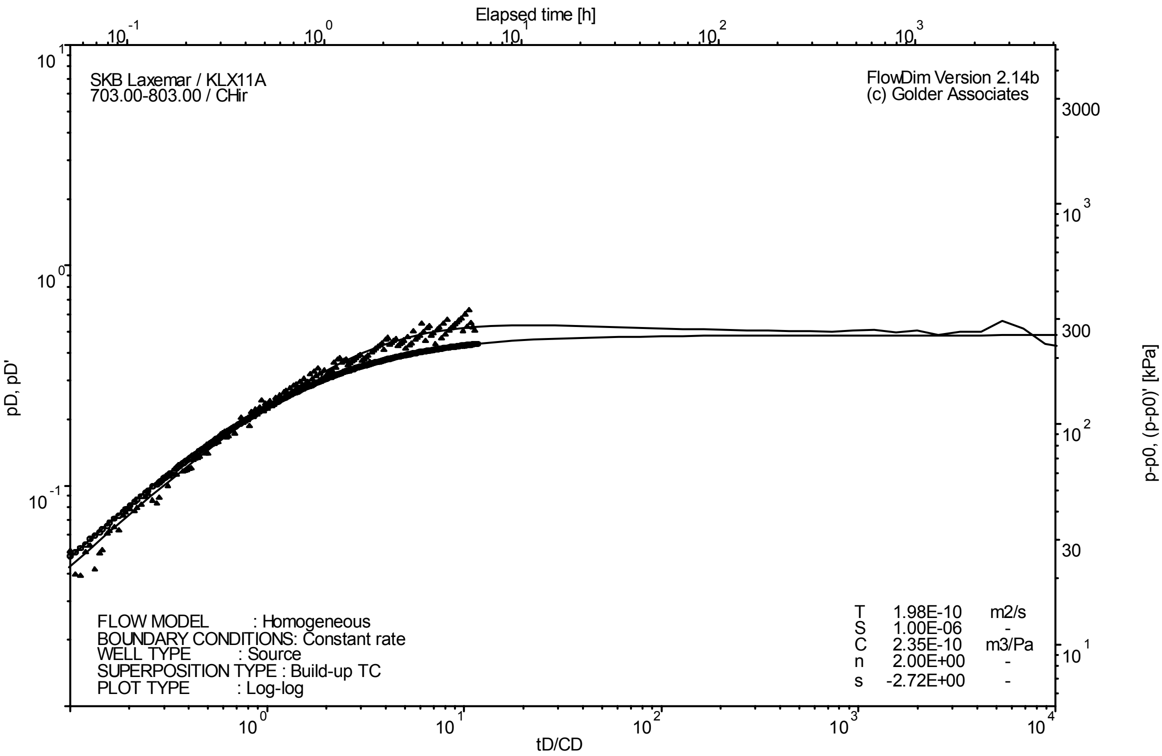
Pressure and flow rate vs. time; cartesian plot



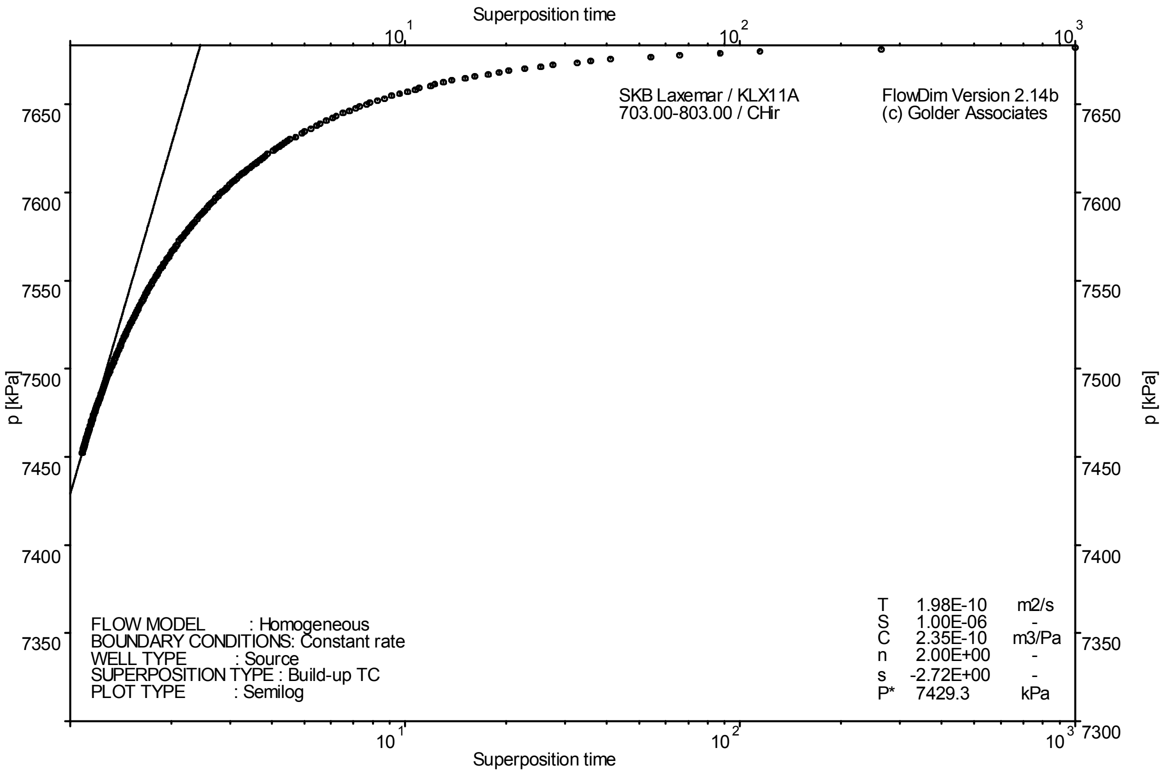
Interval pressure and temperature vs. time; cartesian plot



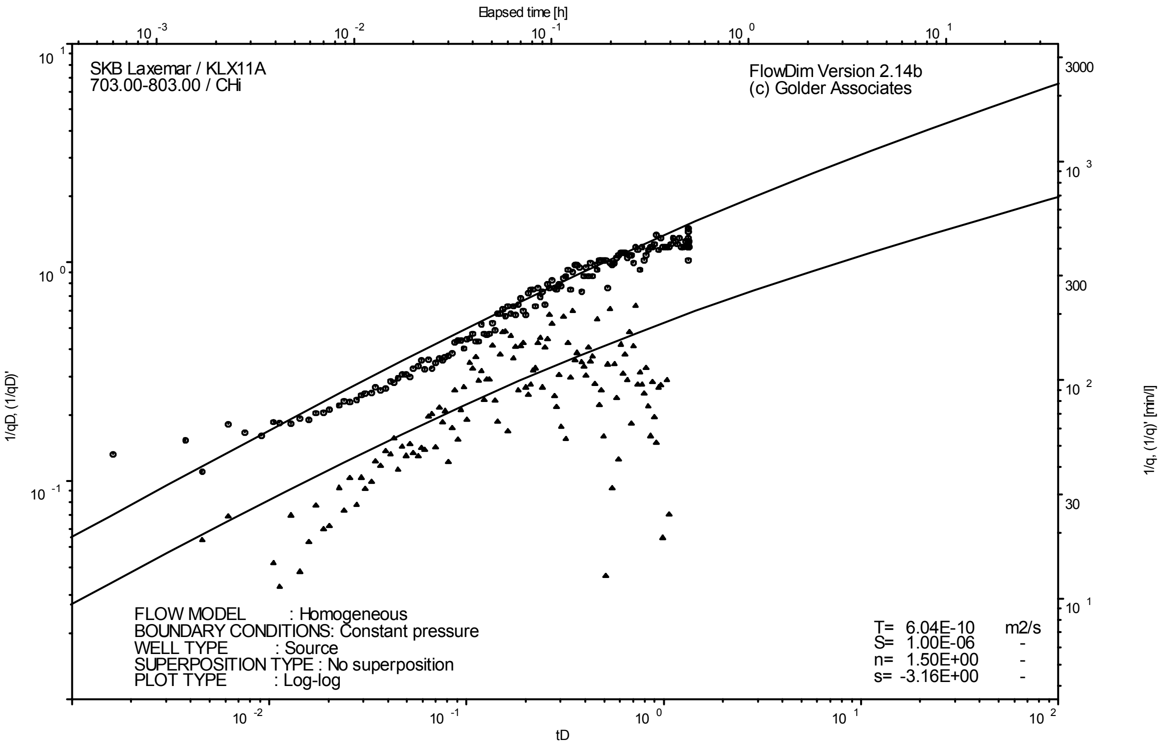
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

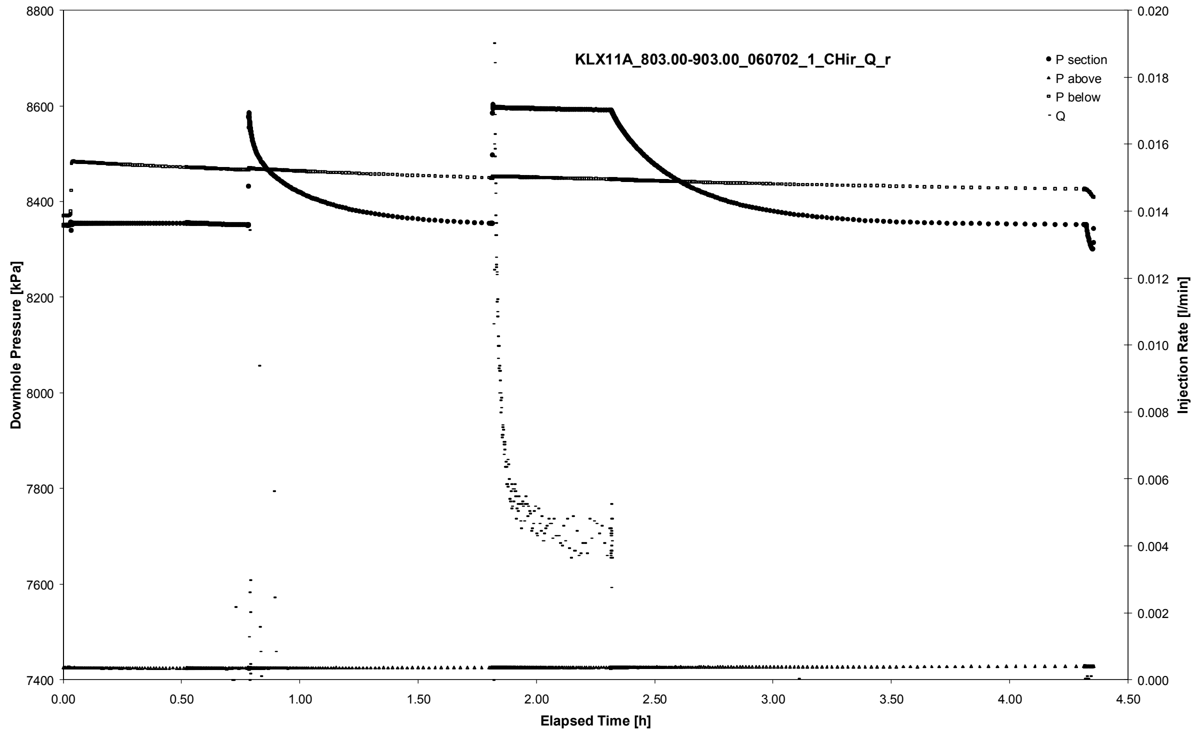


CHI phase; log-log match (n=1.5)

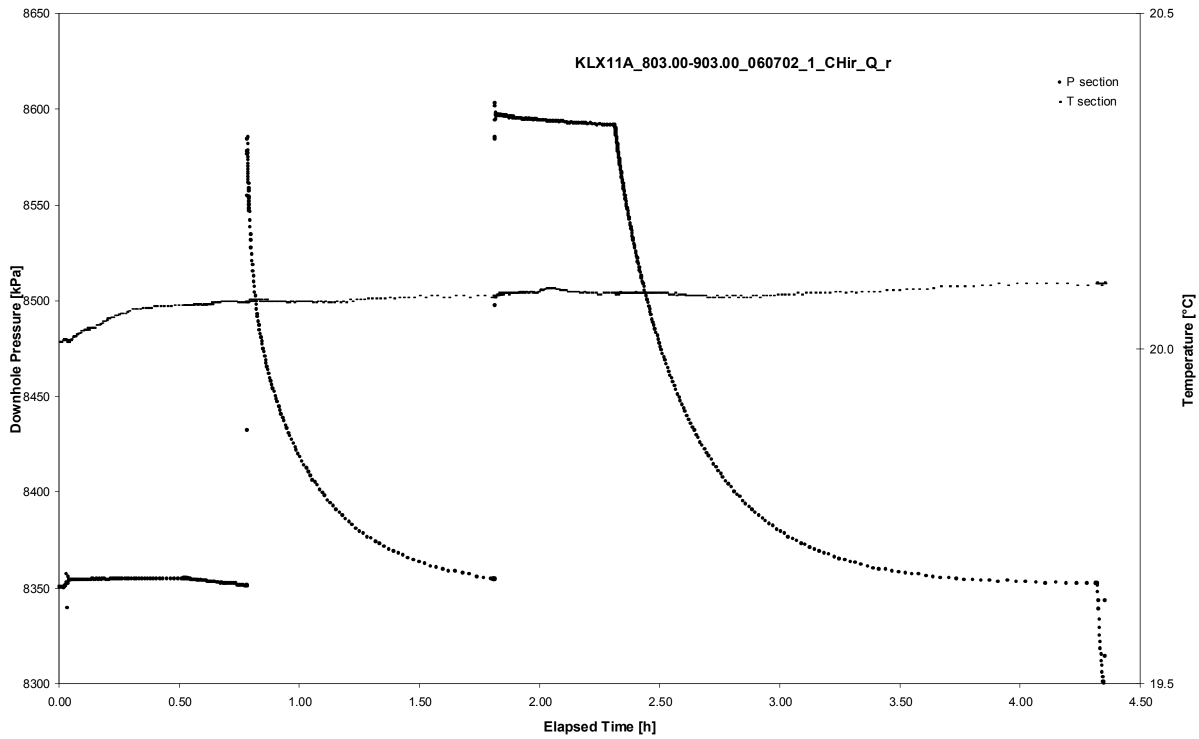
APPENDIX 2-8

Test 803.00 – 903.00 m

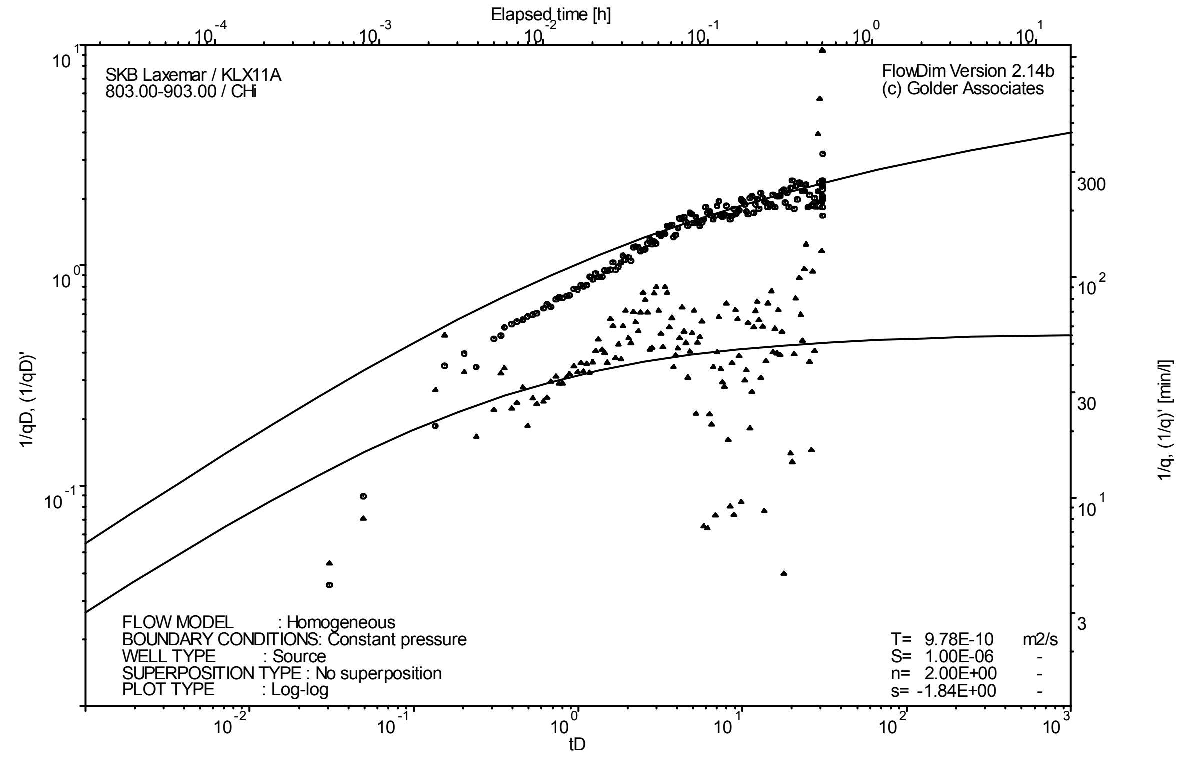
Analysis diagrams



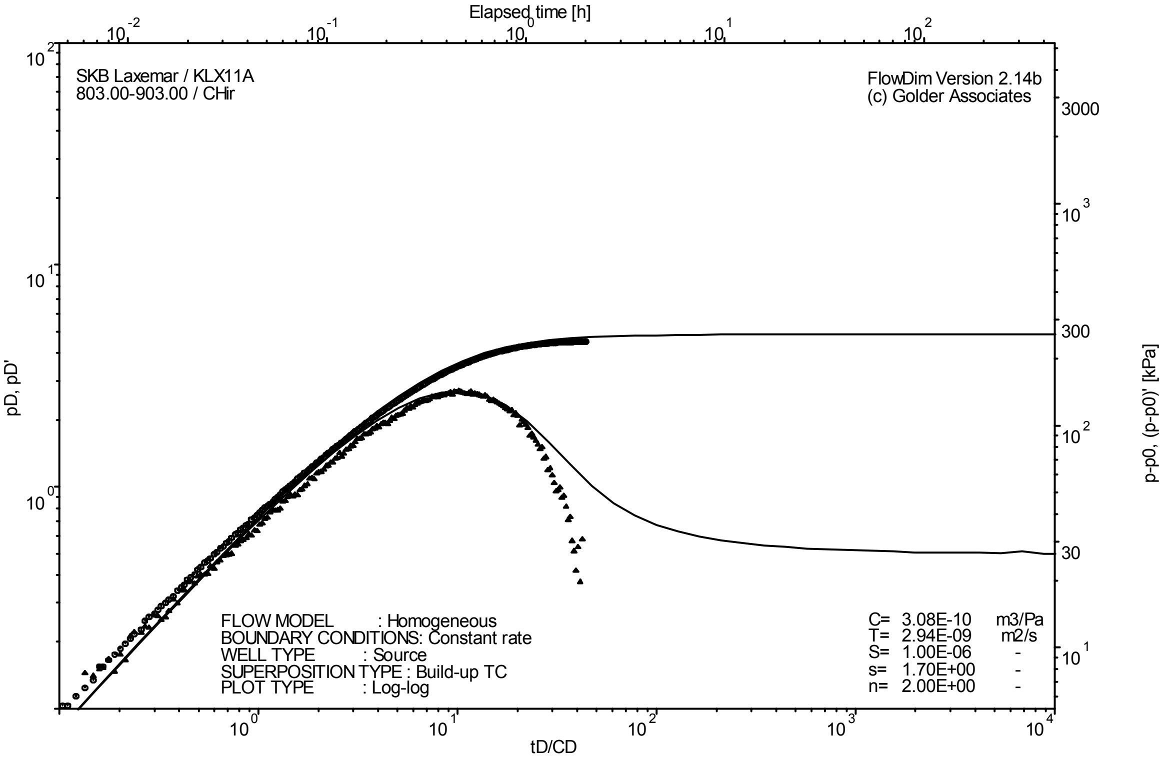
Pressure and flow rate vs. time; cartesian plot



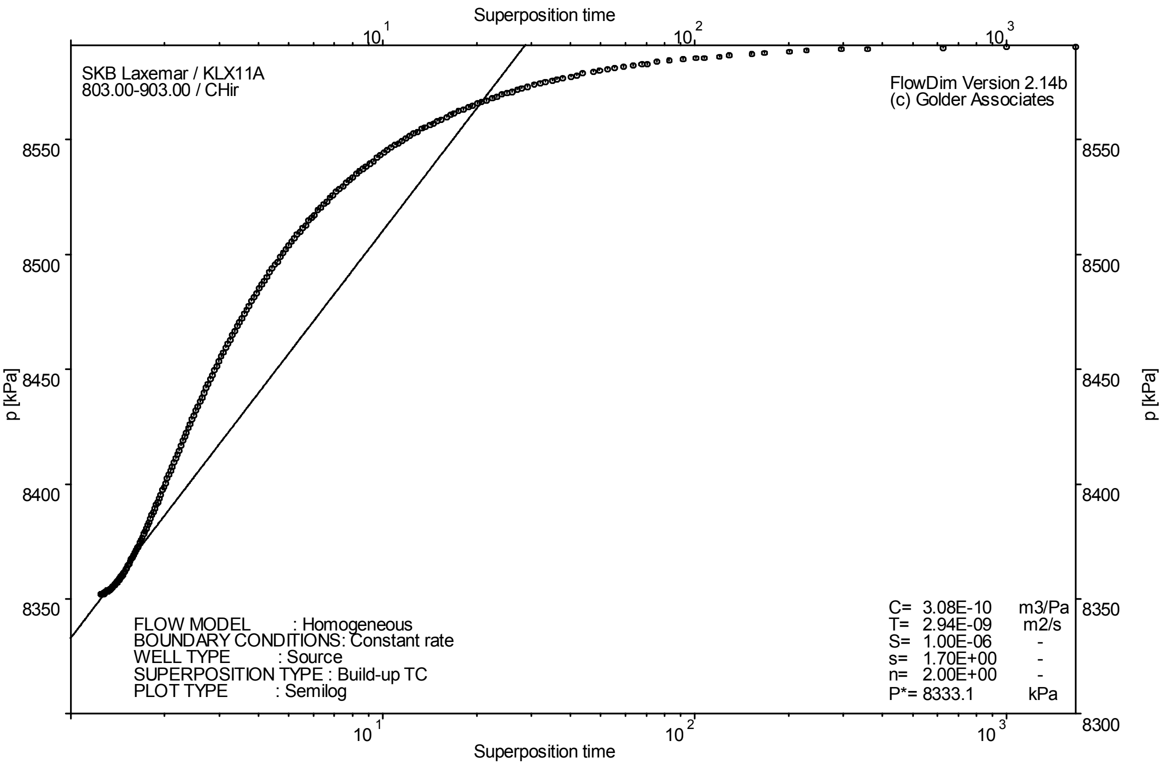
Interval pressure and temperature vs. time; cartesian plot



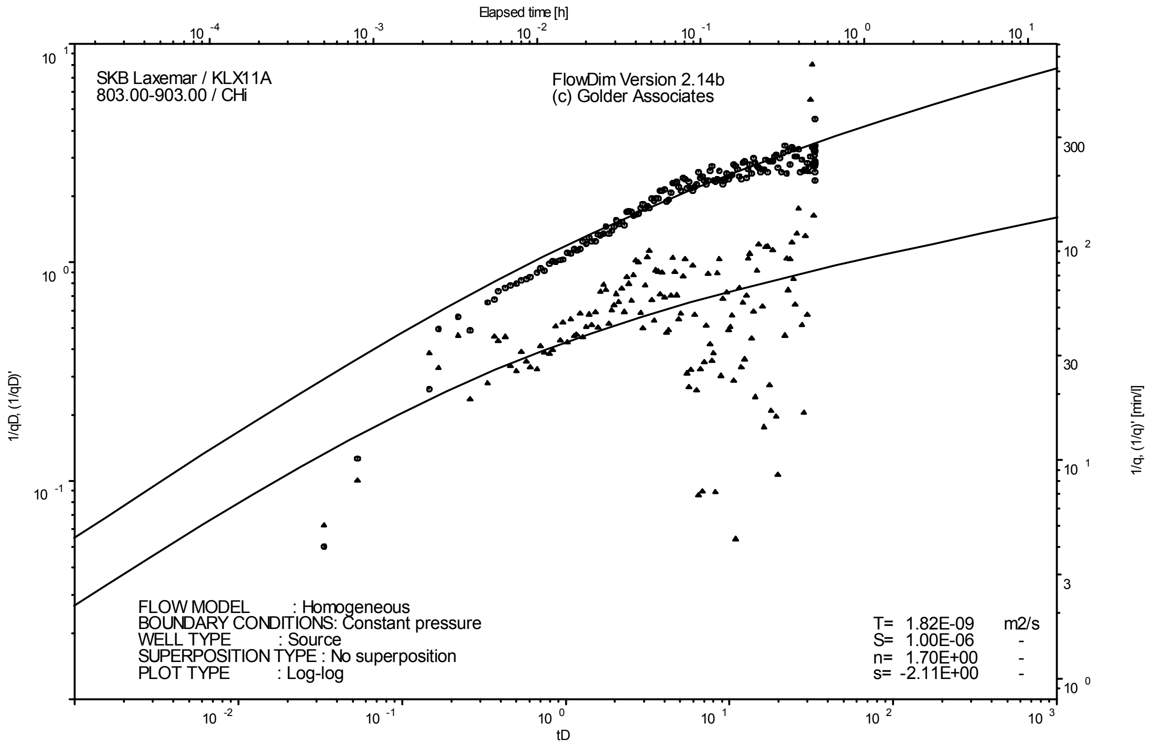
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

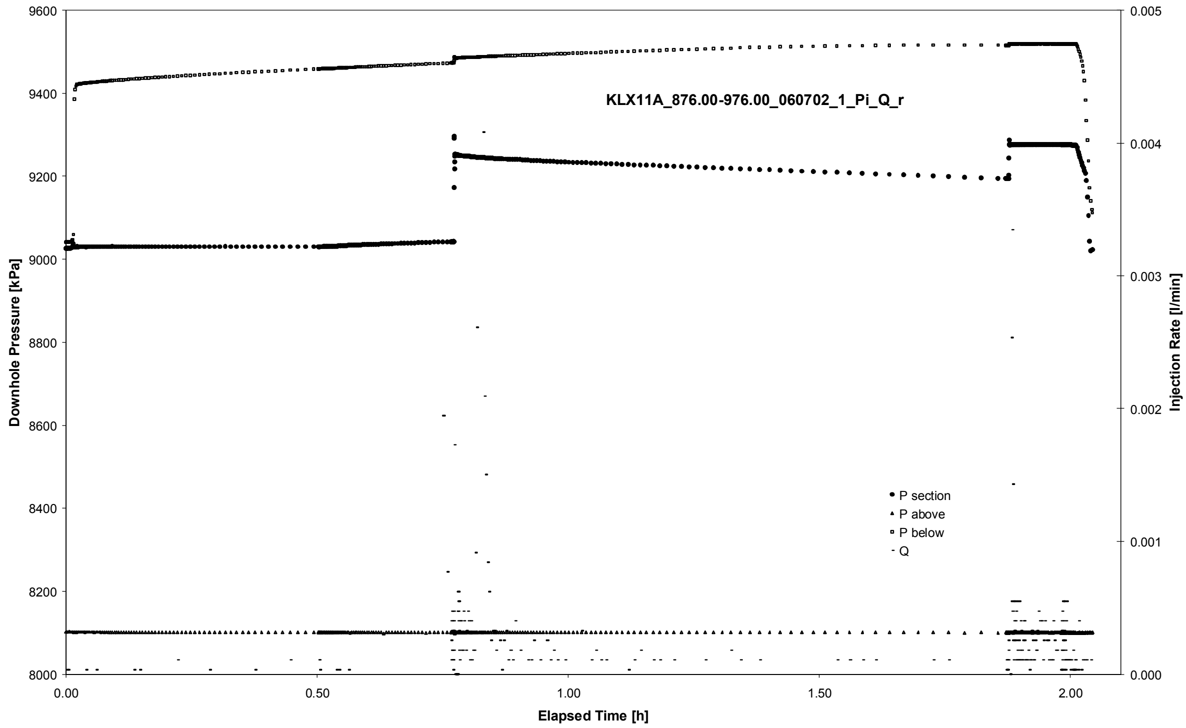


CHI phase; log-log match (n=1.7)

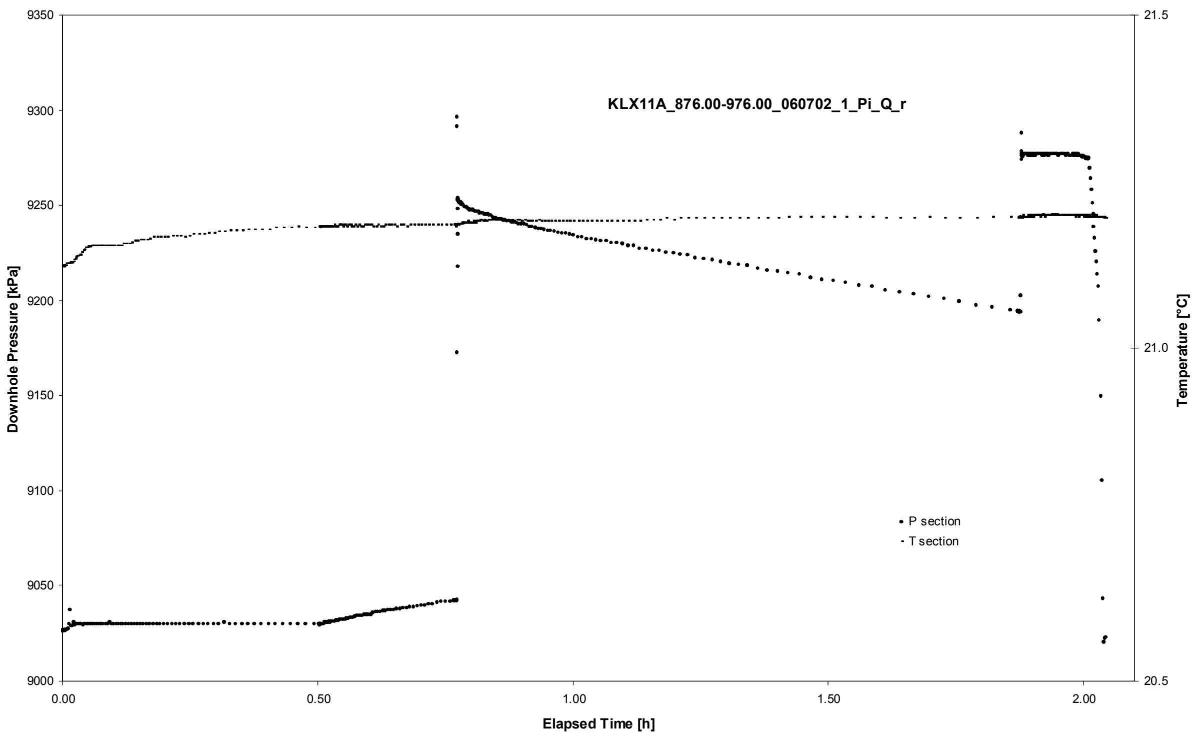
APPENDIX 2-9

Test 876.00 – 976.00 m

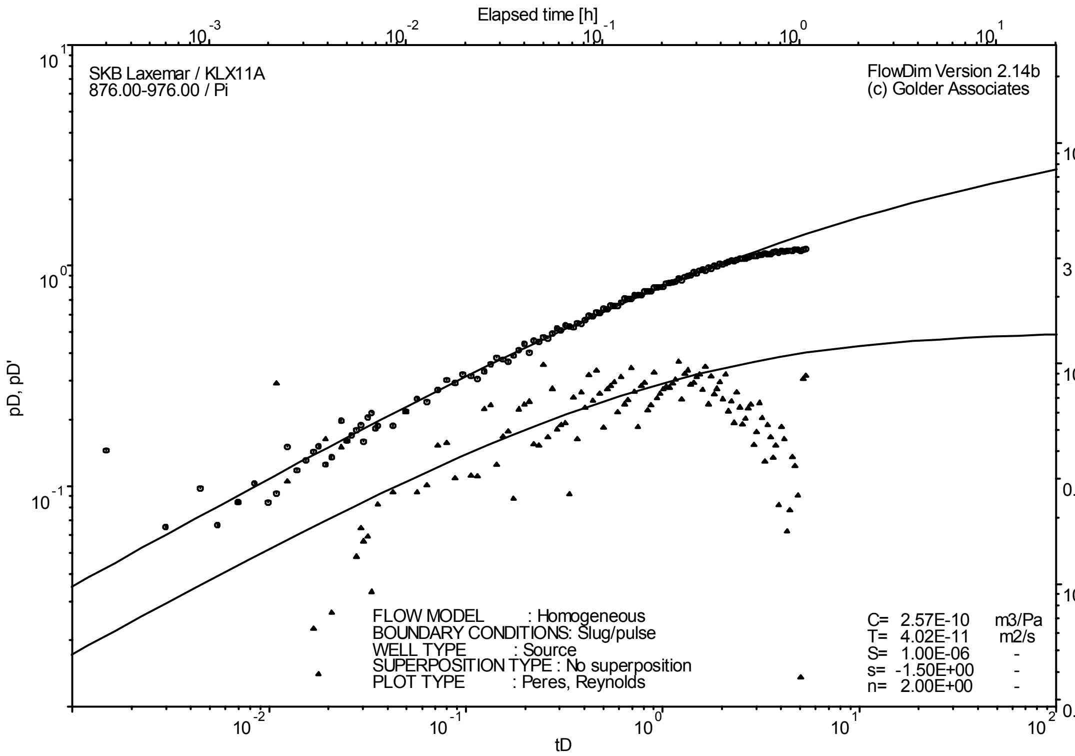
Analysis diagrams



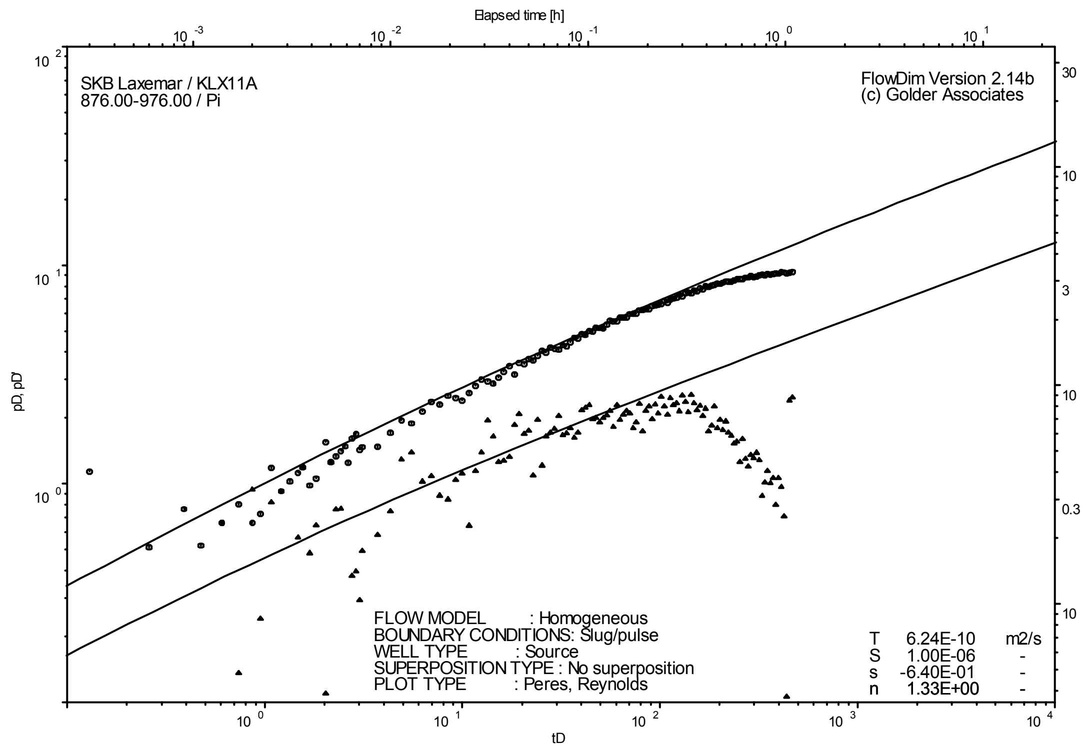
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



Pulse injection; deconvolution match

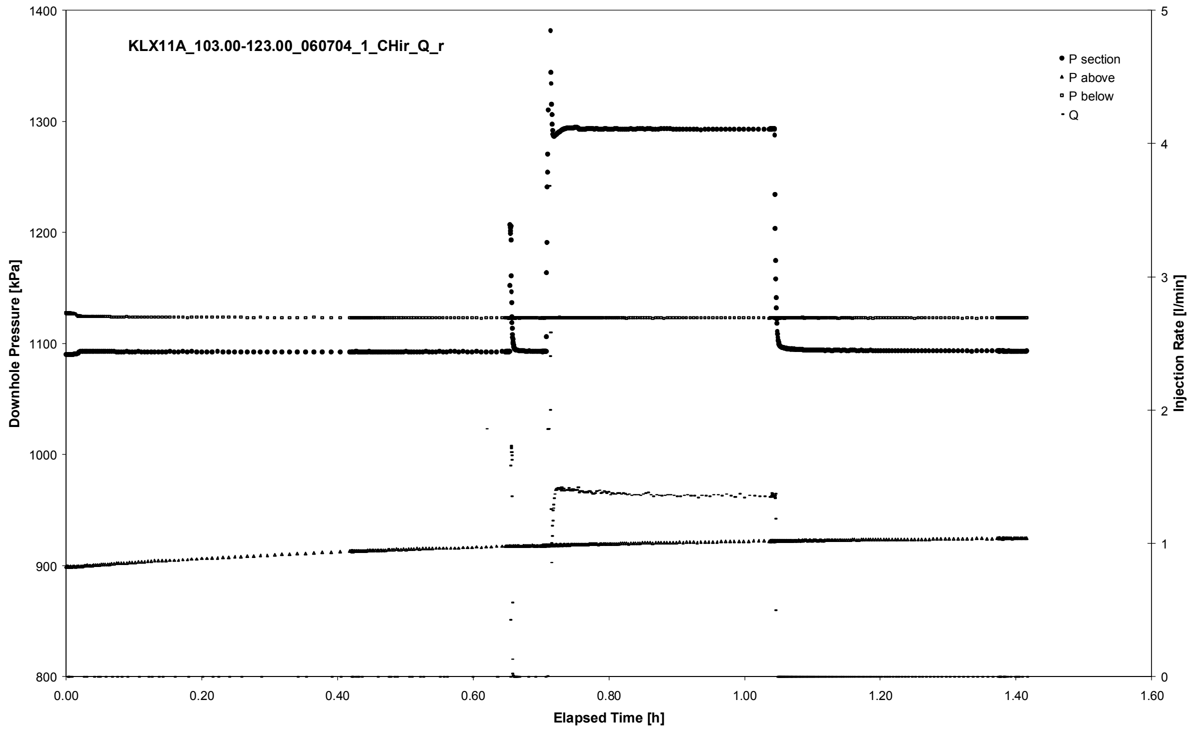


Pulse injection; deconvolution match (n=1.33)

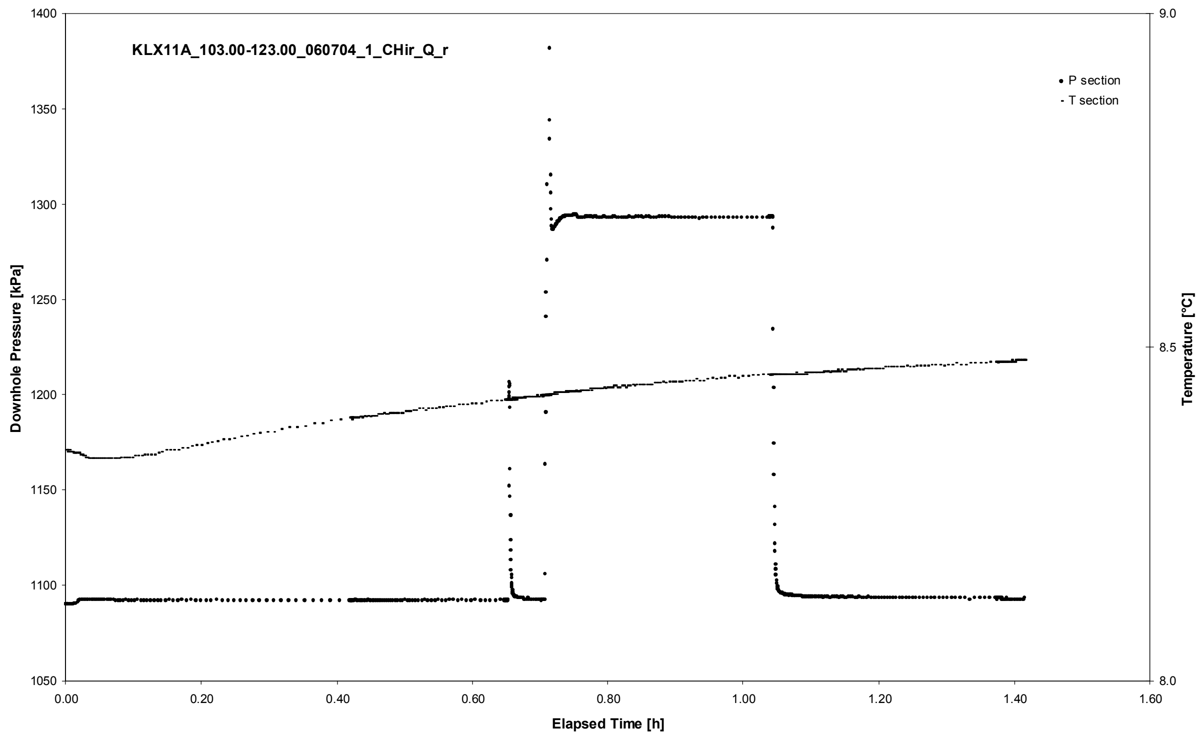
APPENDIX 2-10

Test 103.00 – 123.00 m

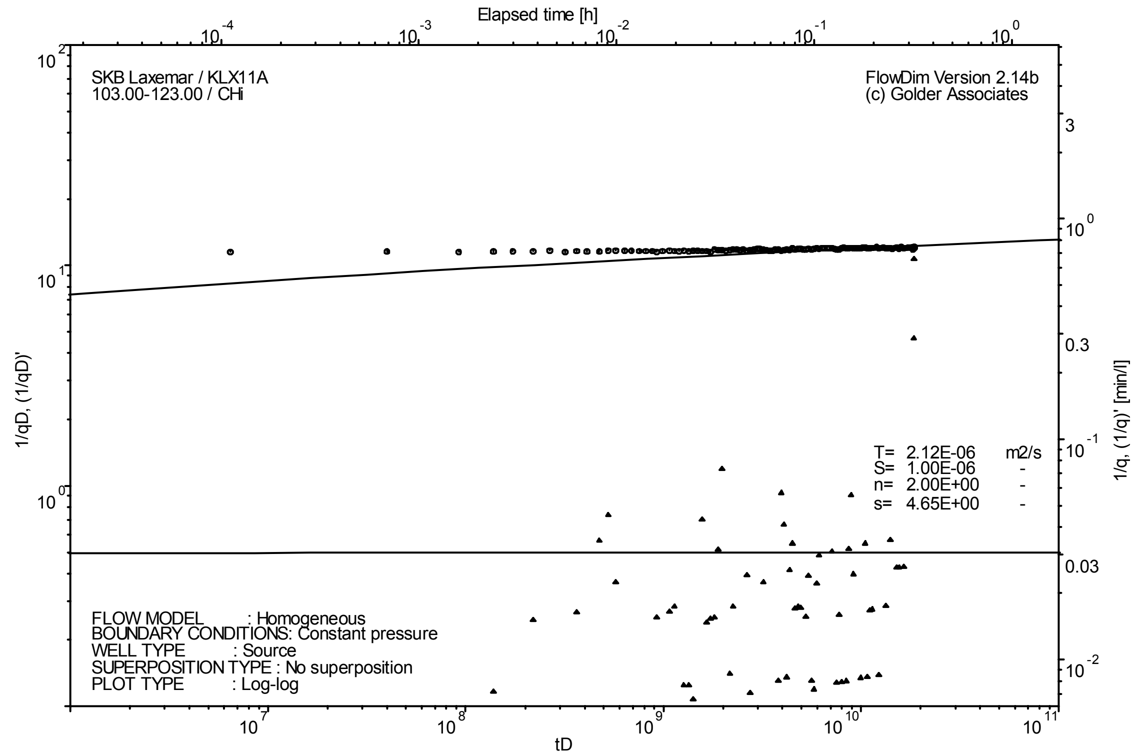
Analysis diagrams



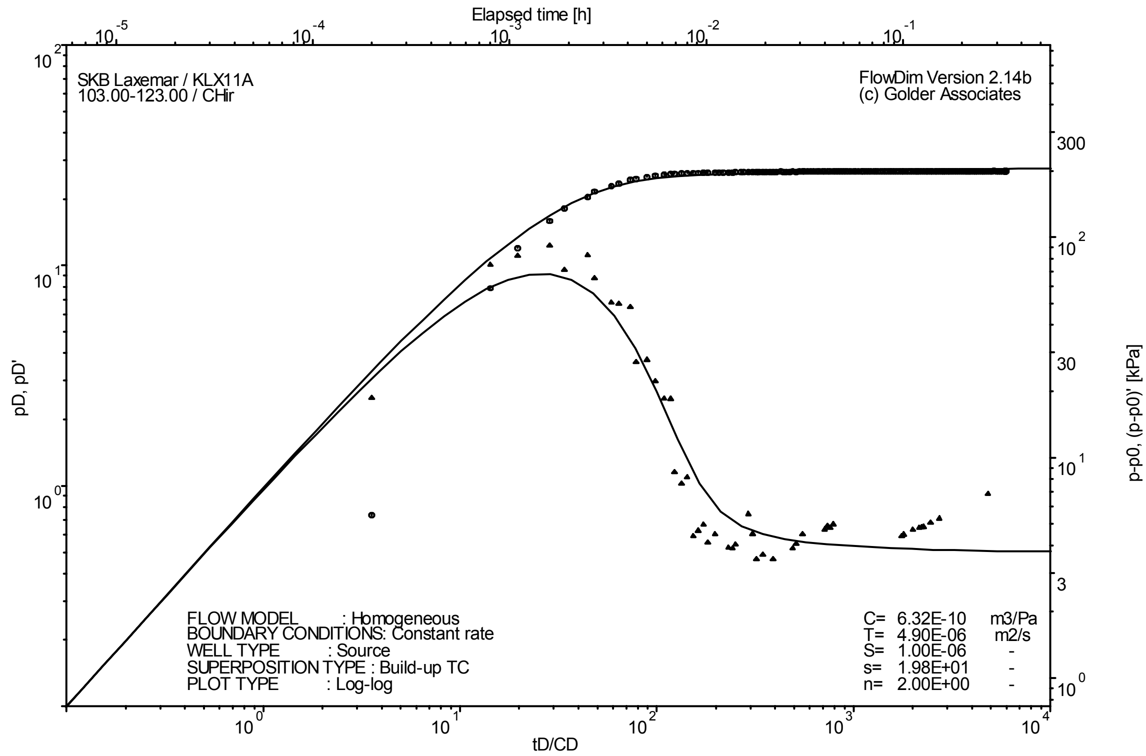
Pressure and flow rate vs. time; cartesian plot



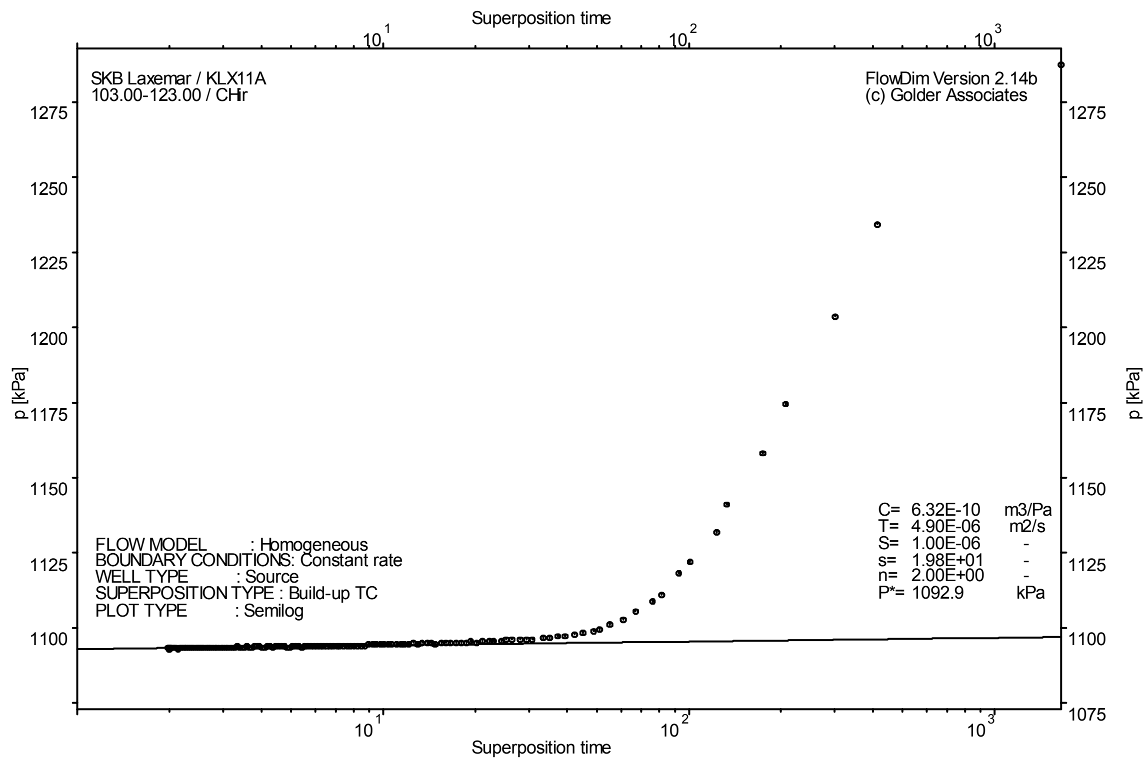
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

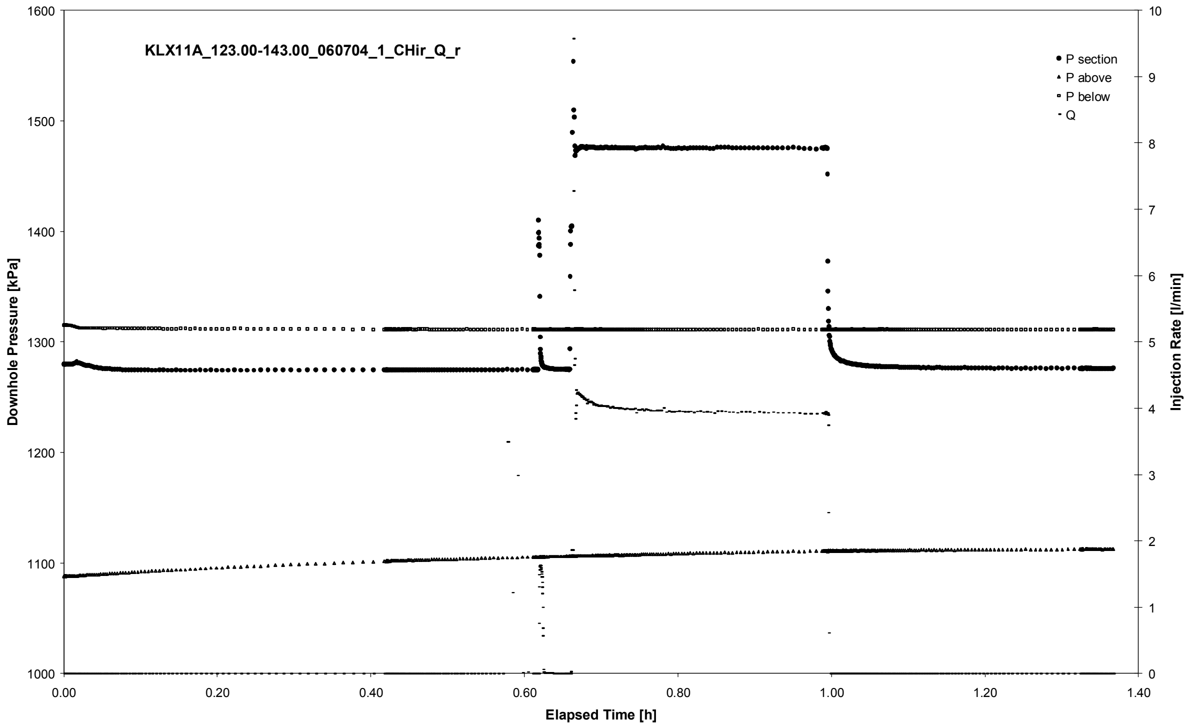


CHIR phase; HORNER match

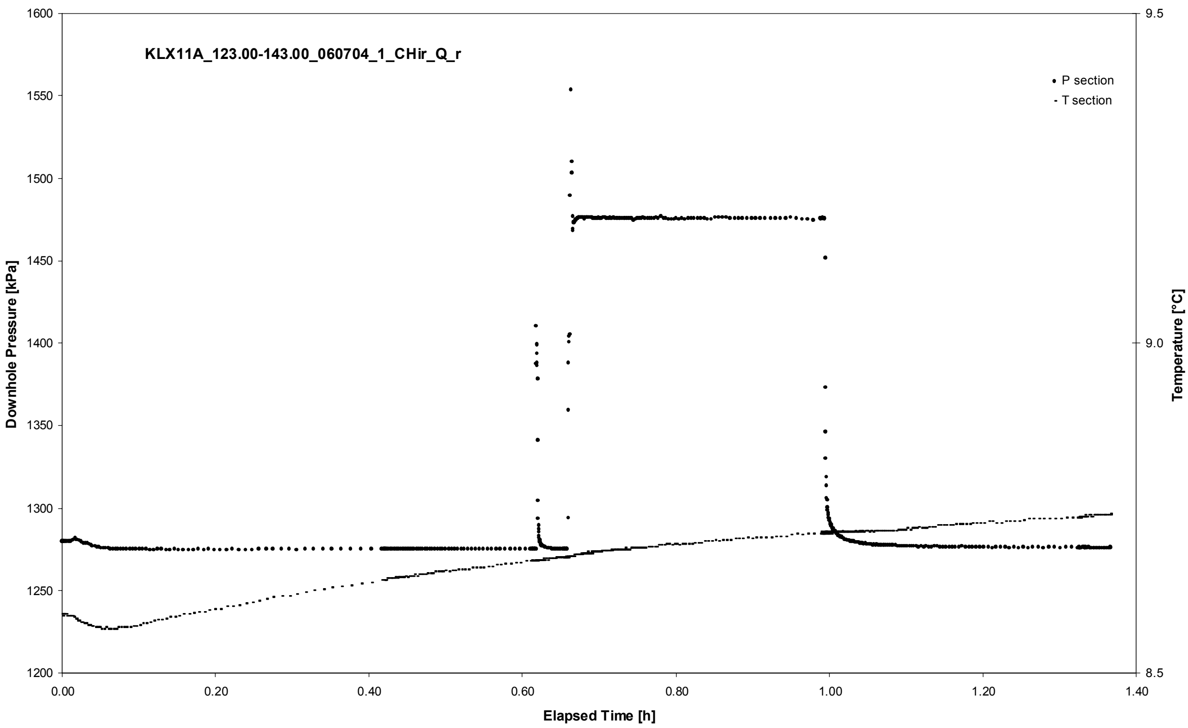
APPENDIX 2-11

Test 123.00 – 143.00 m

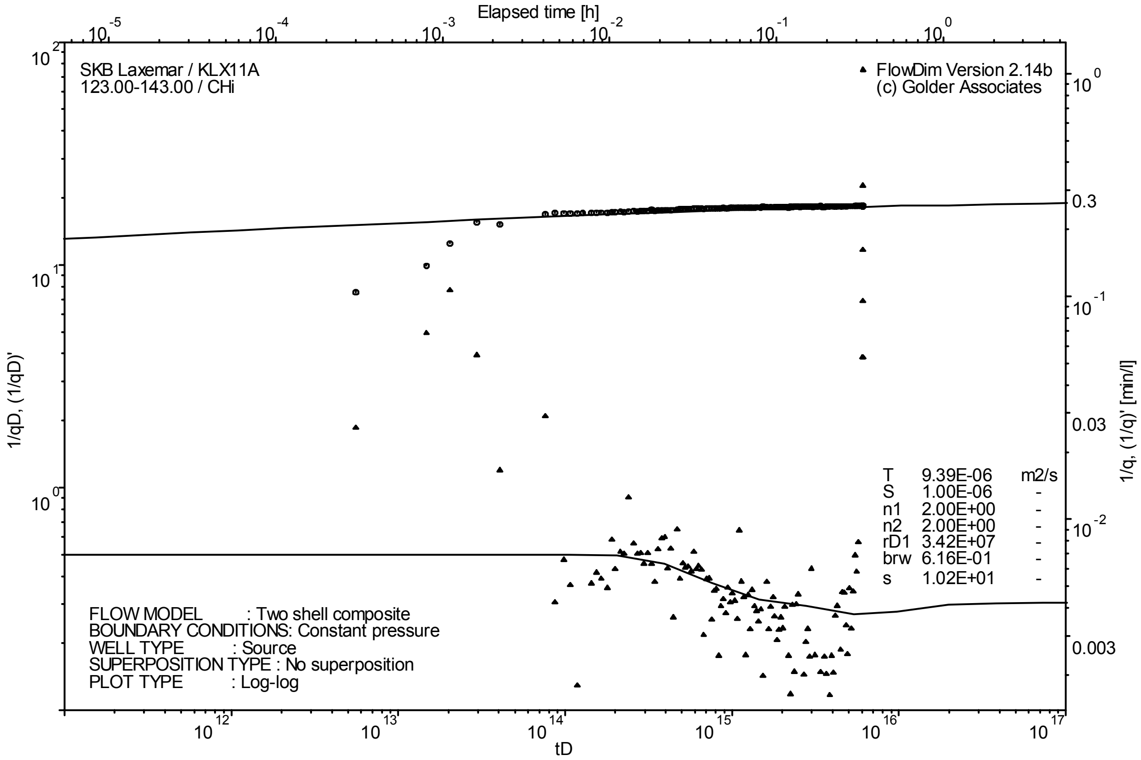
Analysis diagrams



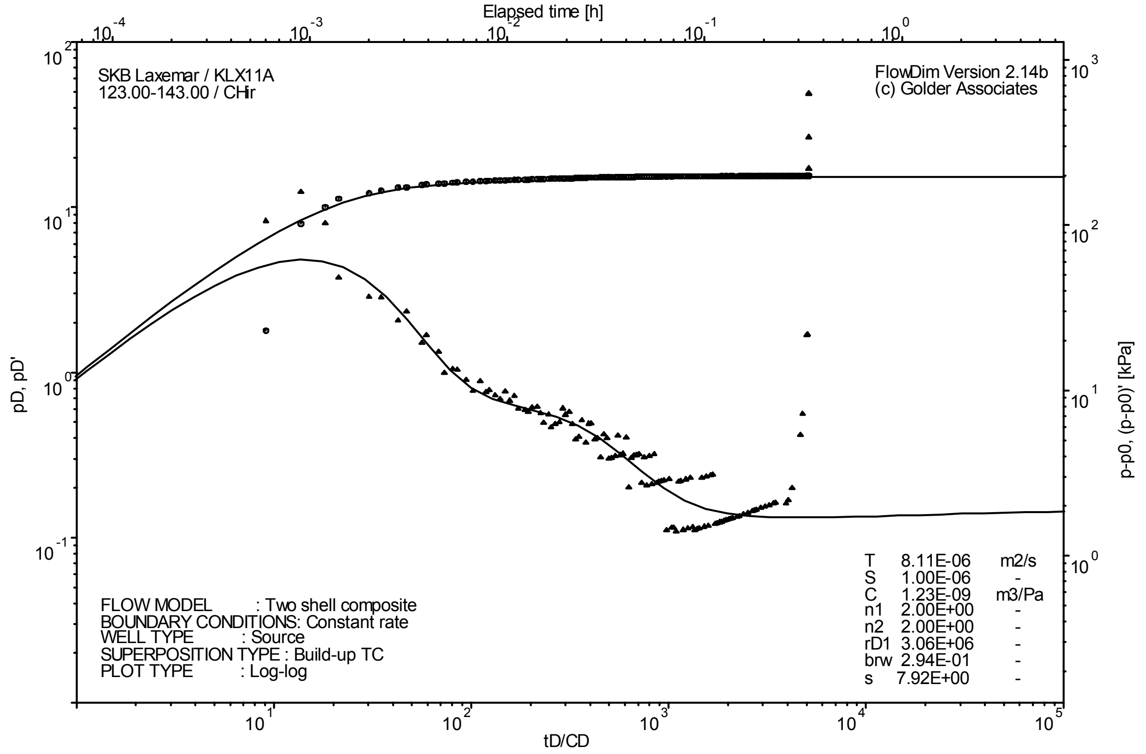
Pressure and flow rate vs. time; cartesian plot



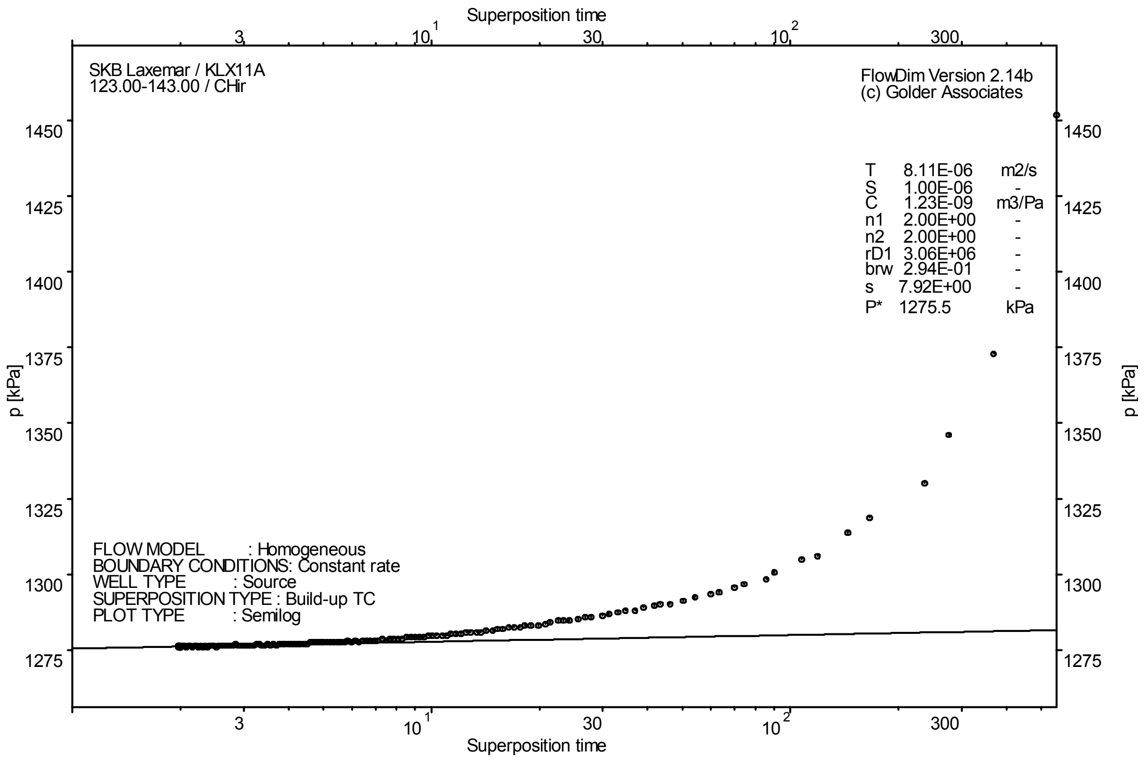
Interval pressure and temperature vs. time; cartesian plot



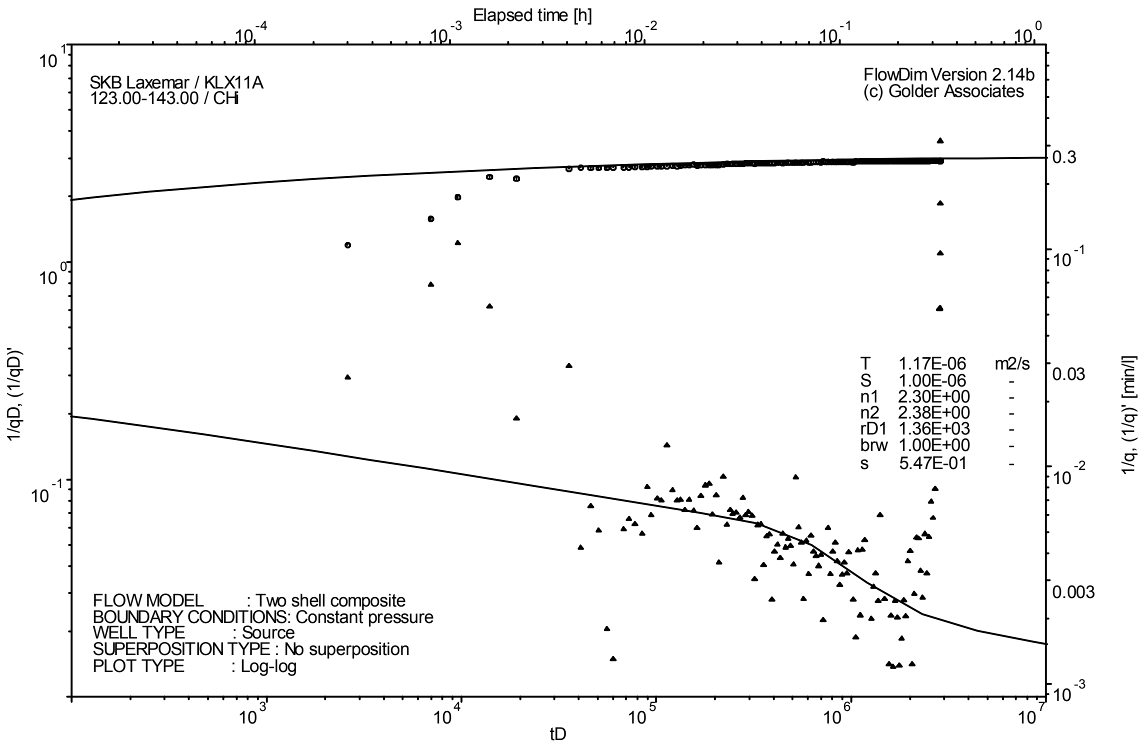
CHI phase; log-log match



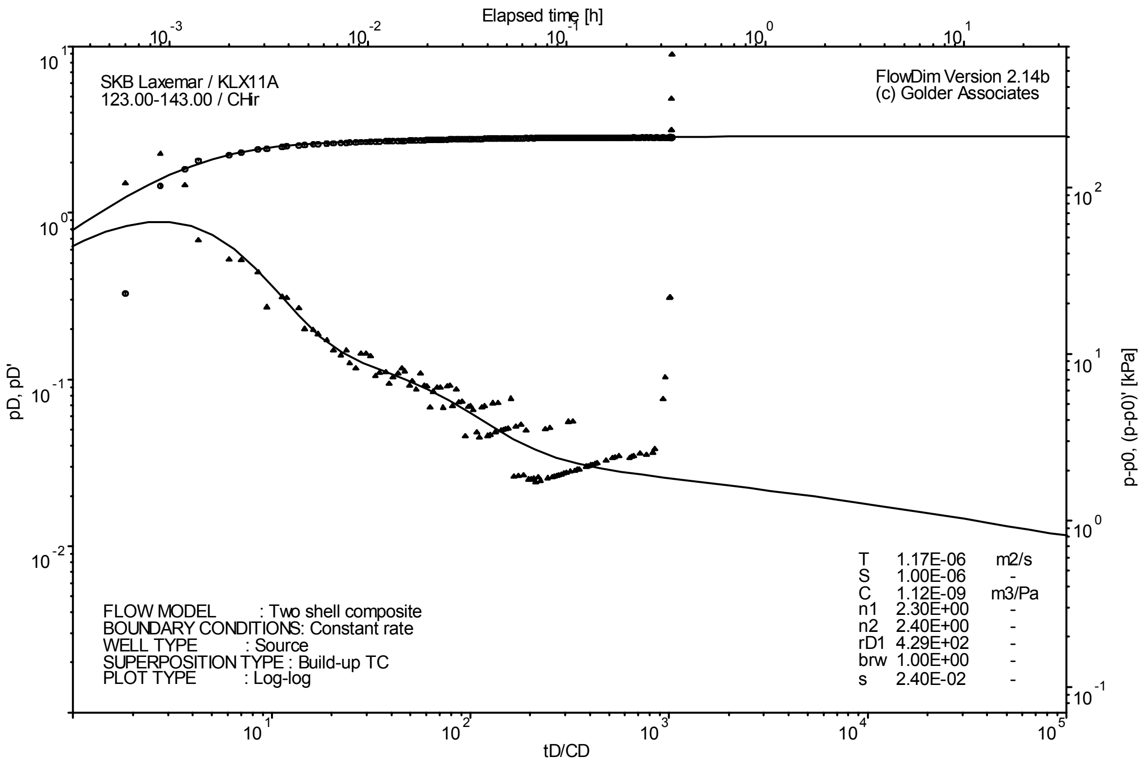
CHIR phase; log-log match



CHIR phase; HORNER match



CHI phase; log-log match (n1=2.3, n2=2.38)

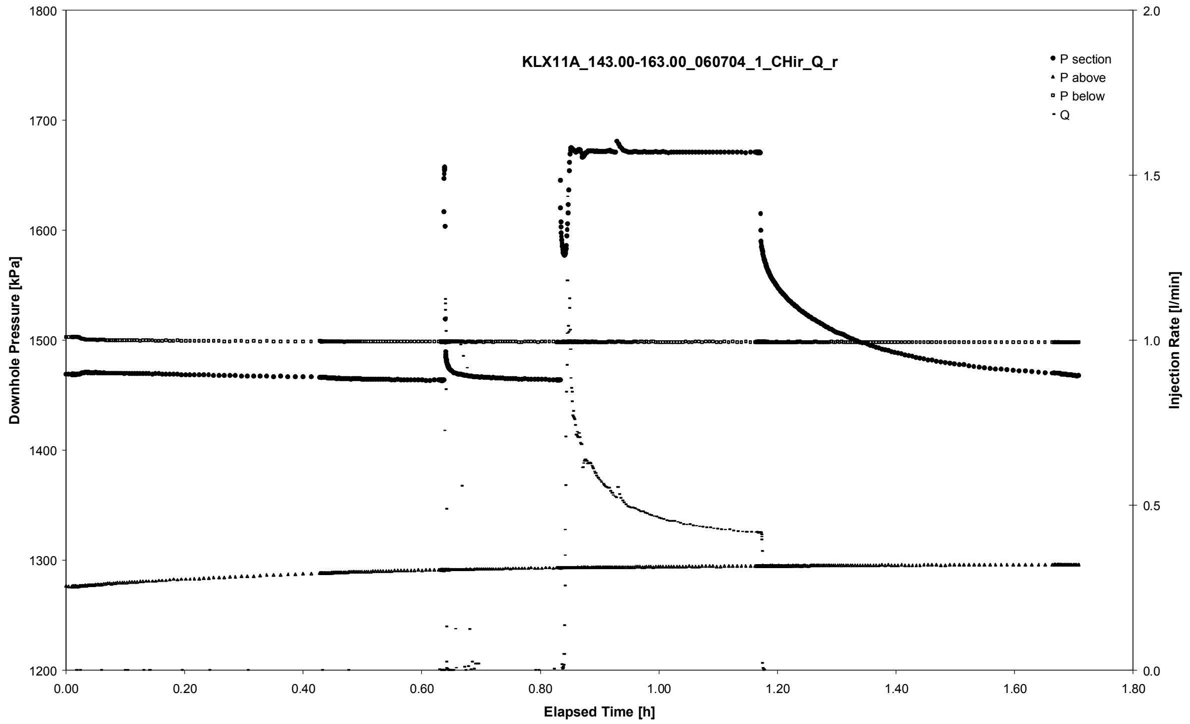


CHIR phase; log-log match (n1=2.3, n2=2.4)

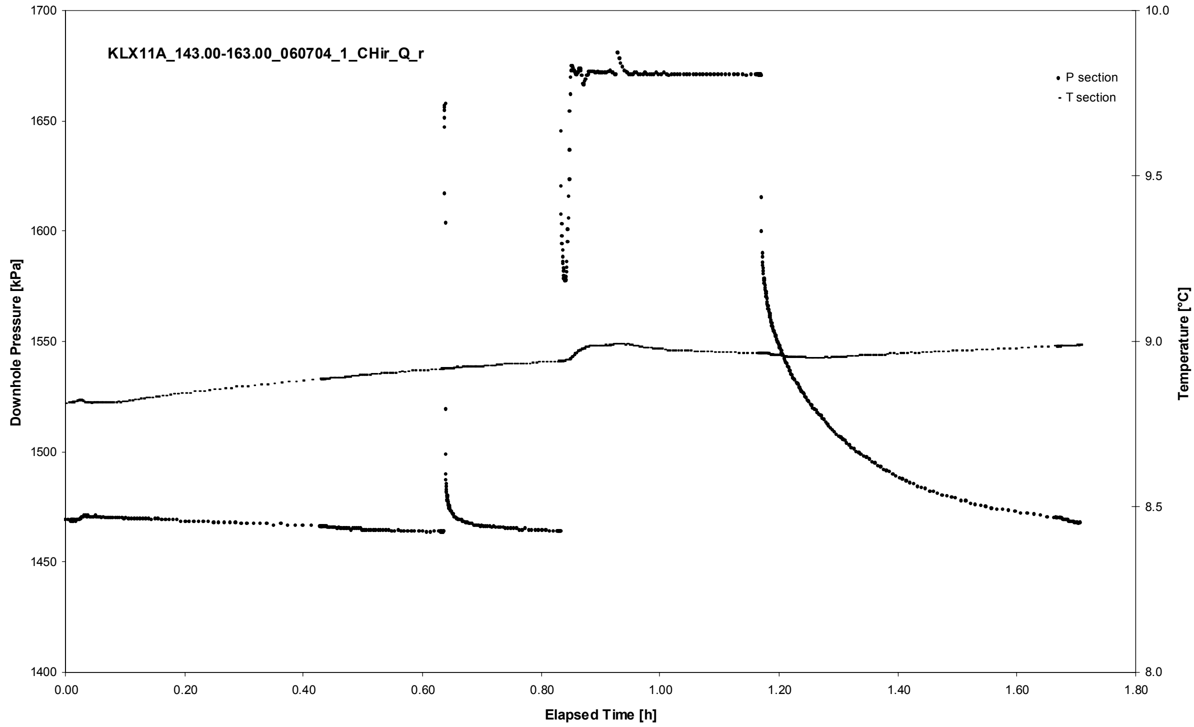
APPENDIX 2-12

Test 143.00 – 163.00 m

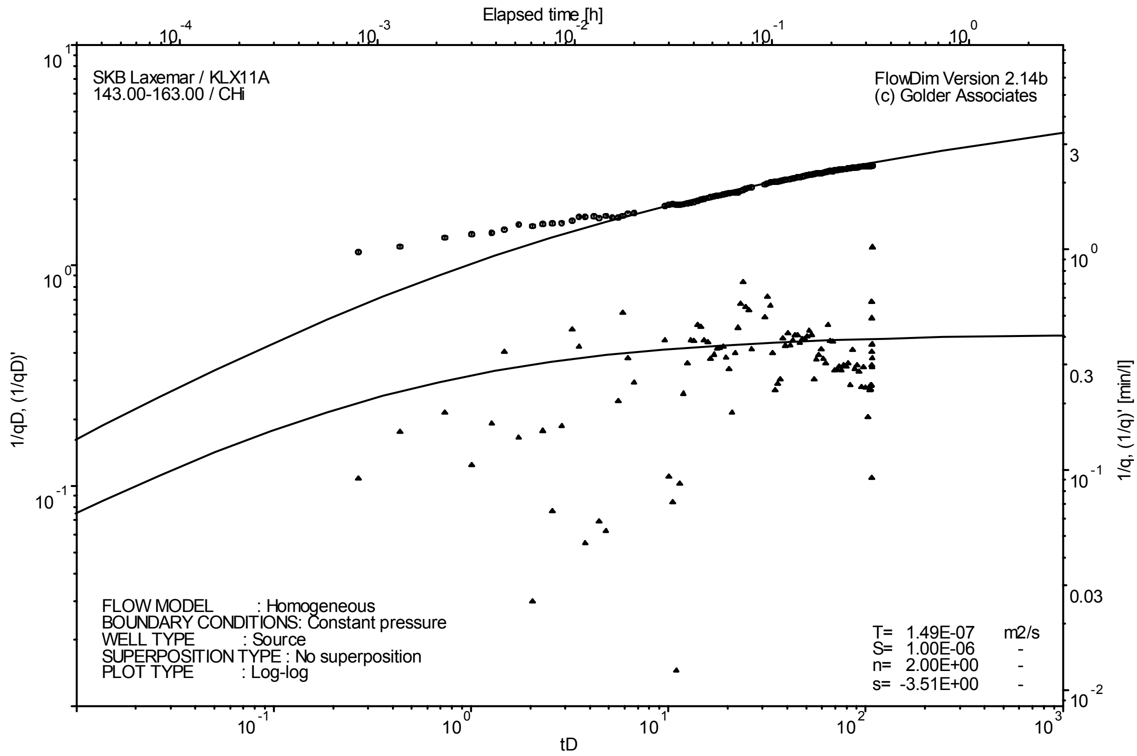
Analysis diagrams



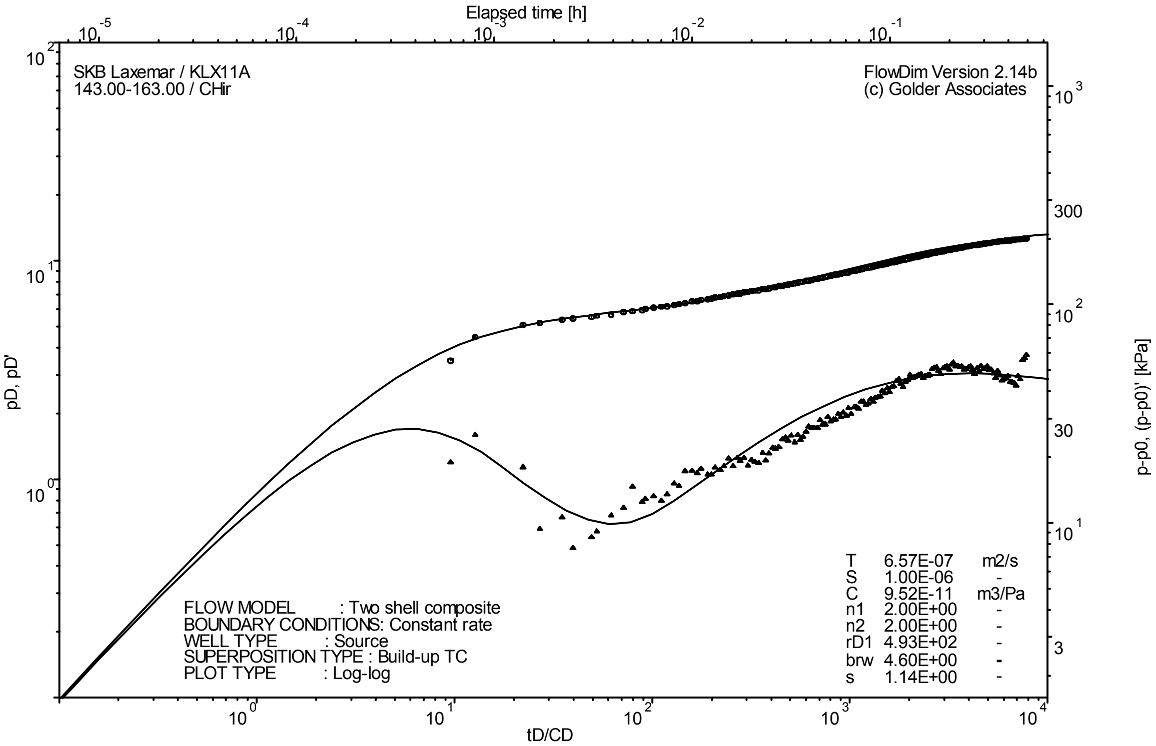
Pressure and flow rate vs. time; cartesian plot



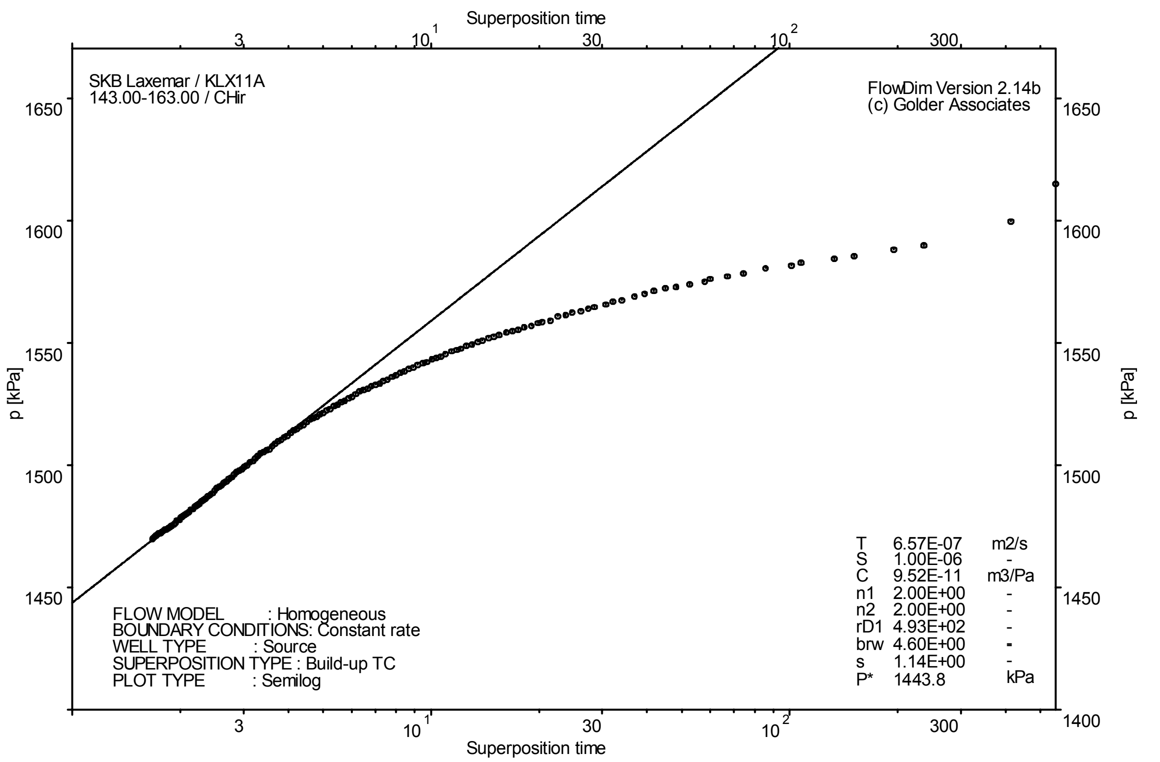
Interval pressure and temperature vs. time; cartesian plot



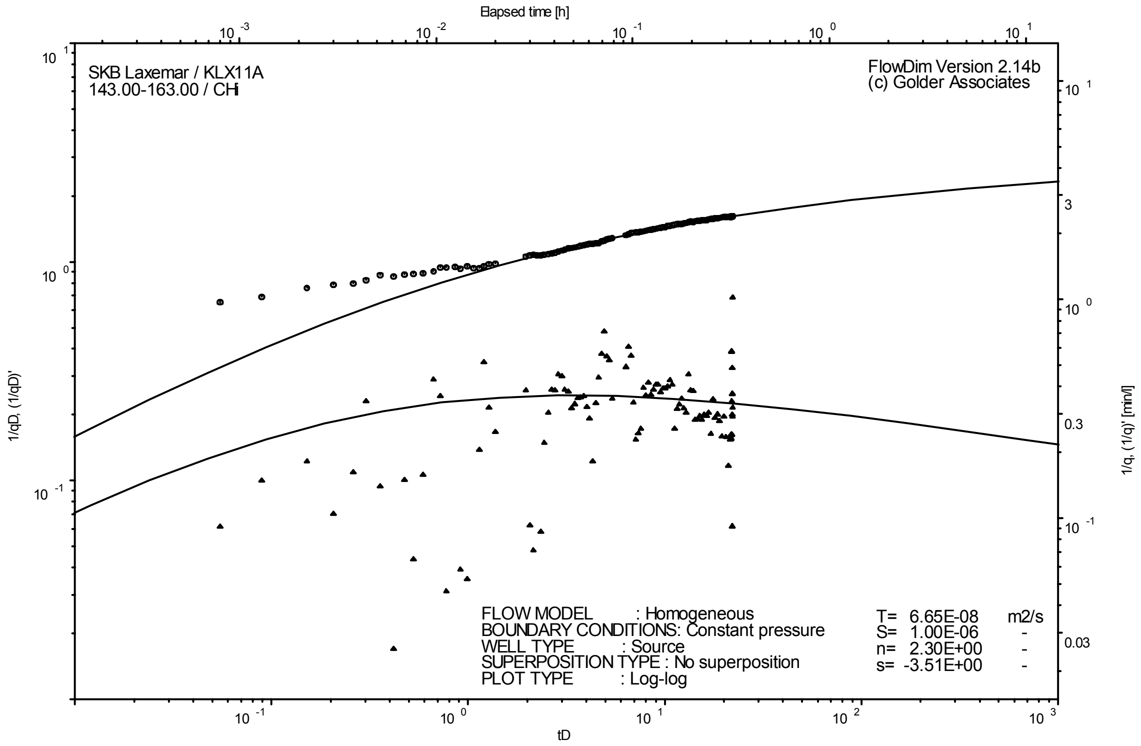
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

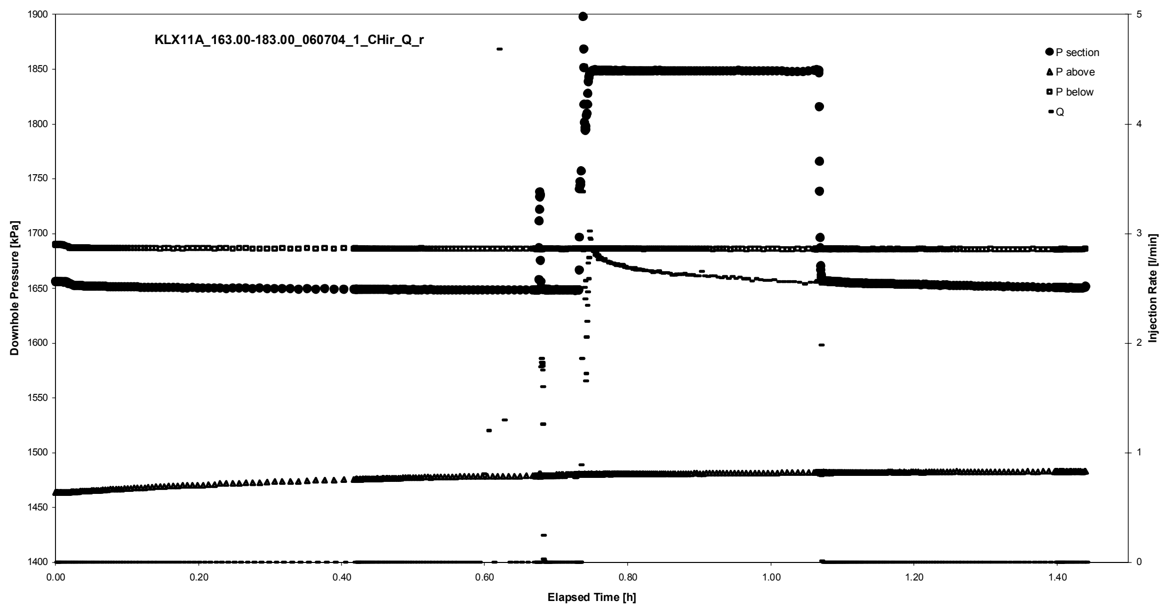


CHI phase; log-log match (n=2.3)

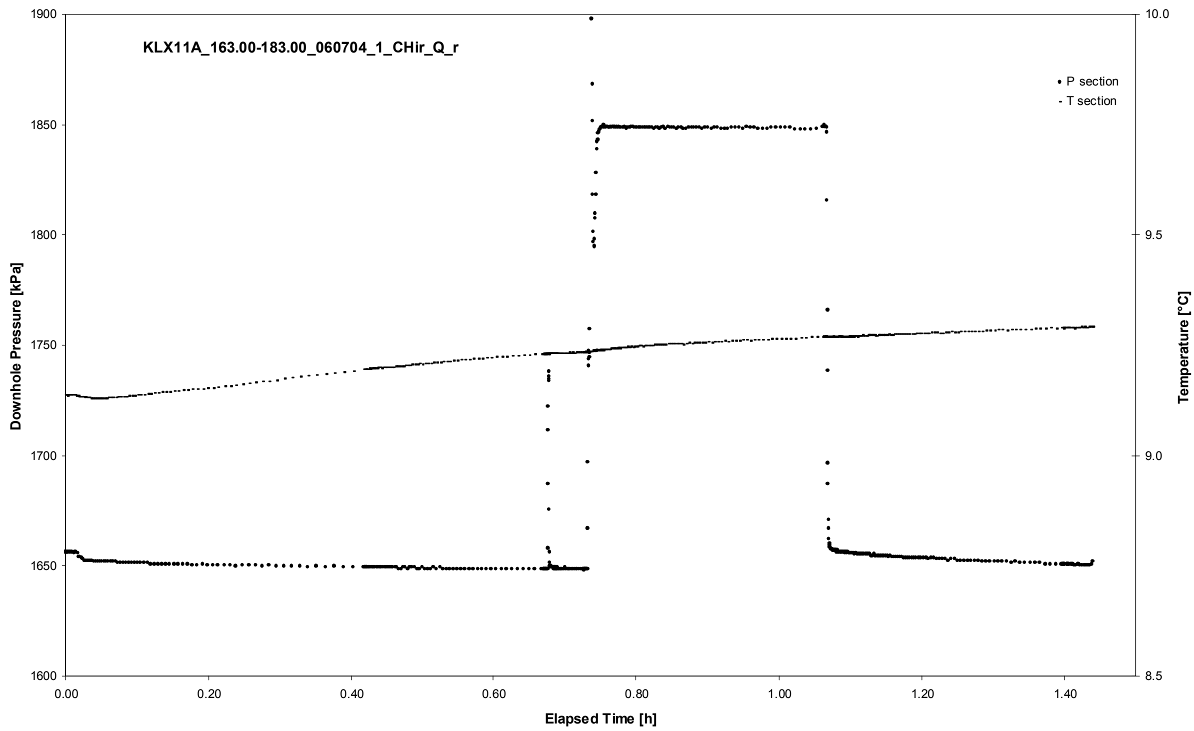
APPENDIX 2-13

Test 163.00 – 183.00 m

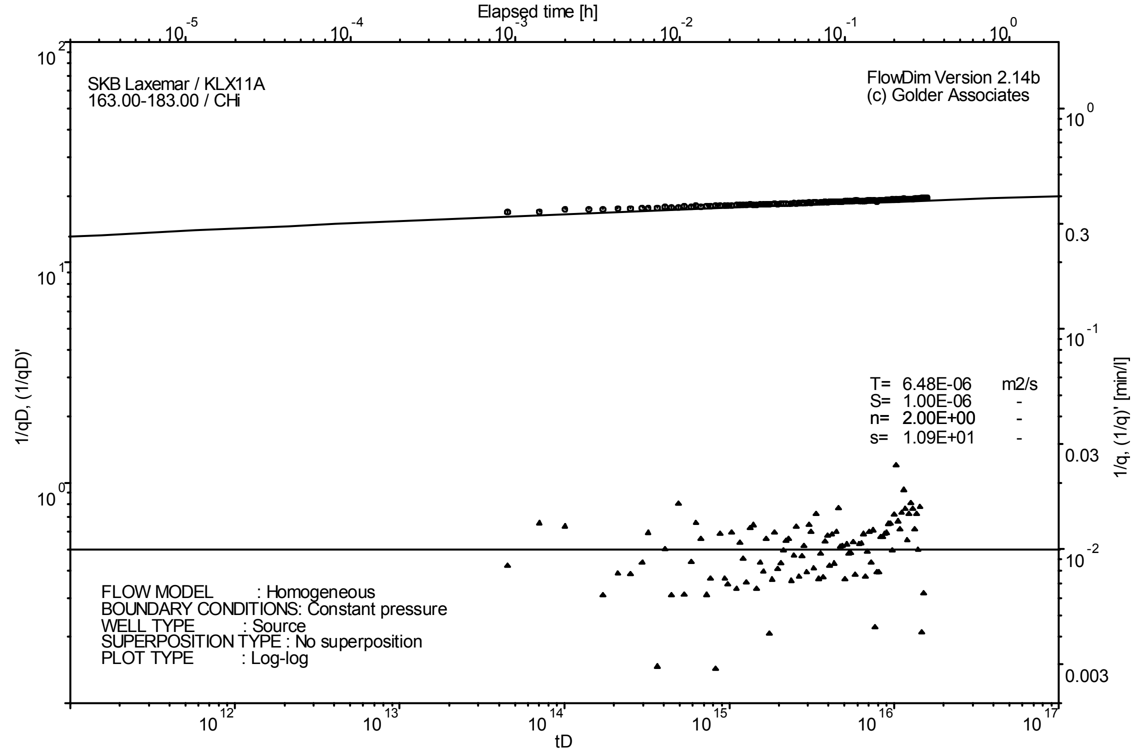
Analysis diagrams



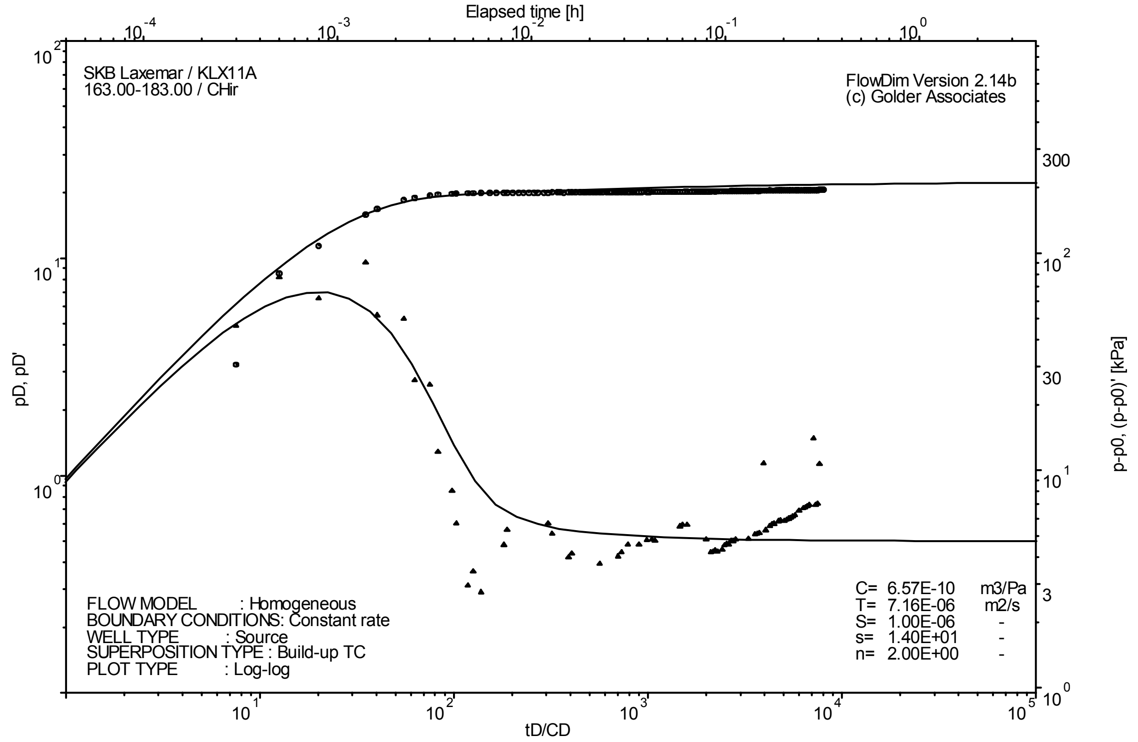
Pressure and flow rate vs. time; cartesian plot



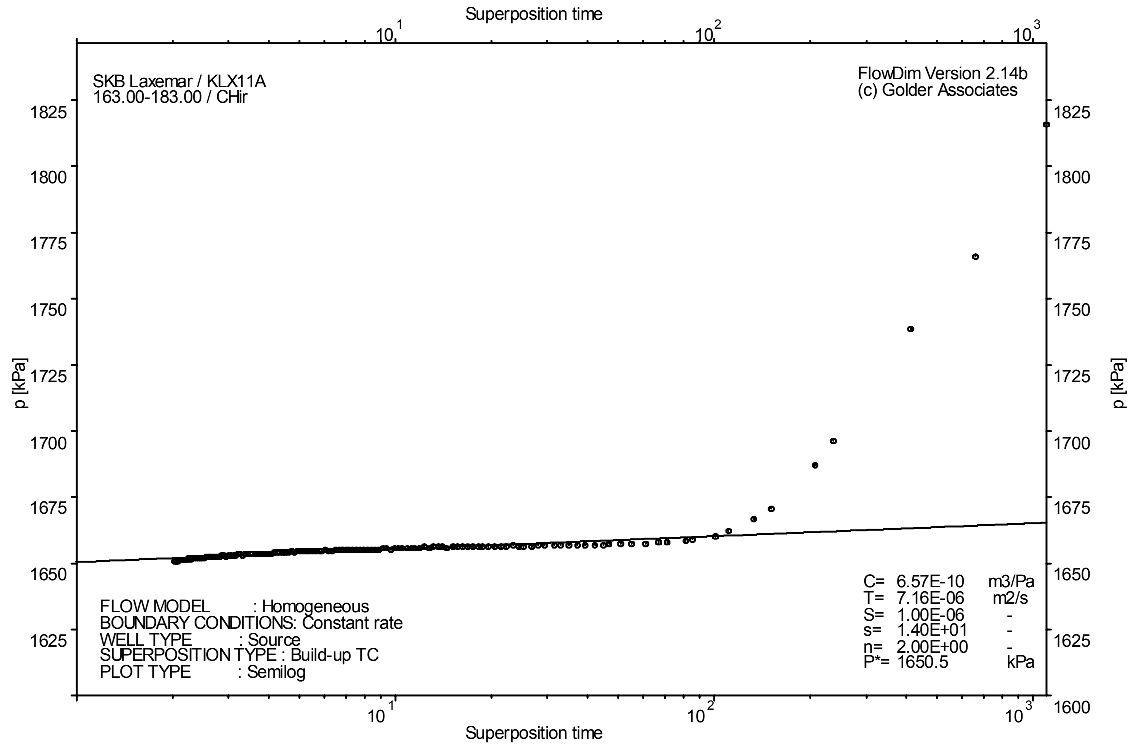
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

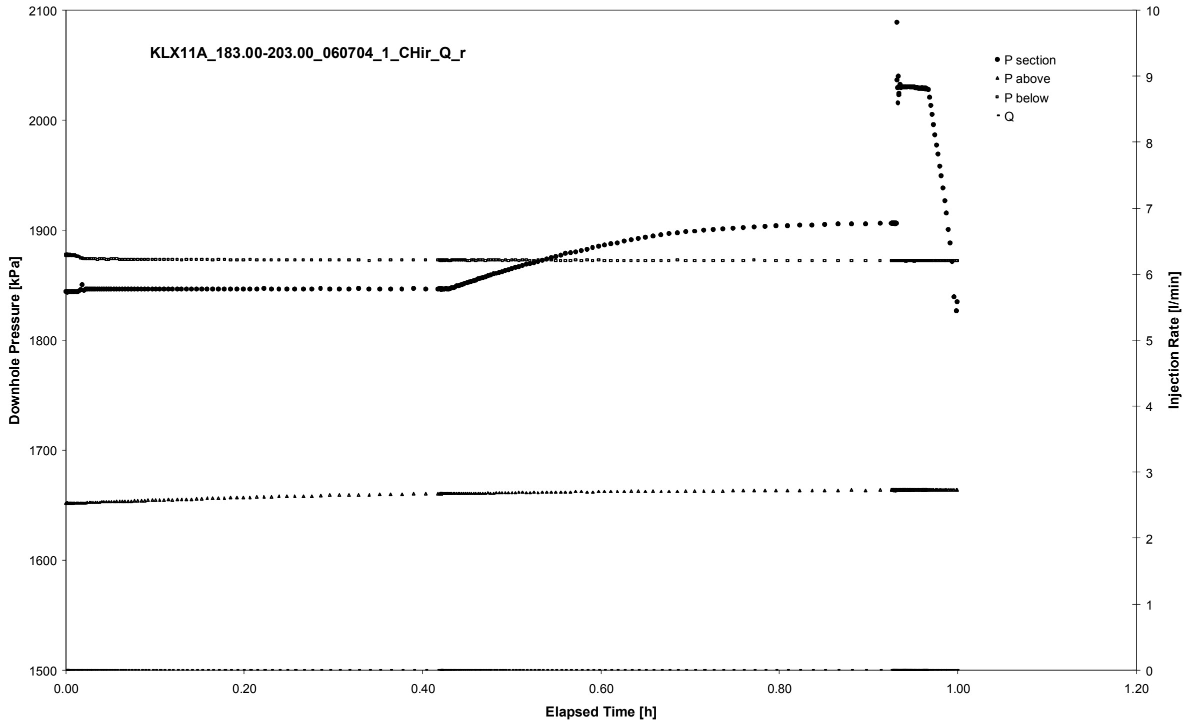


CHIR phase; HORNER match

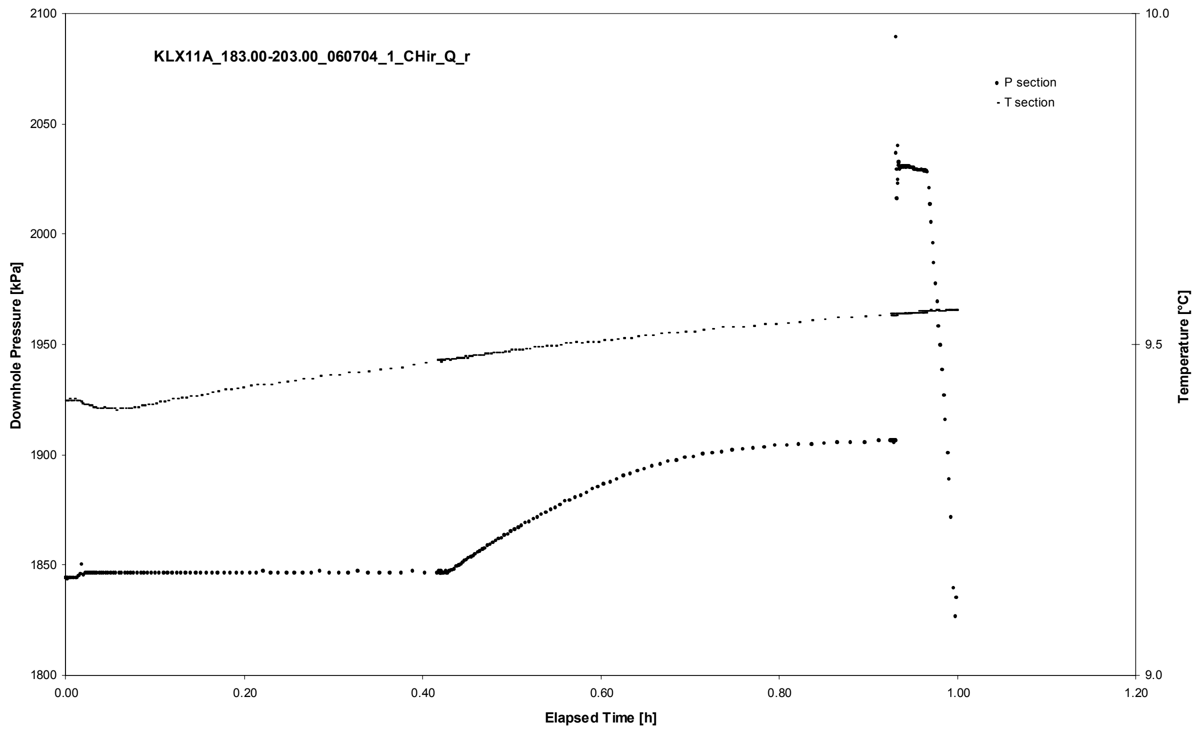
APPENDIX 2-14

Test 183.00 – 203.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

CHIR phase; log-log match

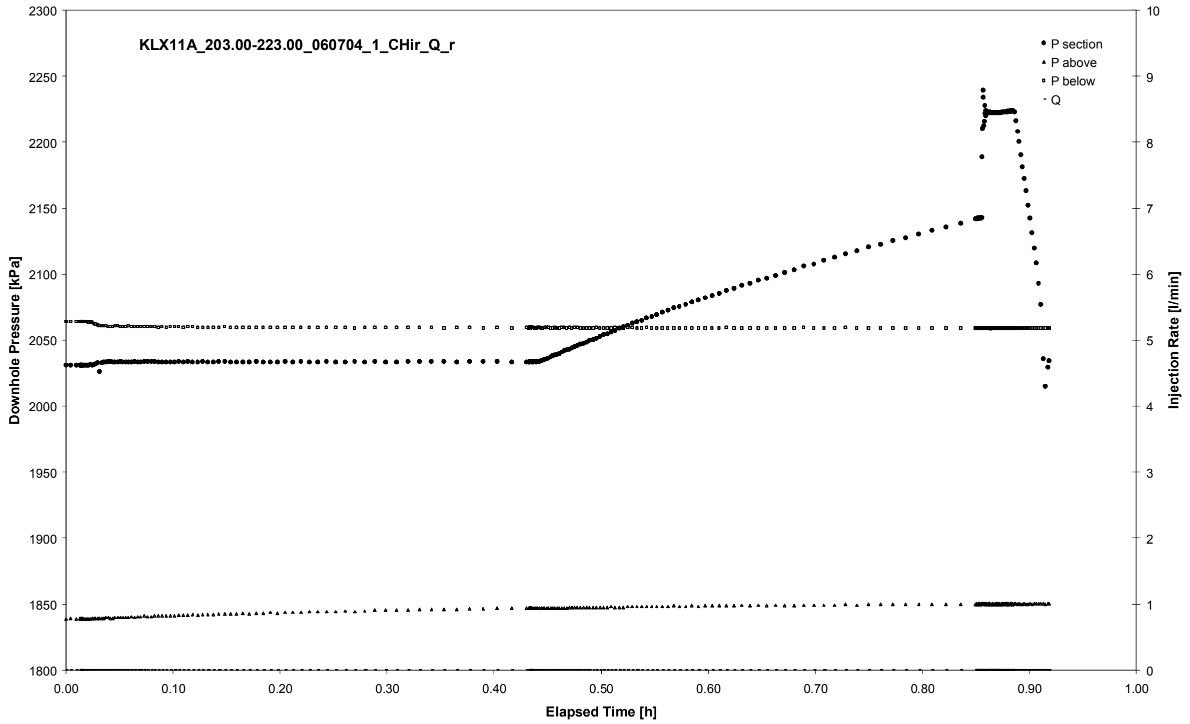
Not analysed

CHIR phase; HORNER match

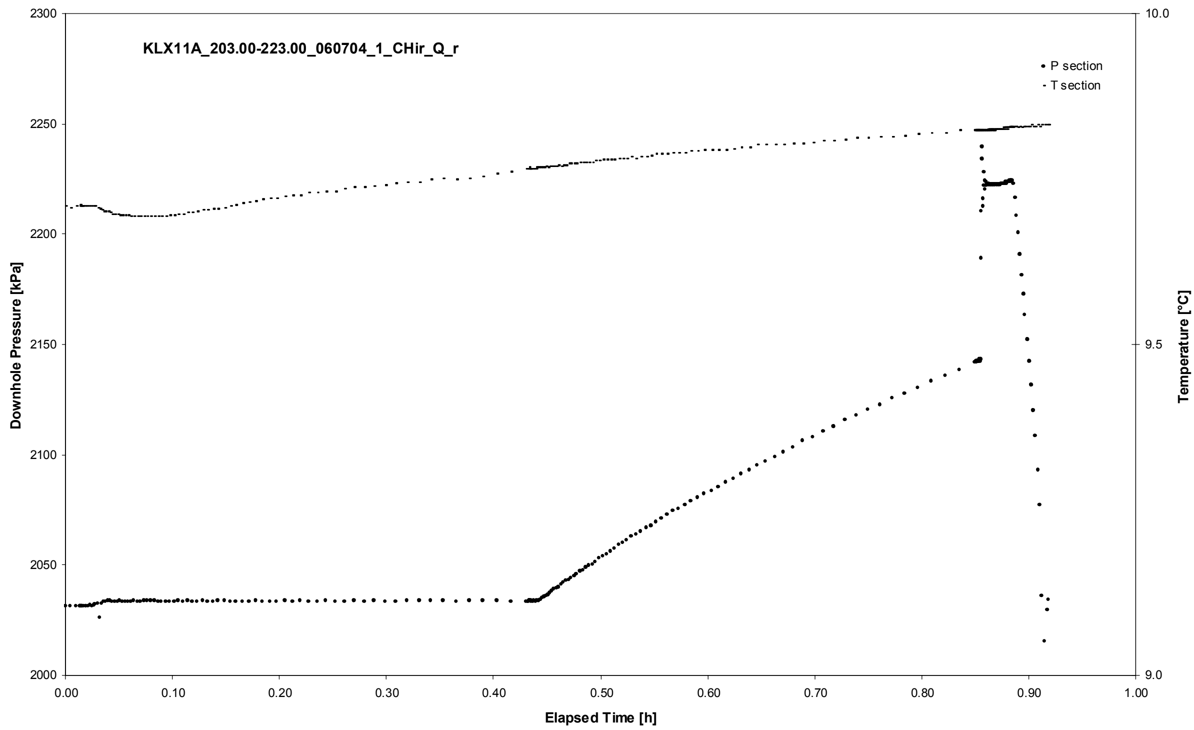
APPENDIX 2-15

Test 203.00 – 223.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

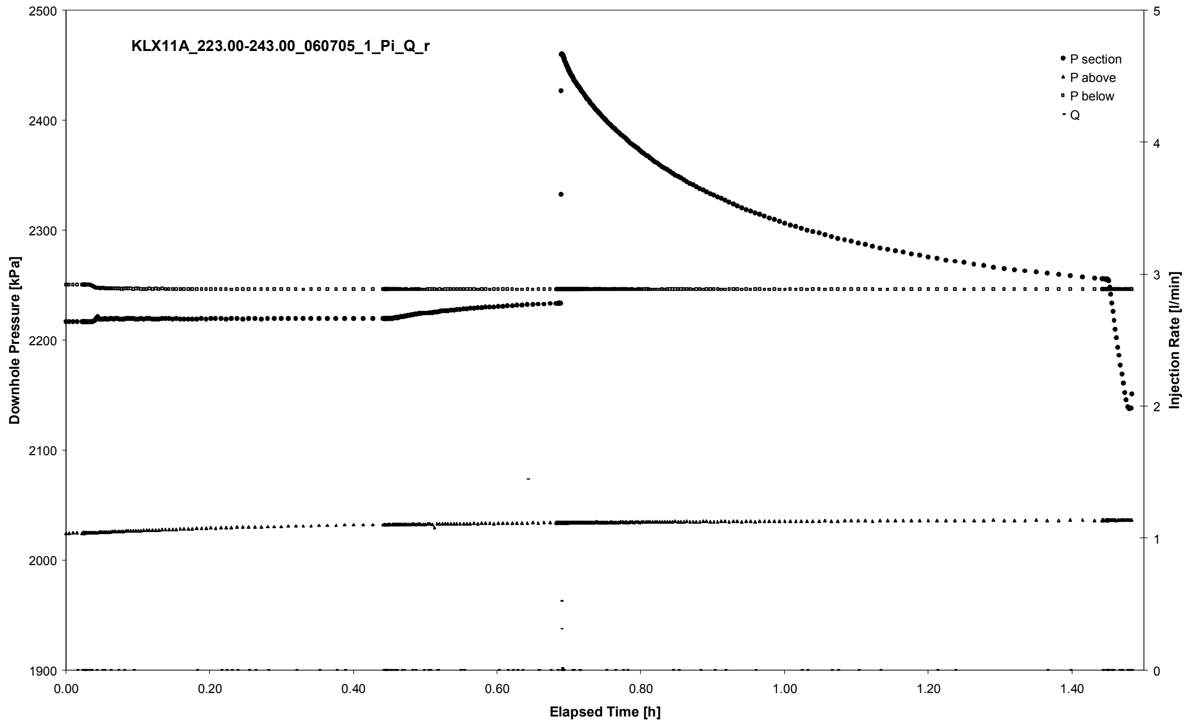
CHIR phase; log-log match

Not analysed

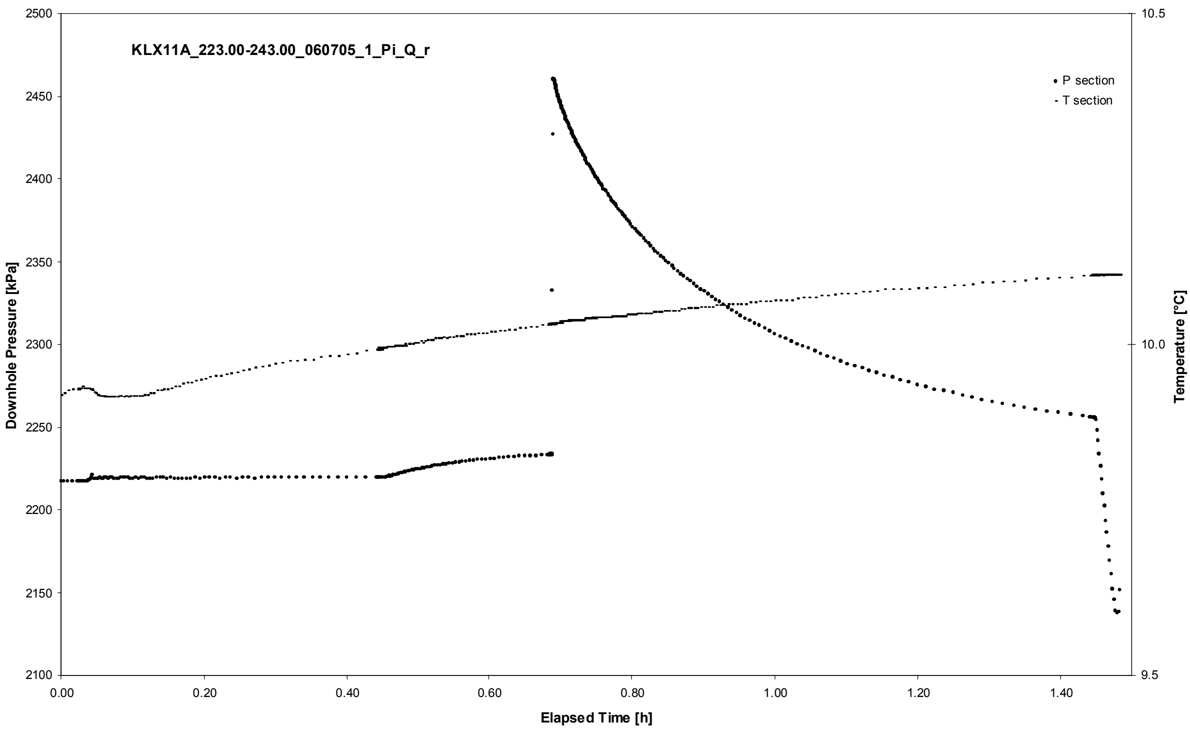
APPENDIX 2-16

Test 223.00 – 243.00 m

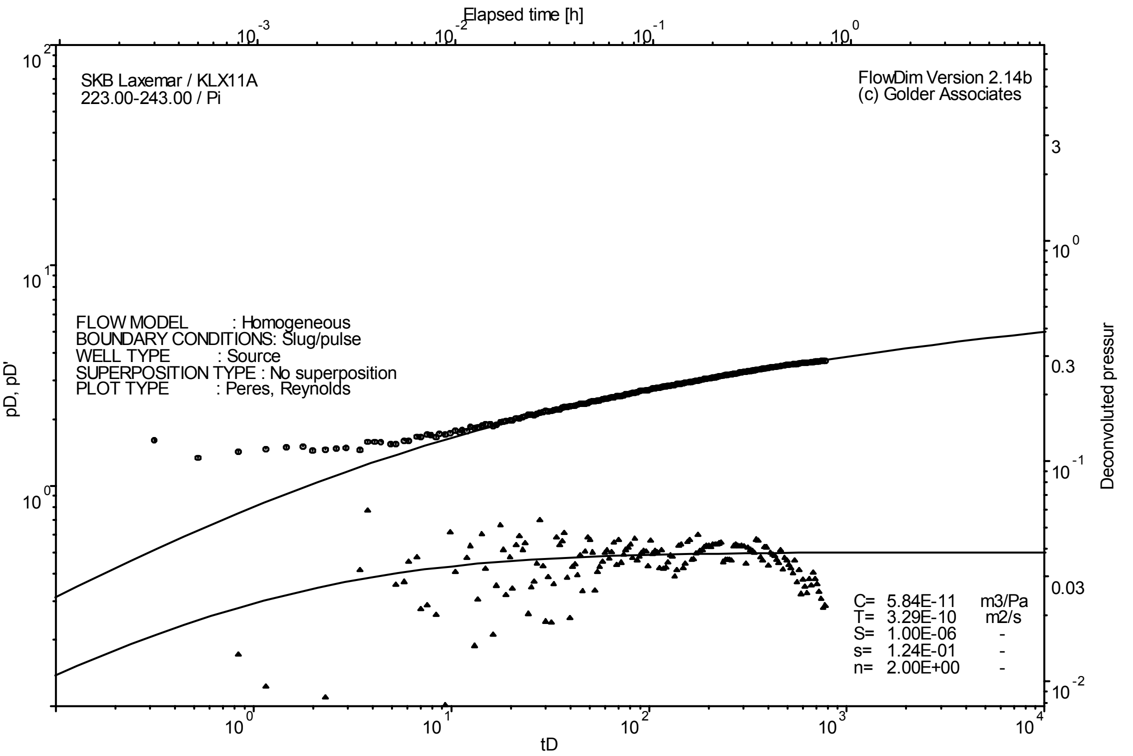
Analysis diagrams



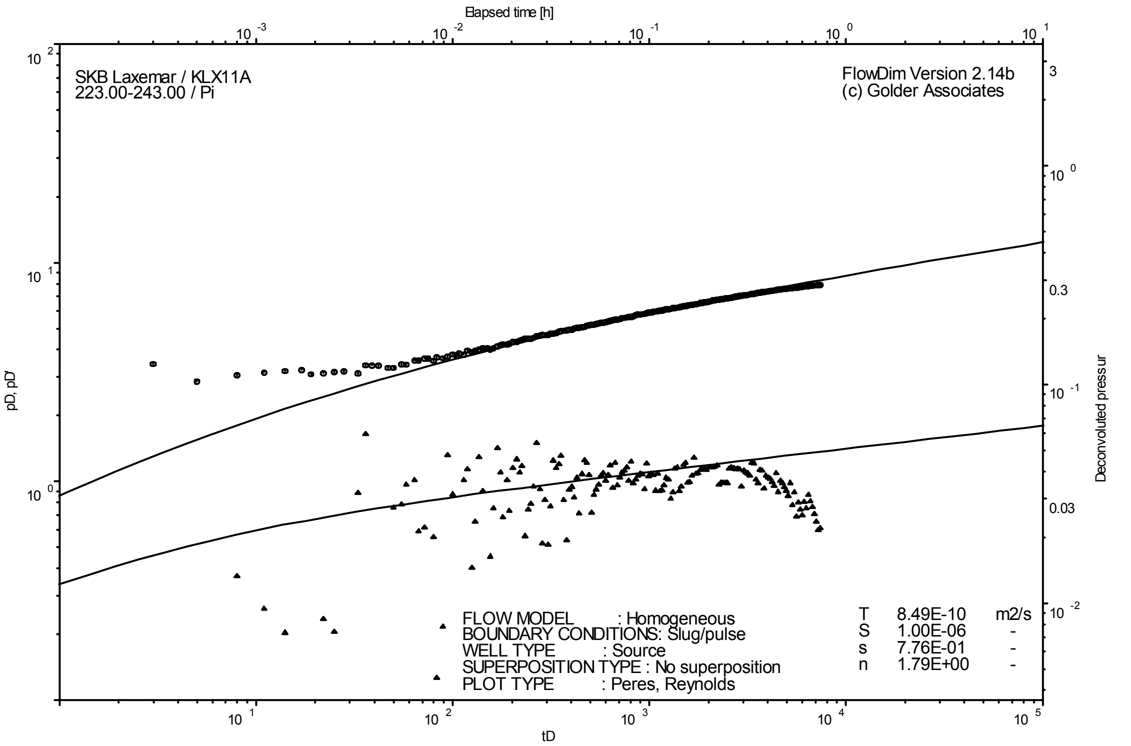
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



Pulse injection; deconvolution match

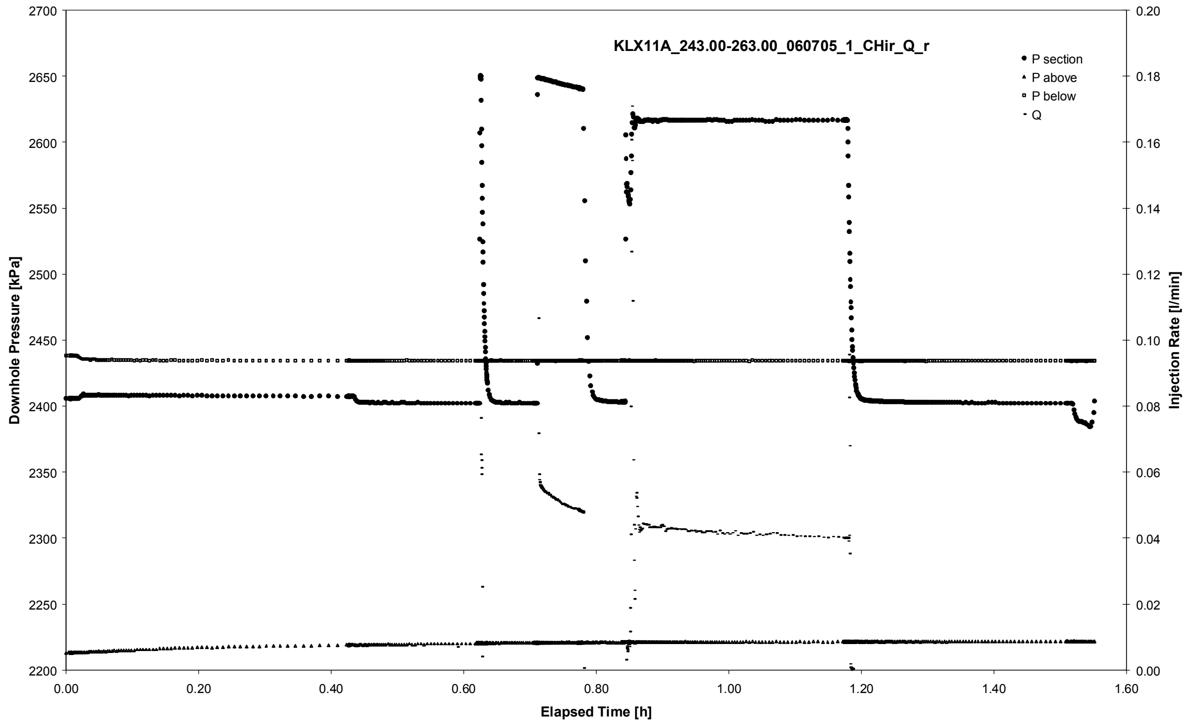


Pulse injection; deconvolution match (n=1.79)

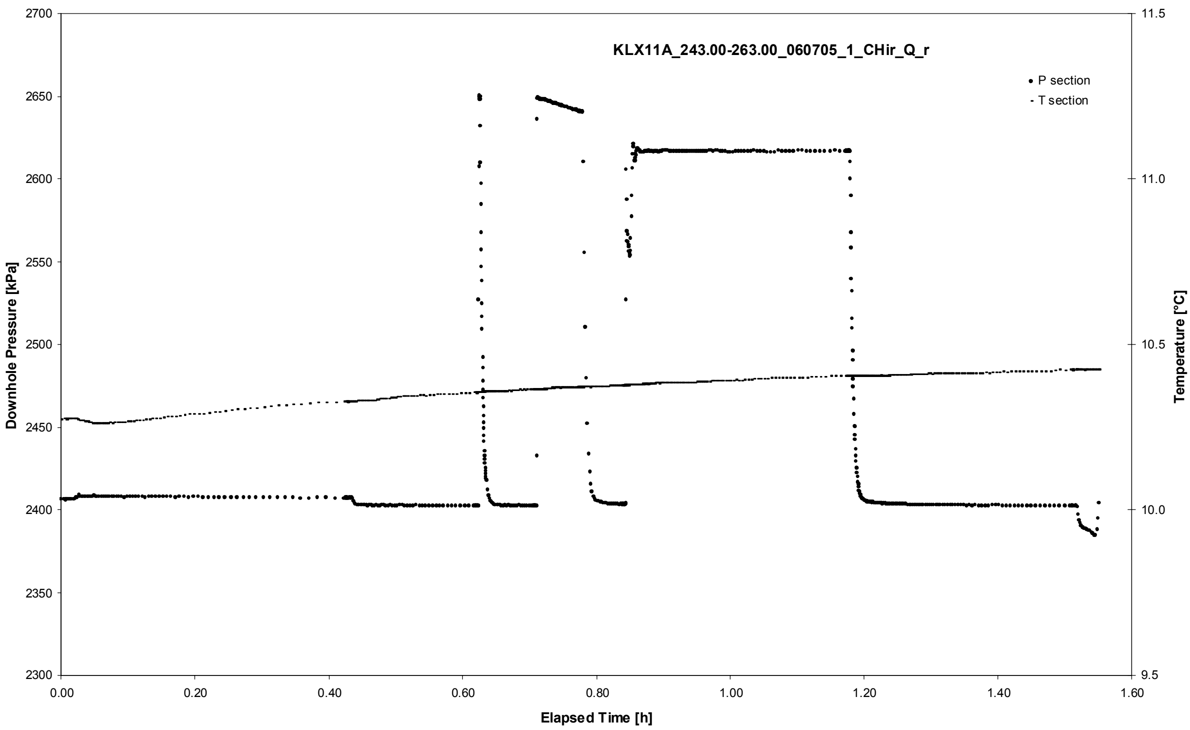
APPENDIX 2-17

Test 243.00 – 263.00 m

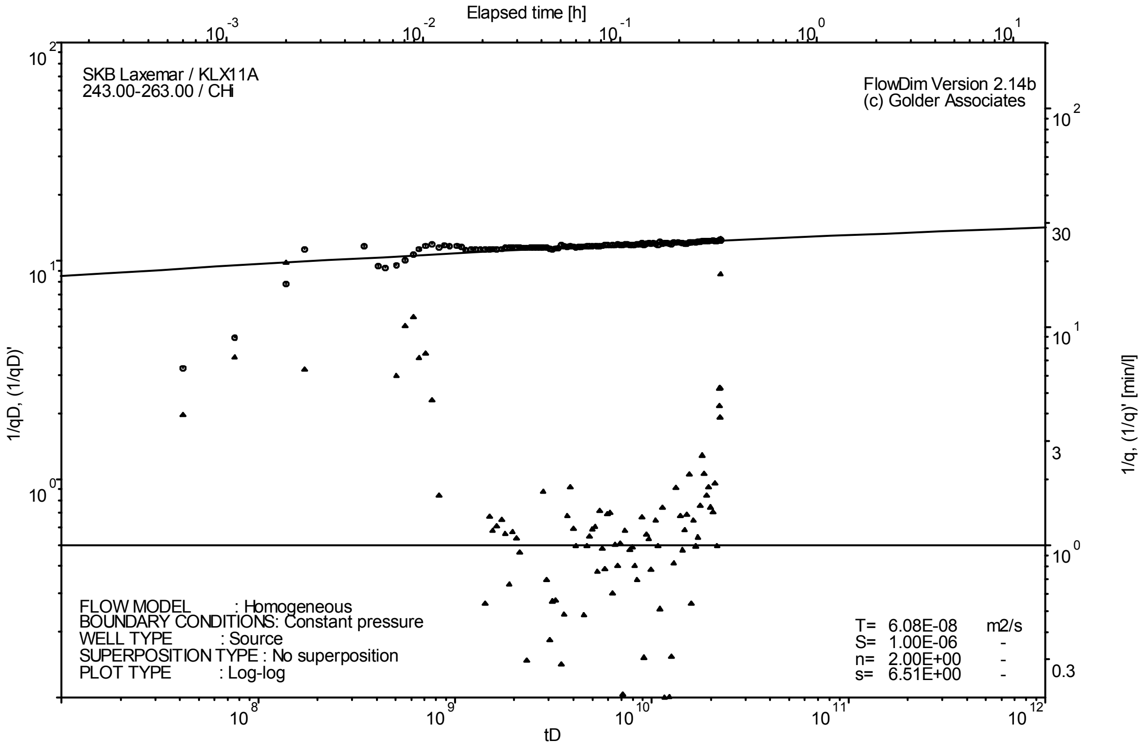
Analysis diagrams



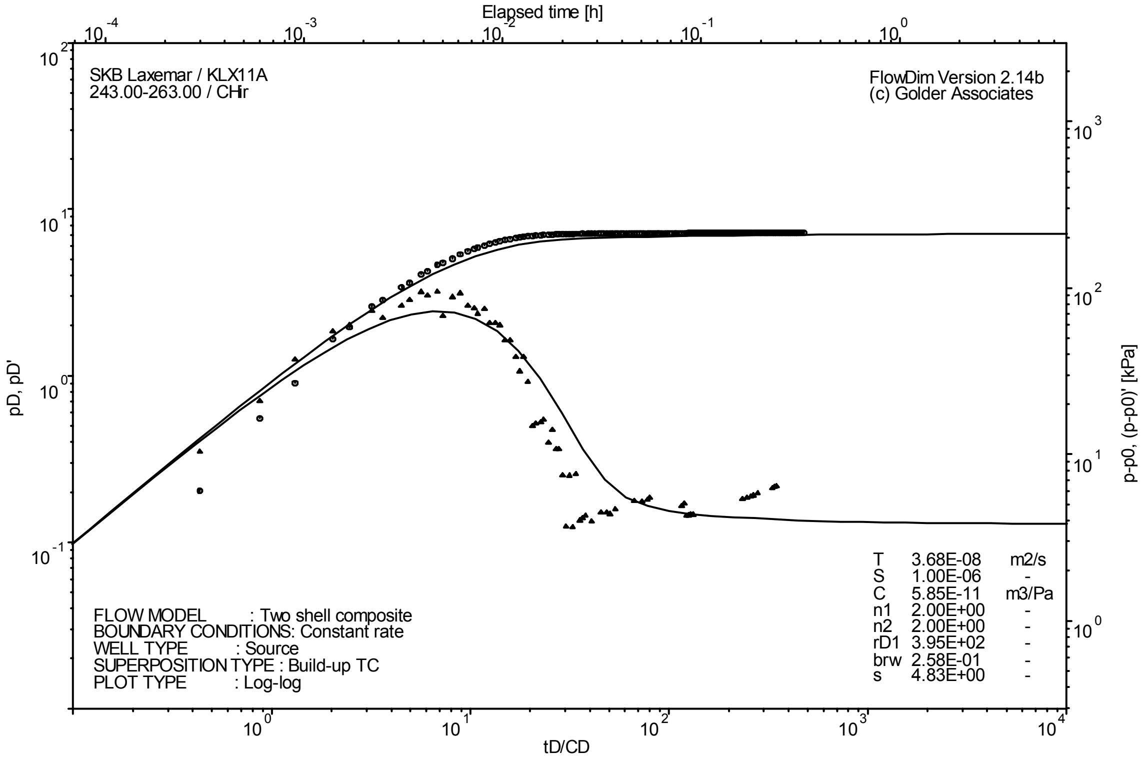
Pressure and flow rate vs. time; cartesian plot



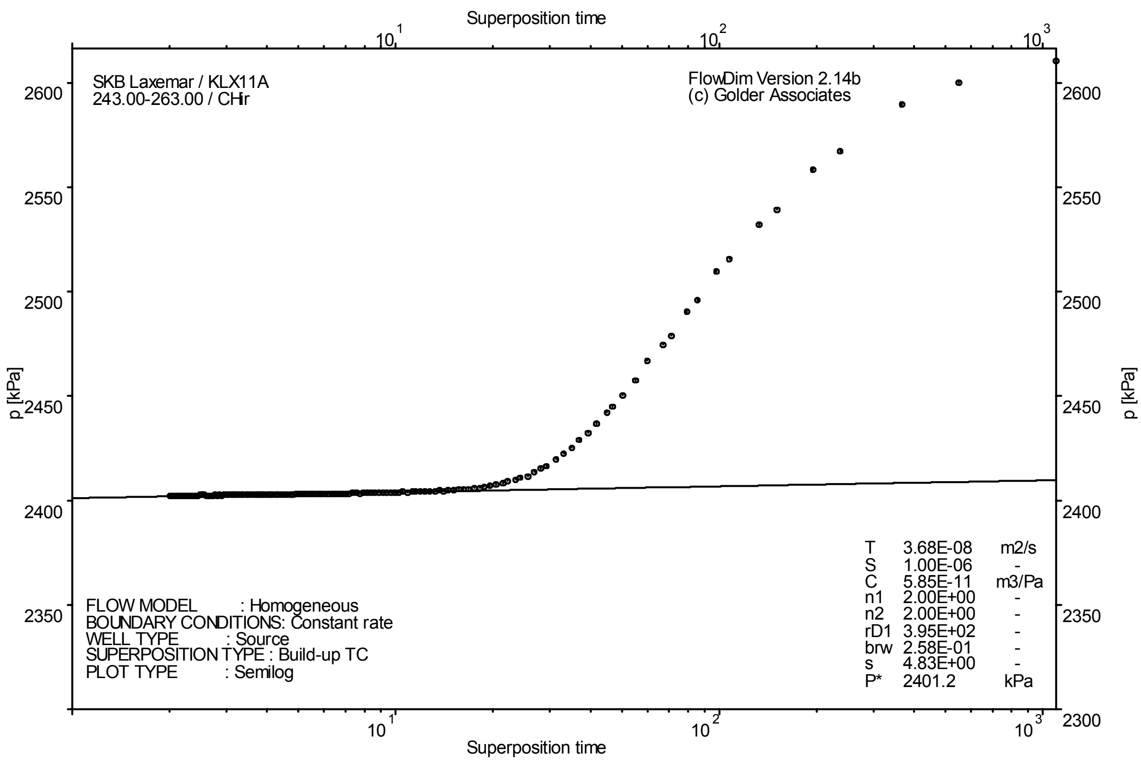
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

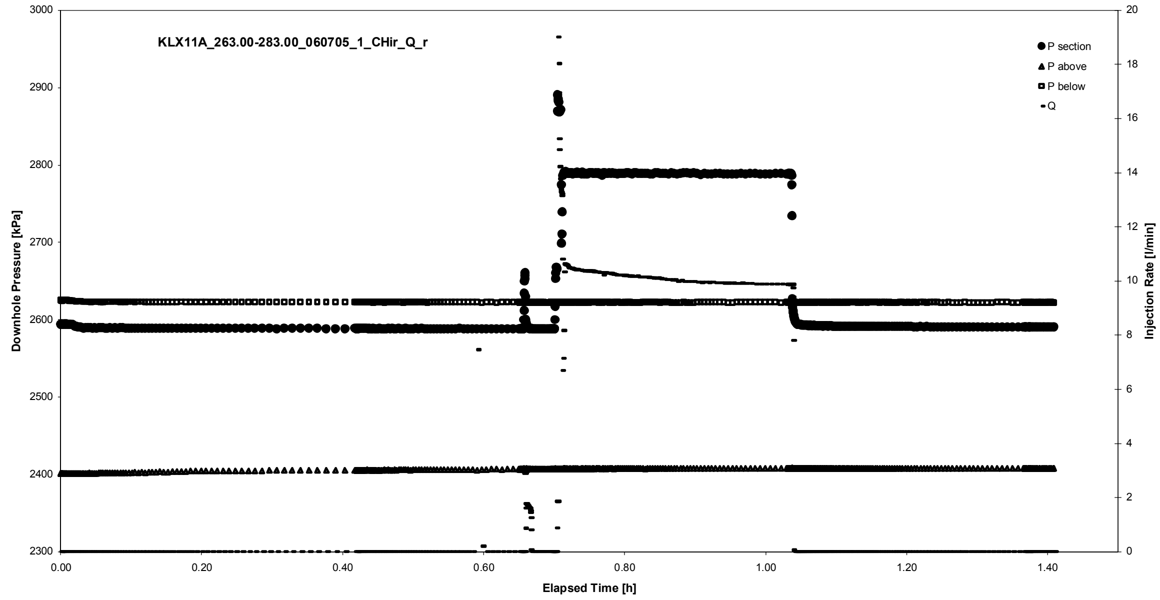


CHIR phase; HORNER match

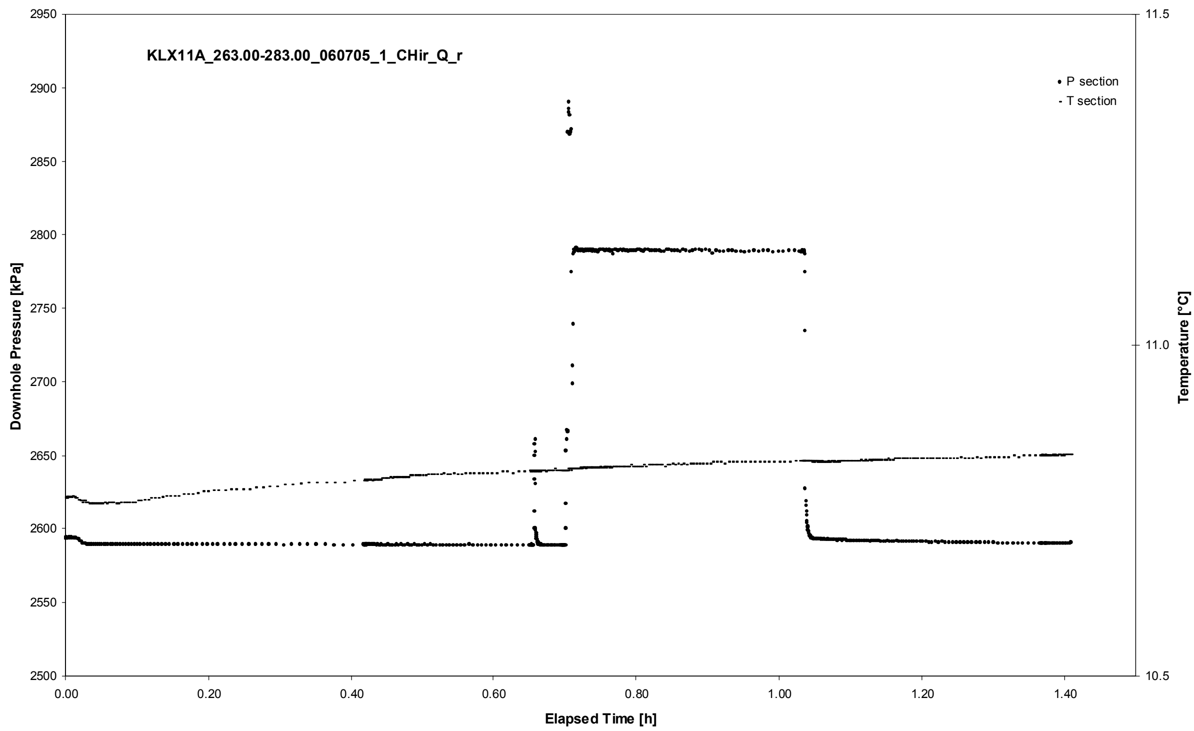
APPENDIX 2-18

Test 263.00 – 283.00 m

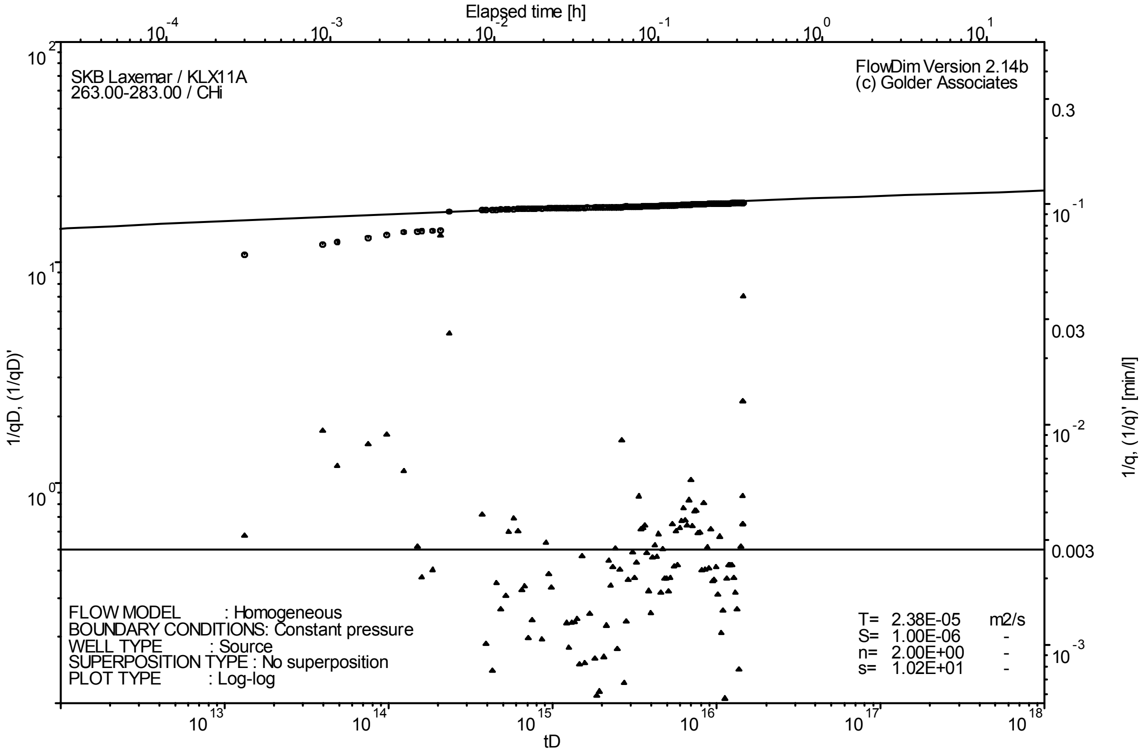
Analysis diagrams



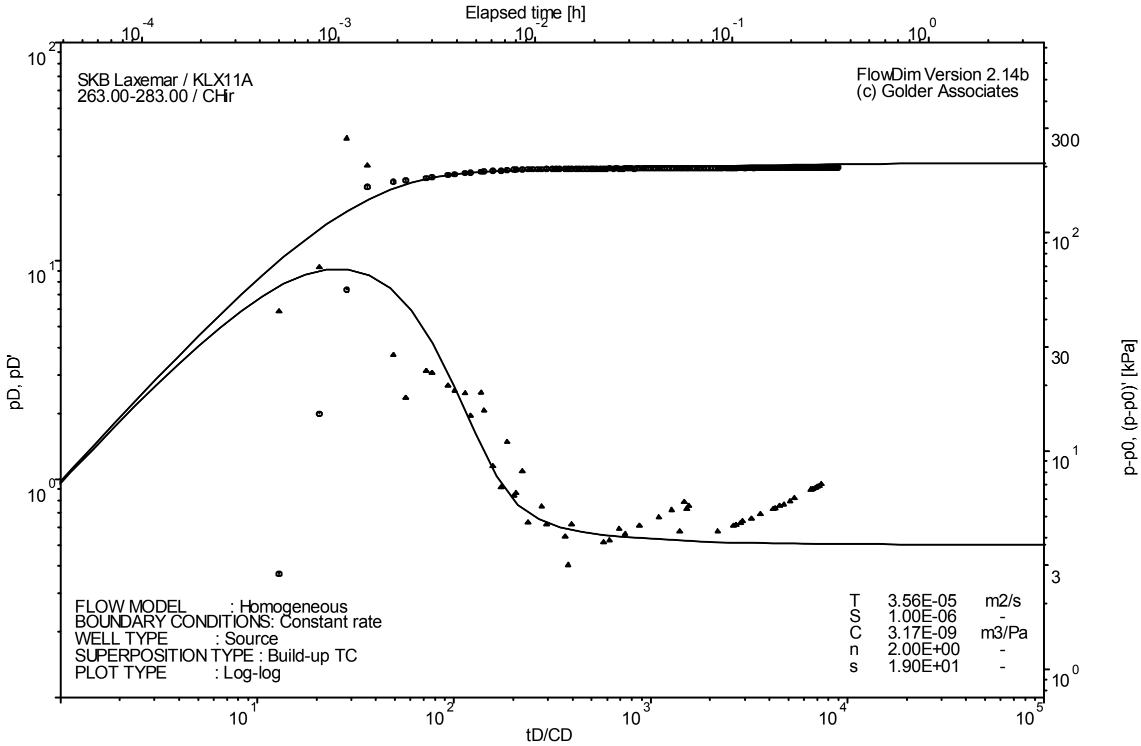
Pressure and flow rate vs. time; cartesian plot



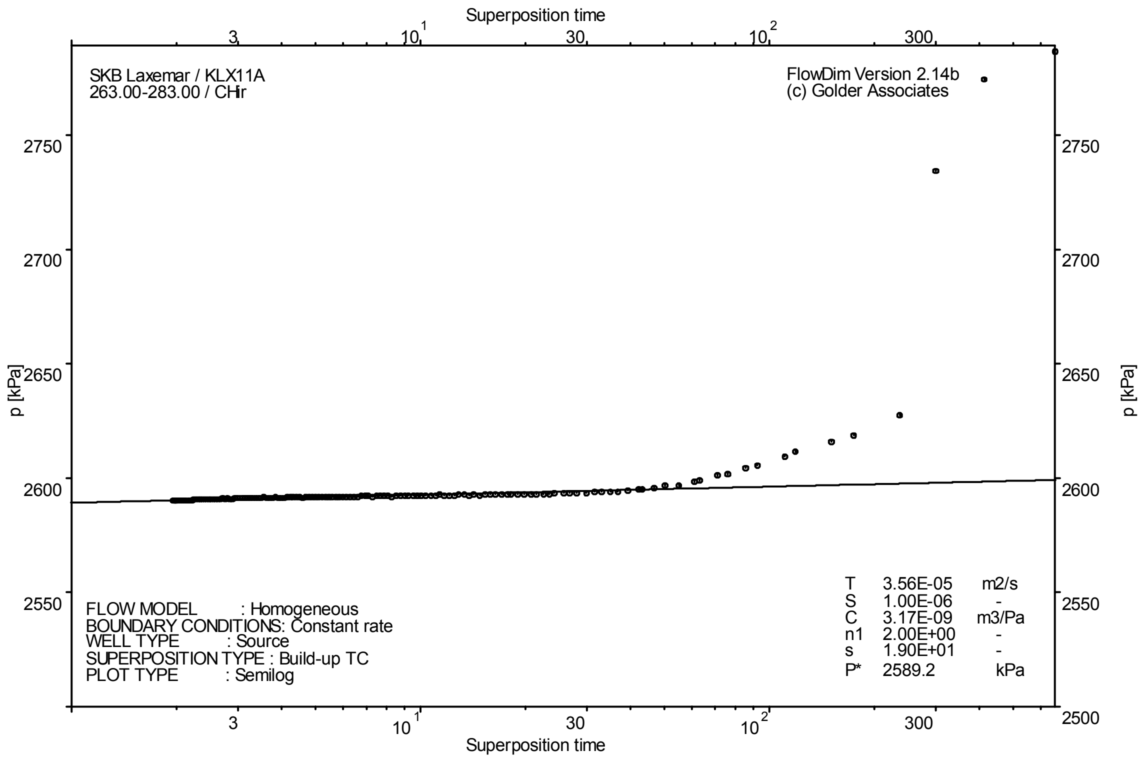
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

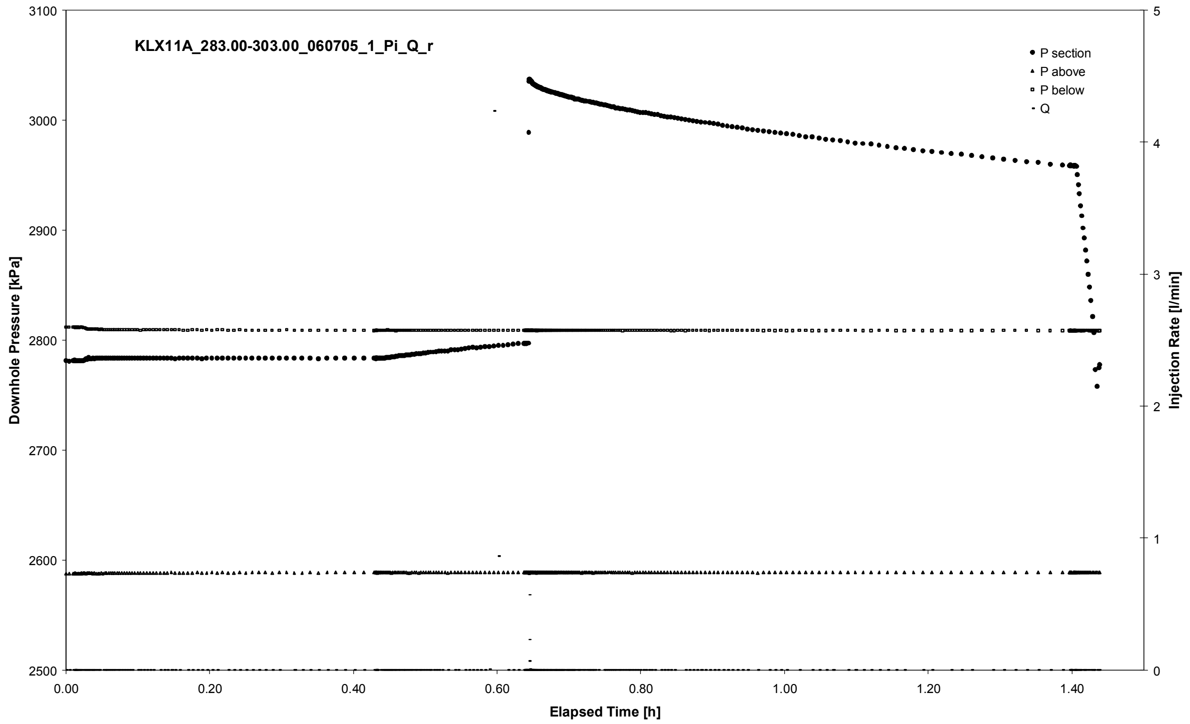


CHIR phase; HORNER match

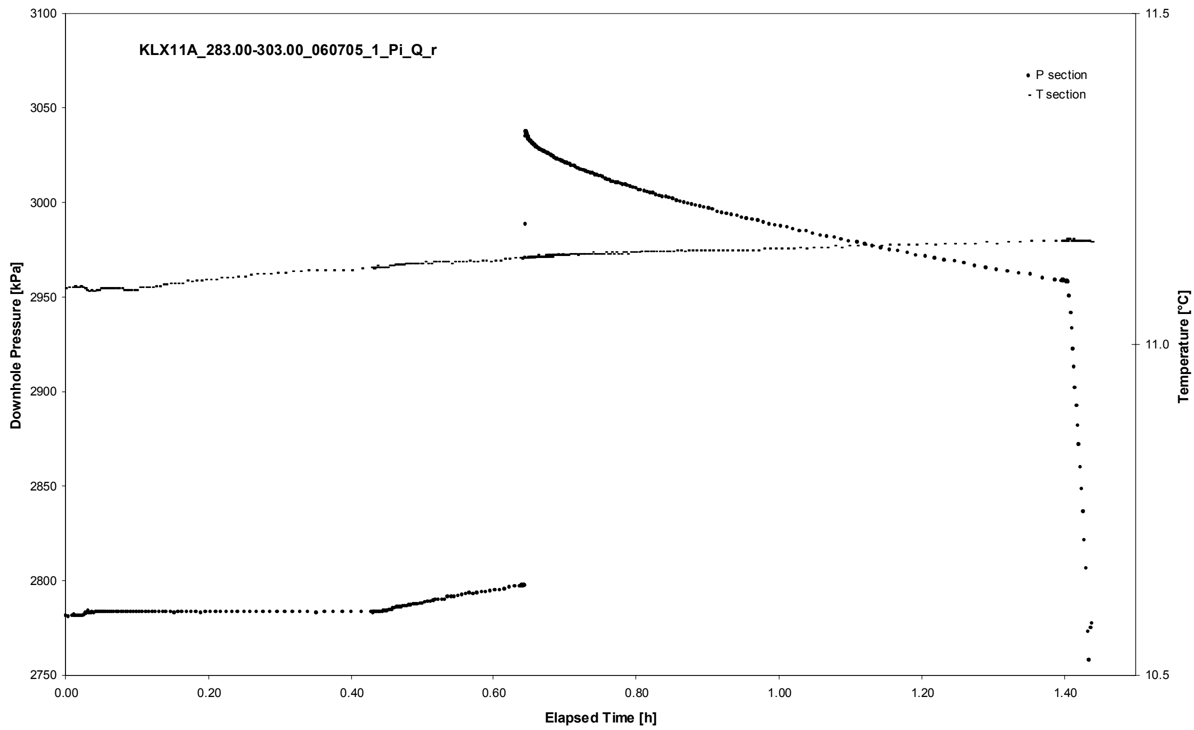
APPENDIX 2-19

Test 283.00 – 303.00 m

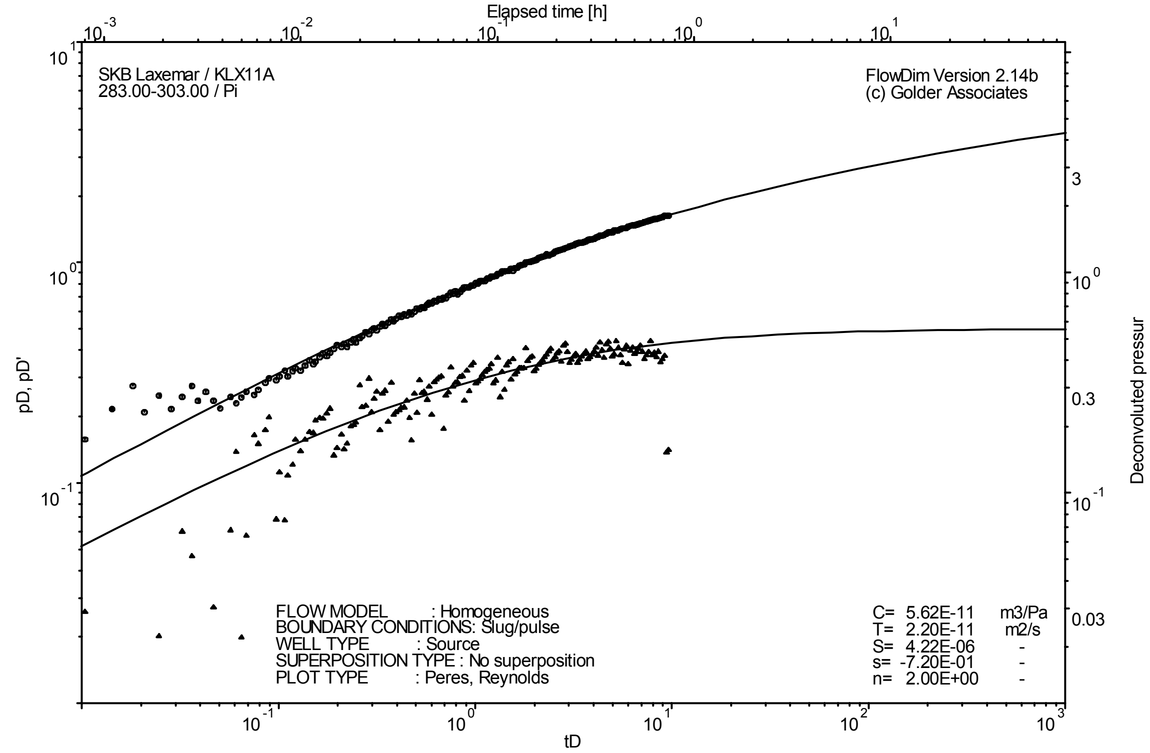
Analysis diagrams



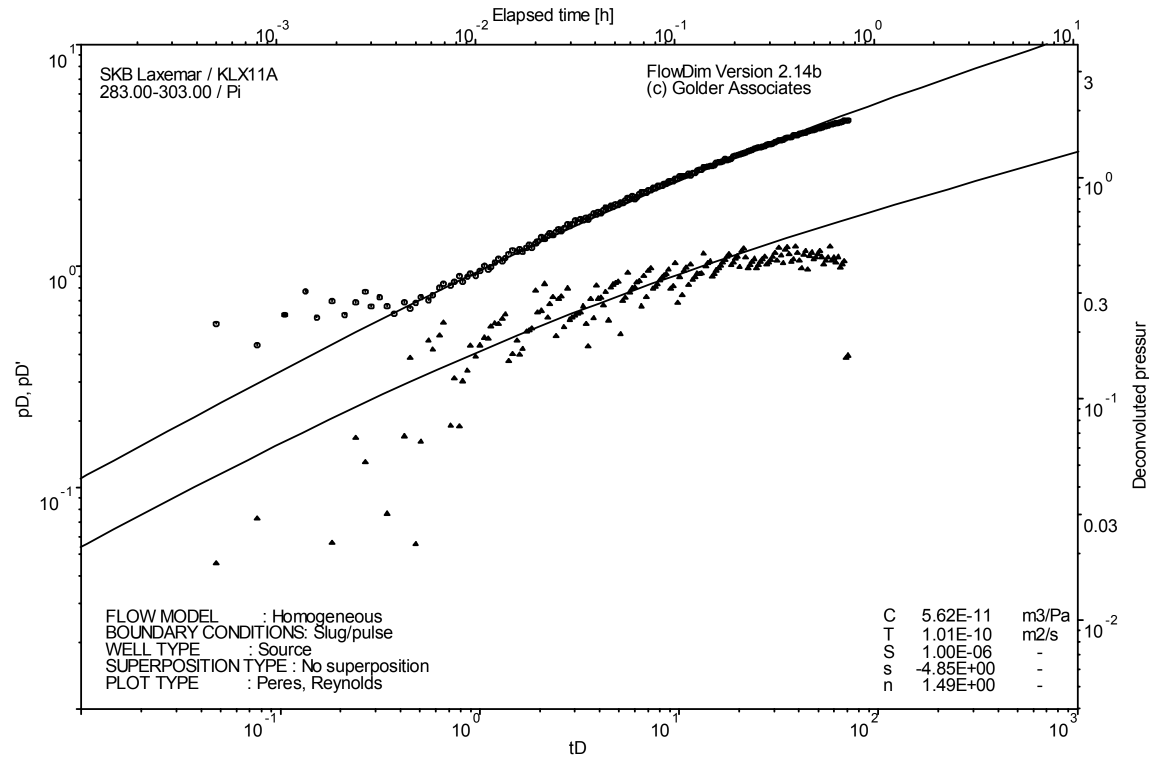
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



Pulse injection; deconvolution match

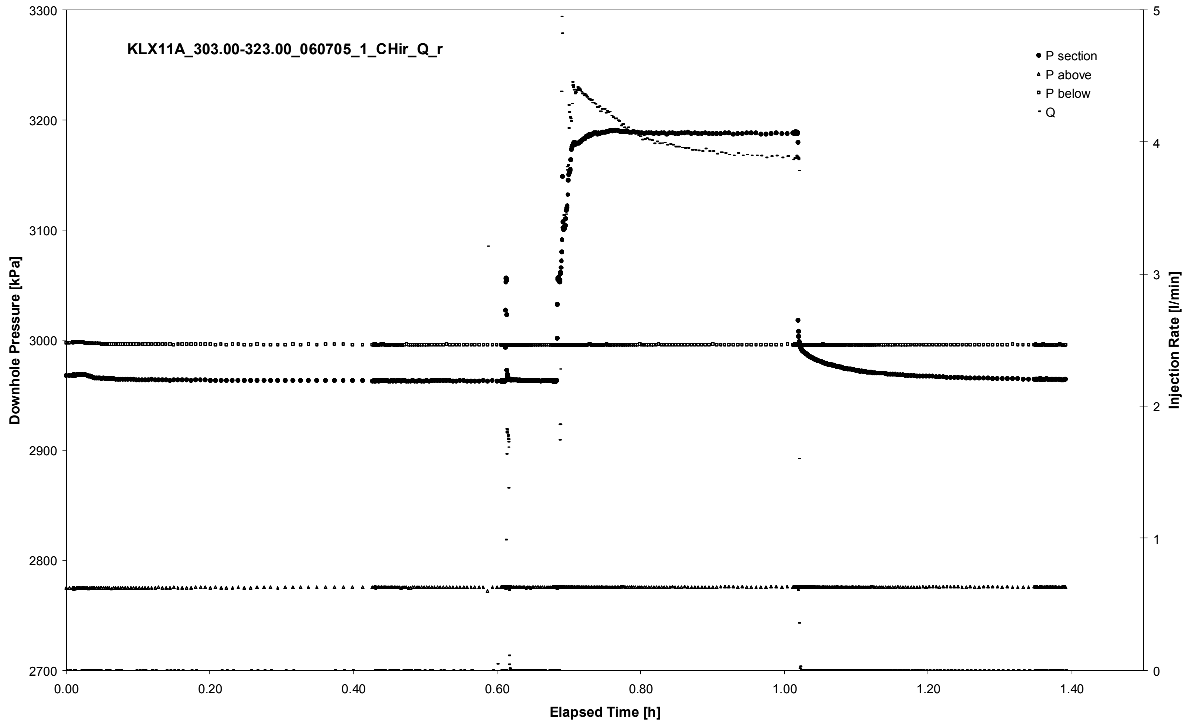


Pulse injection; deconvolution match (n=1.49)

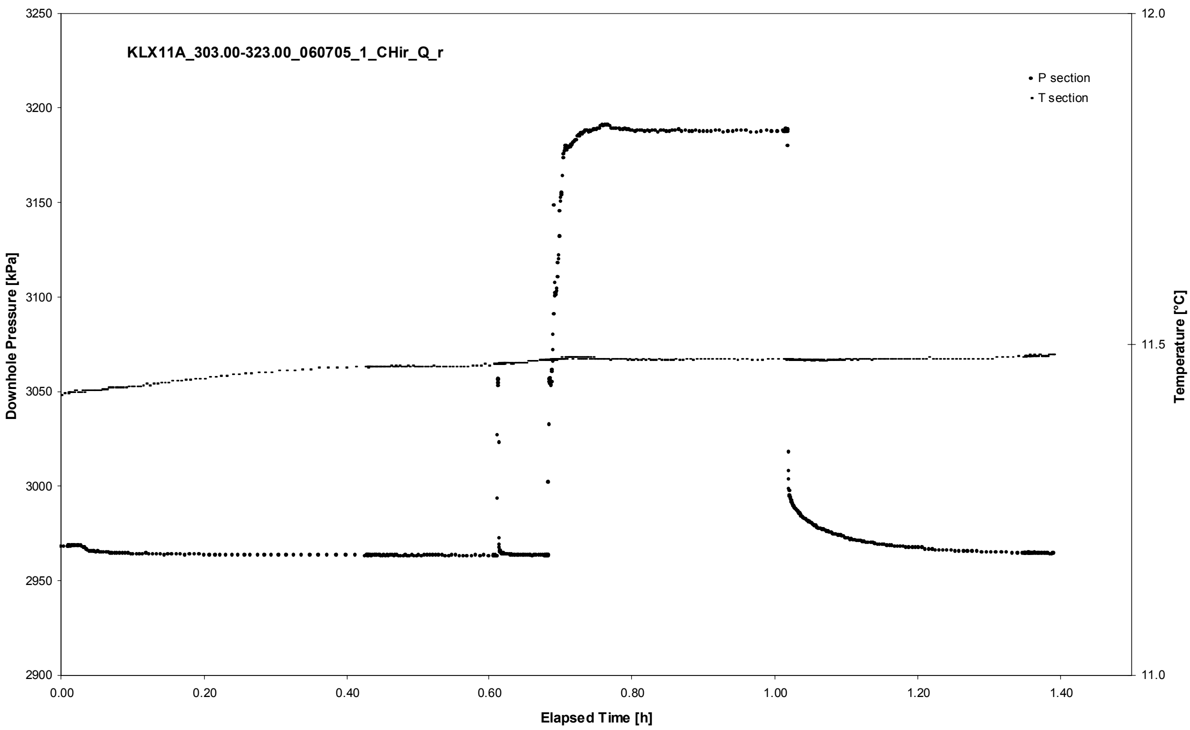
APPENDIX 2-20

Test 303.00 – 323.00 m

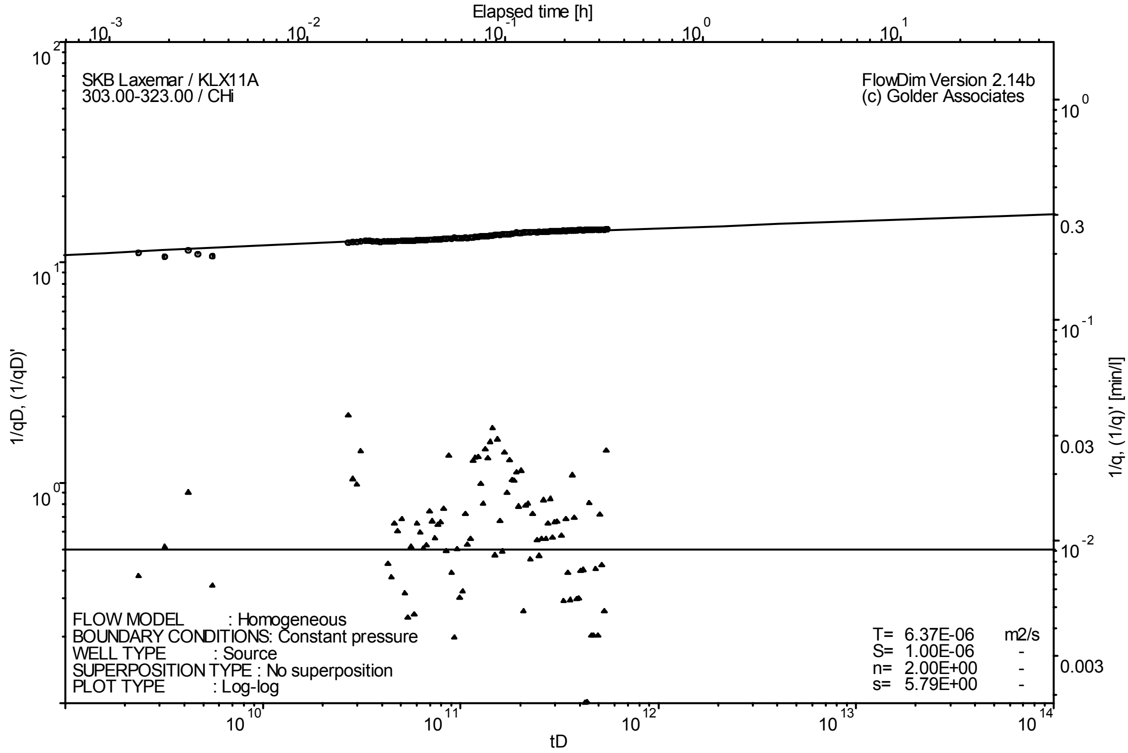
Analysis diagrams



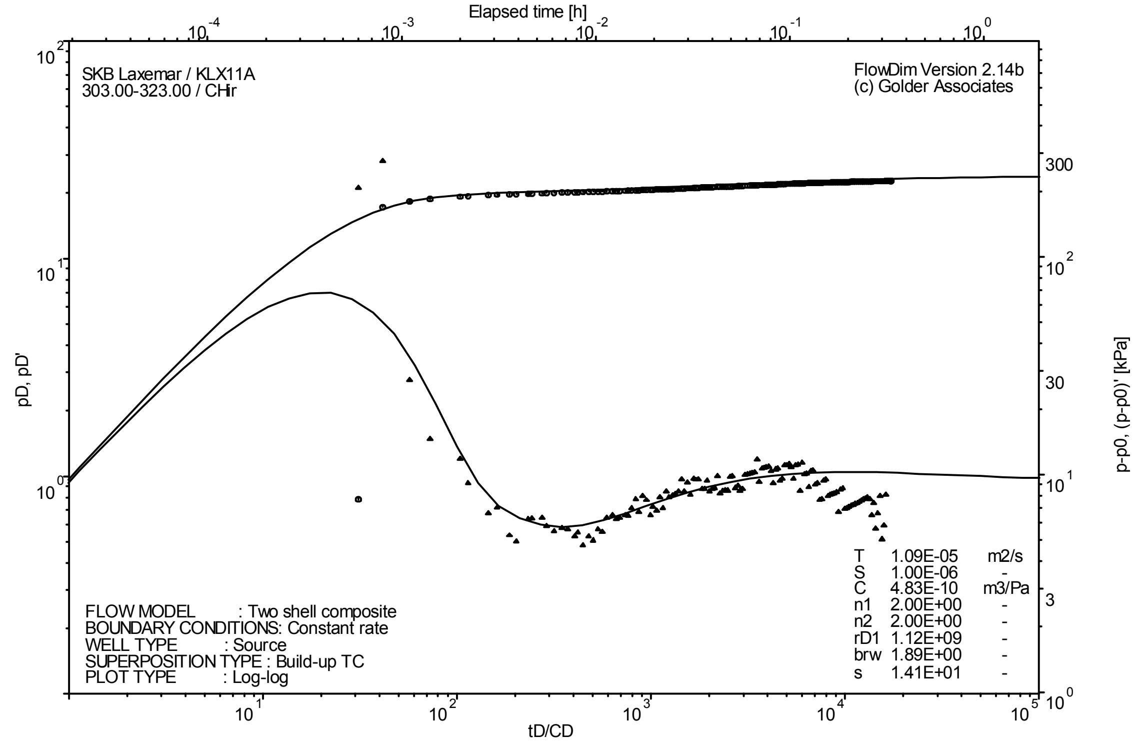
Pressure and flow rate vs. time; cartesian plot



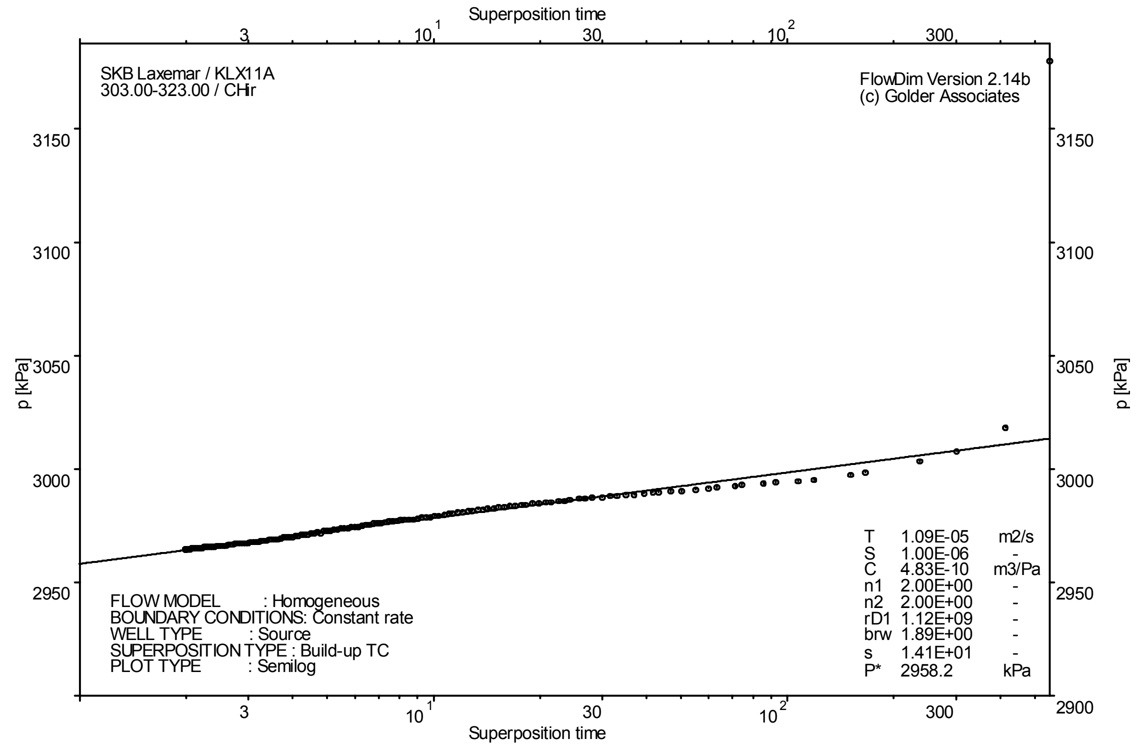
Interval pressure and temperature vs. time; cartesian plot



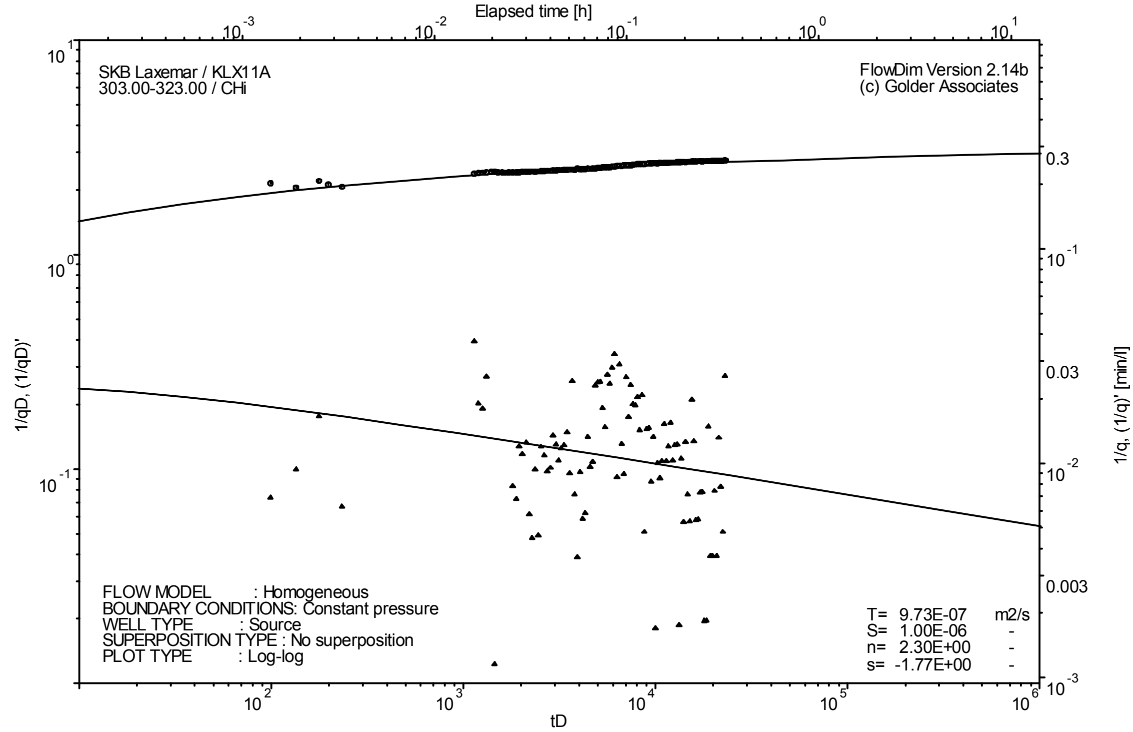
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

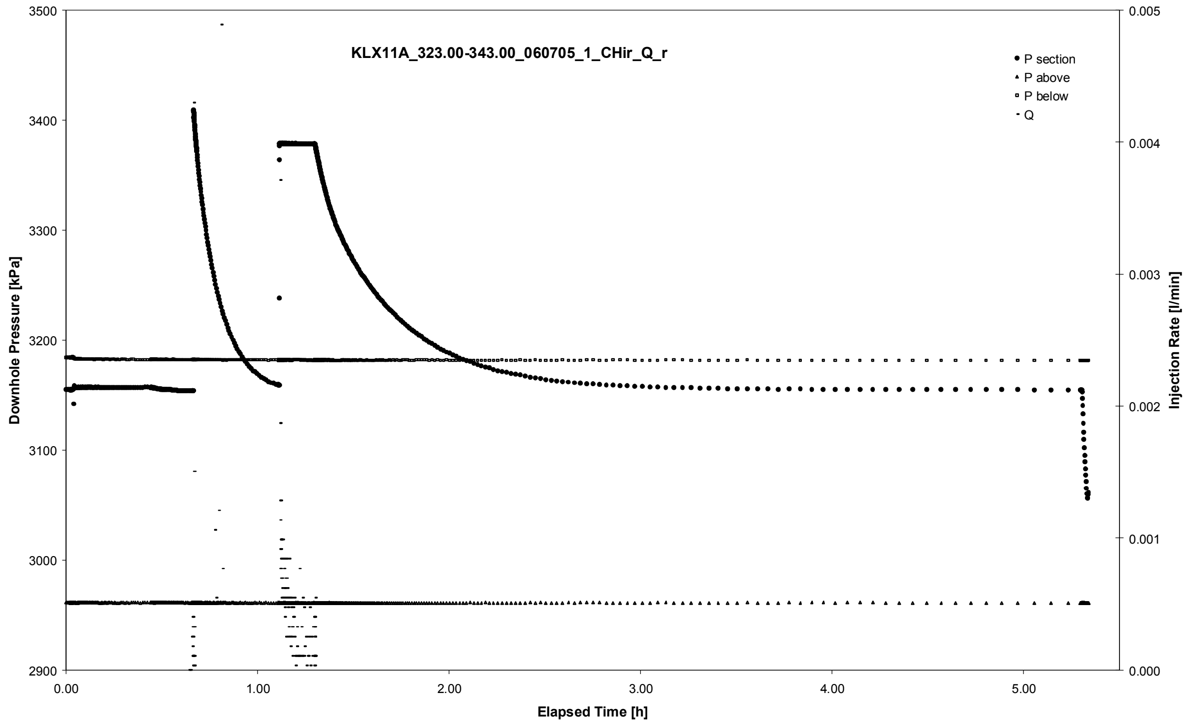


CHI phase; log-log match (n=2.3)

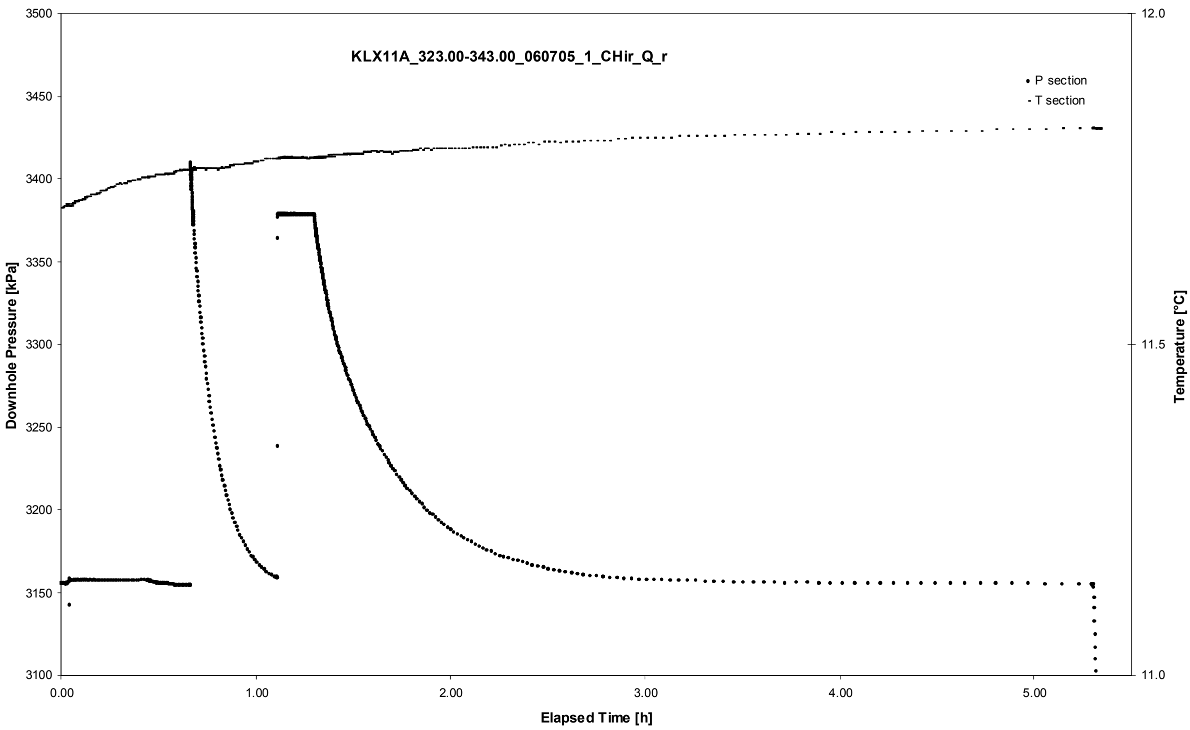
APPENDIX 2-21

Test 323.00 – 343.00 m

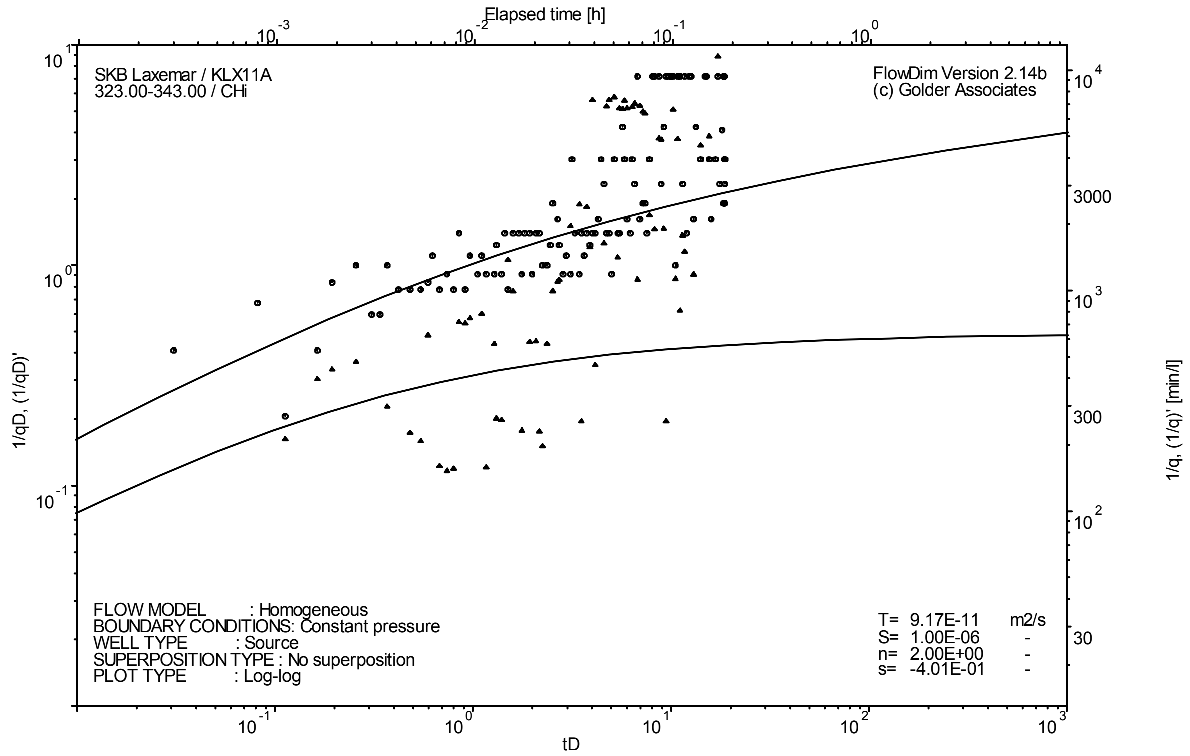
Analysis diagrams



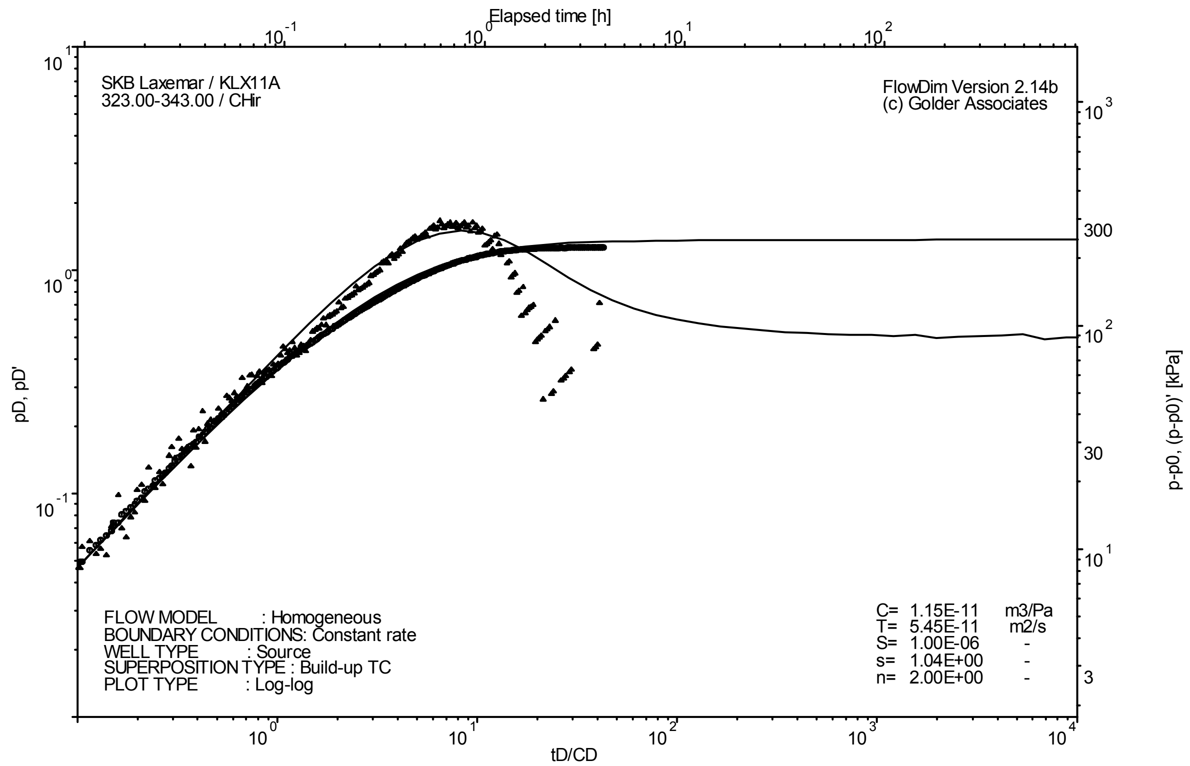
Pressure and flow rate vs. time; cartesian plot



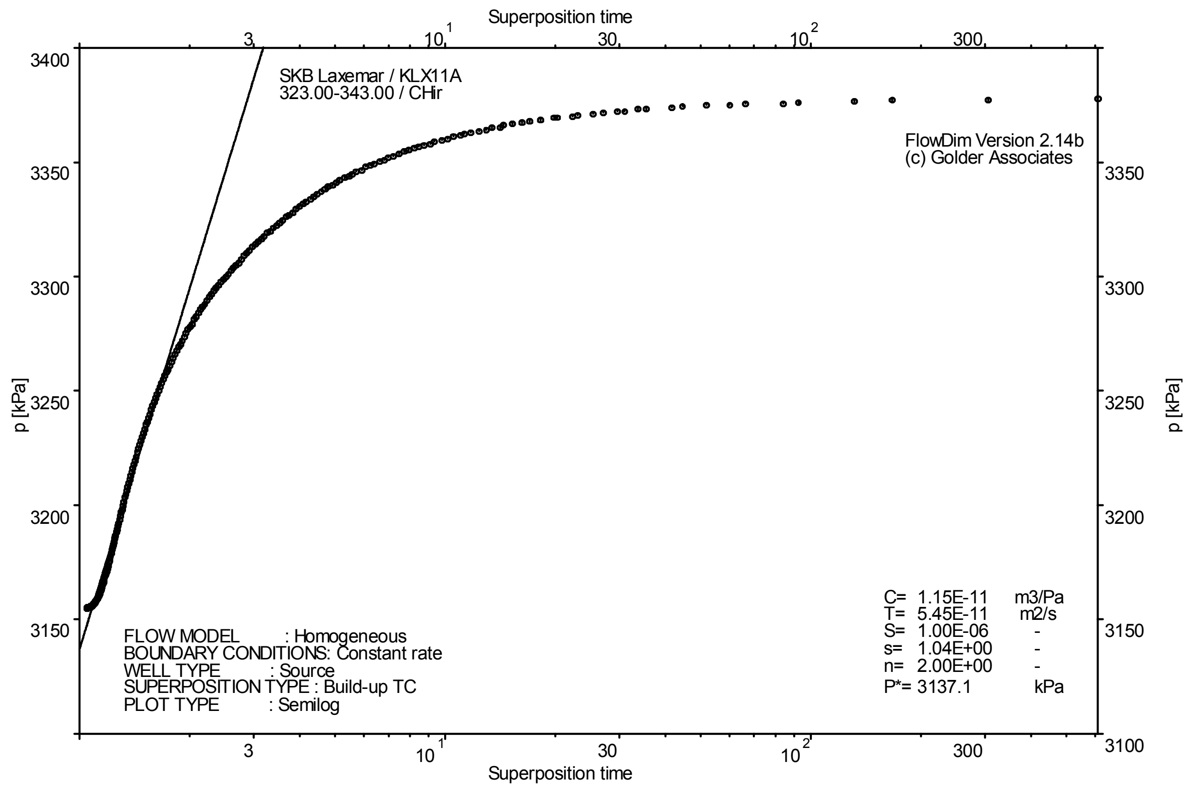
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

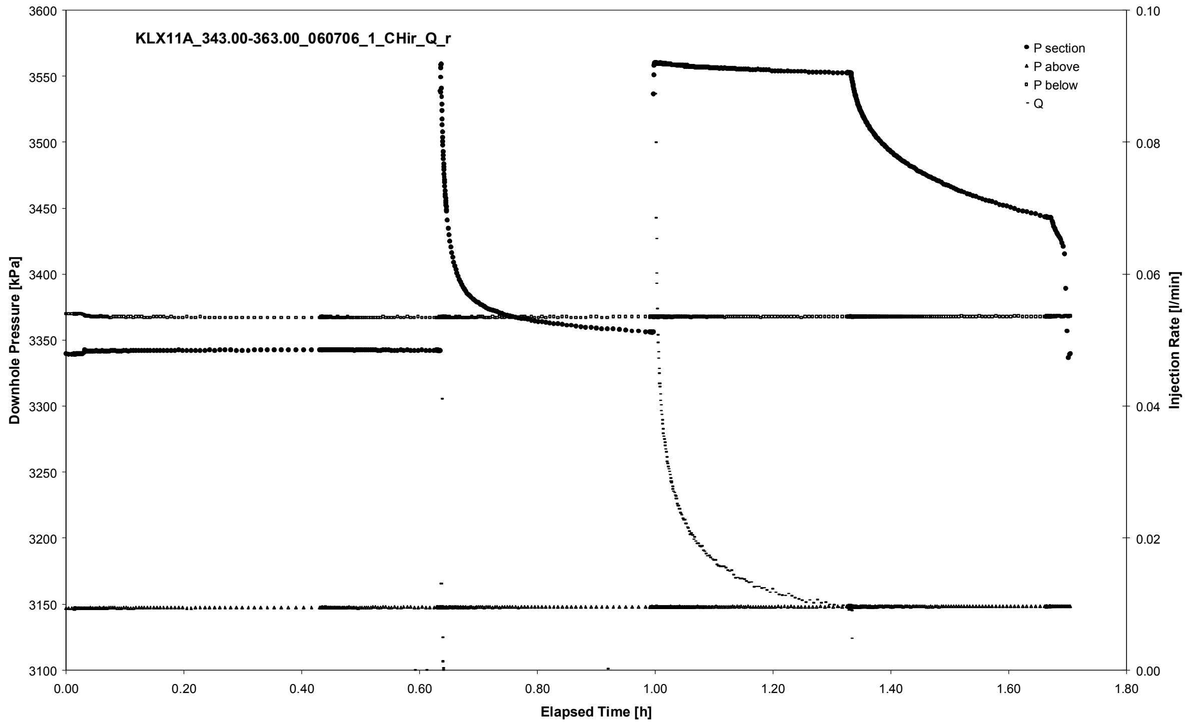


CHIR phase; HORNER match

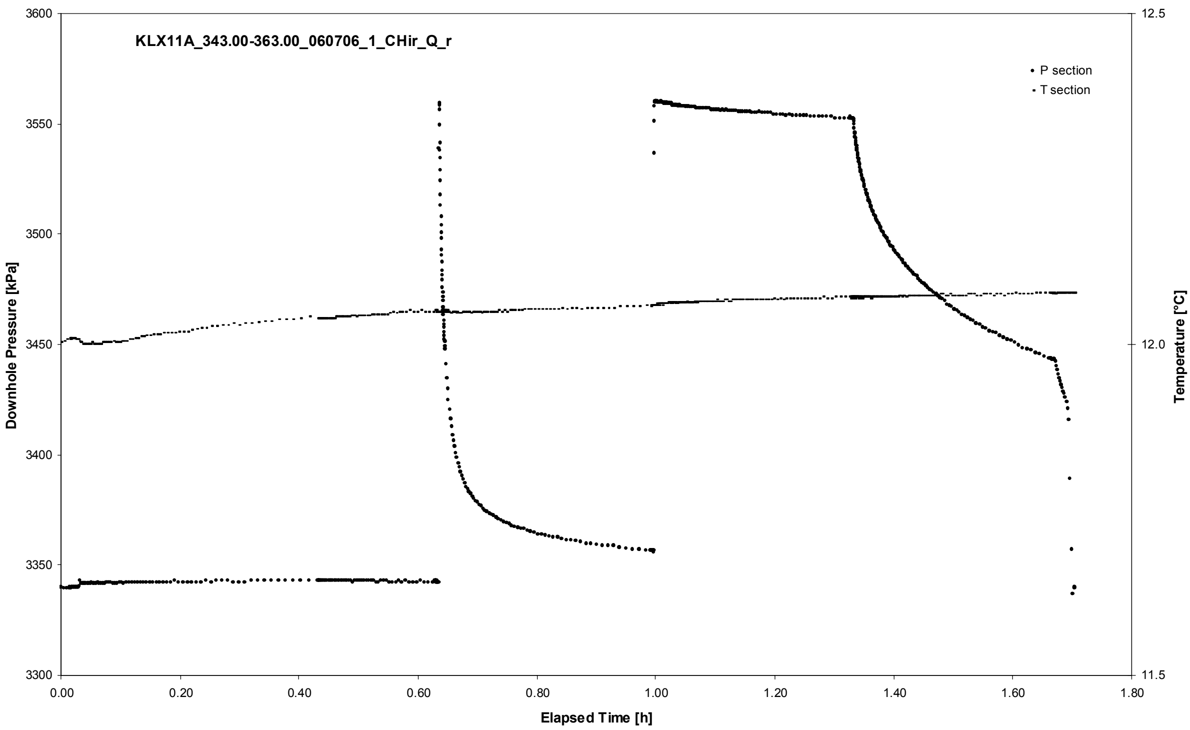
APPENDIX 2-22

Test 343.00 – 363.00 m

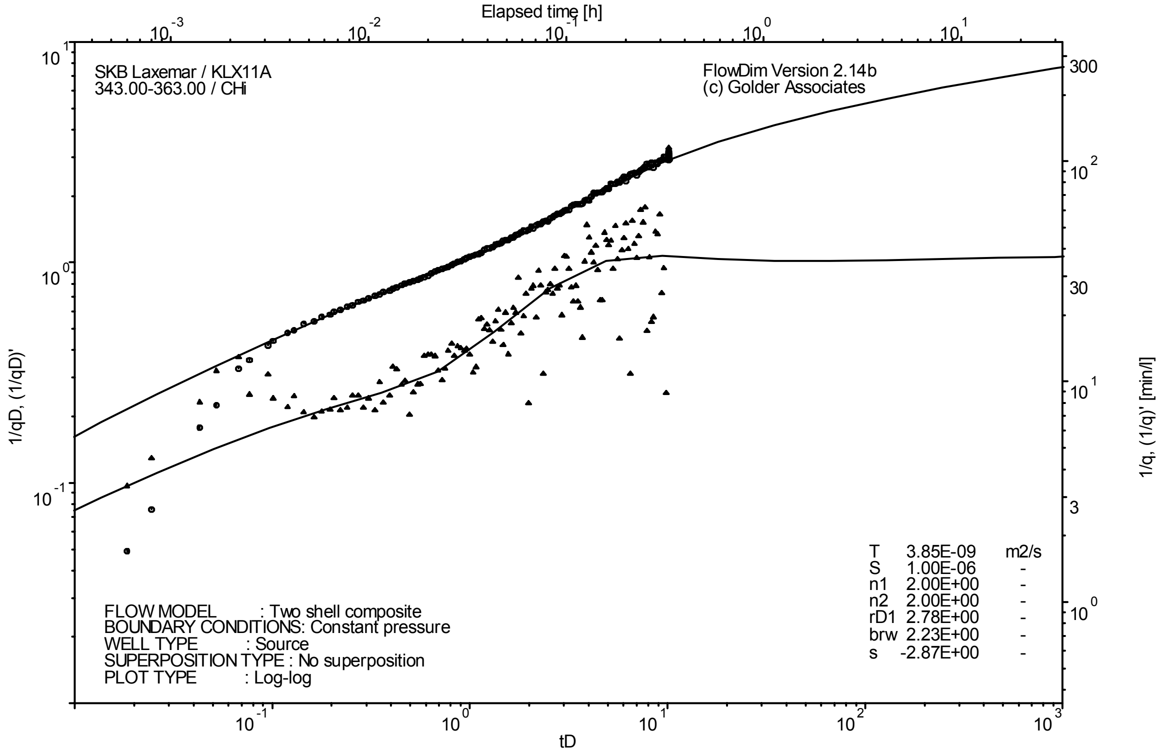
Analysis diagrams



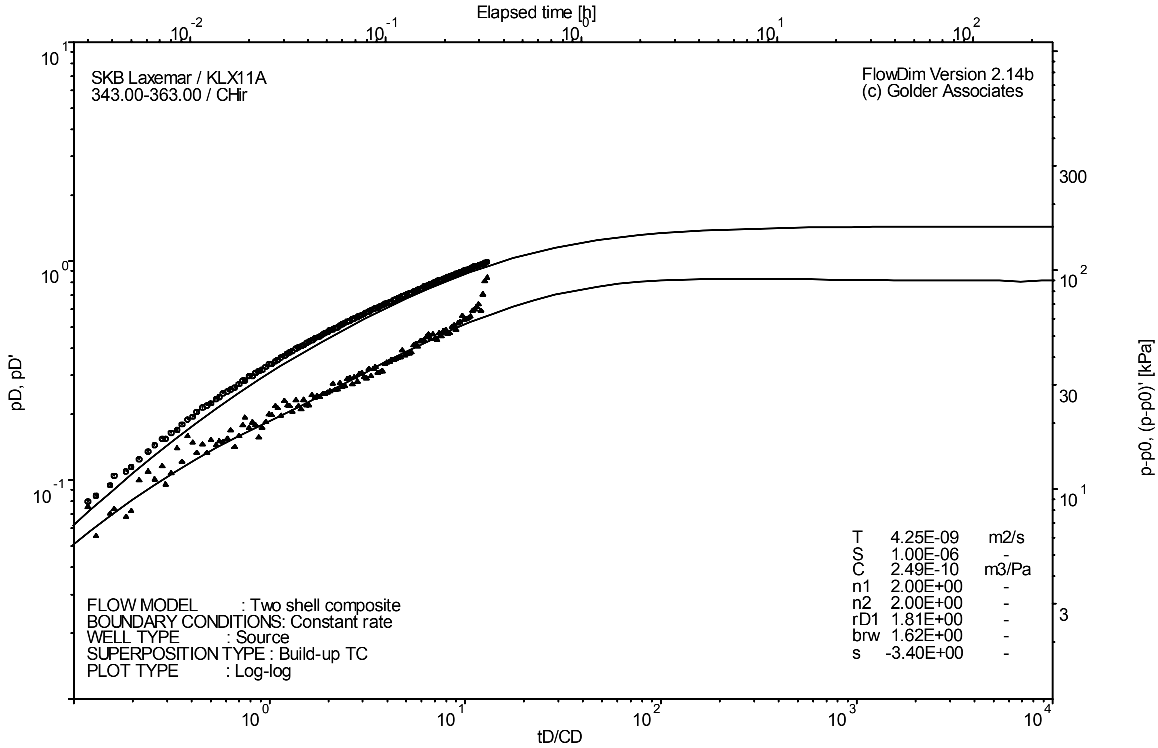
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



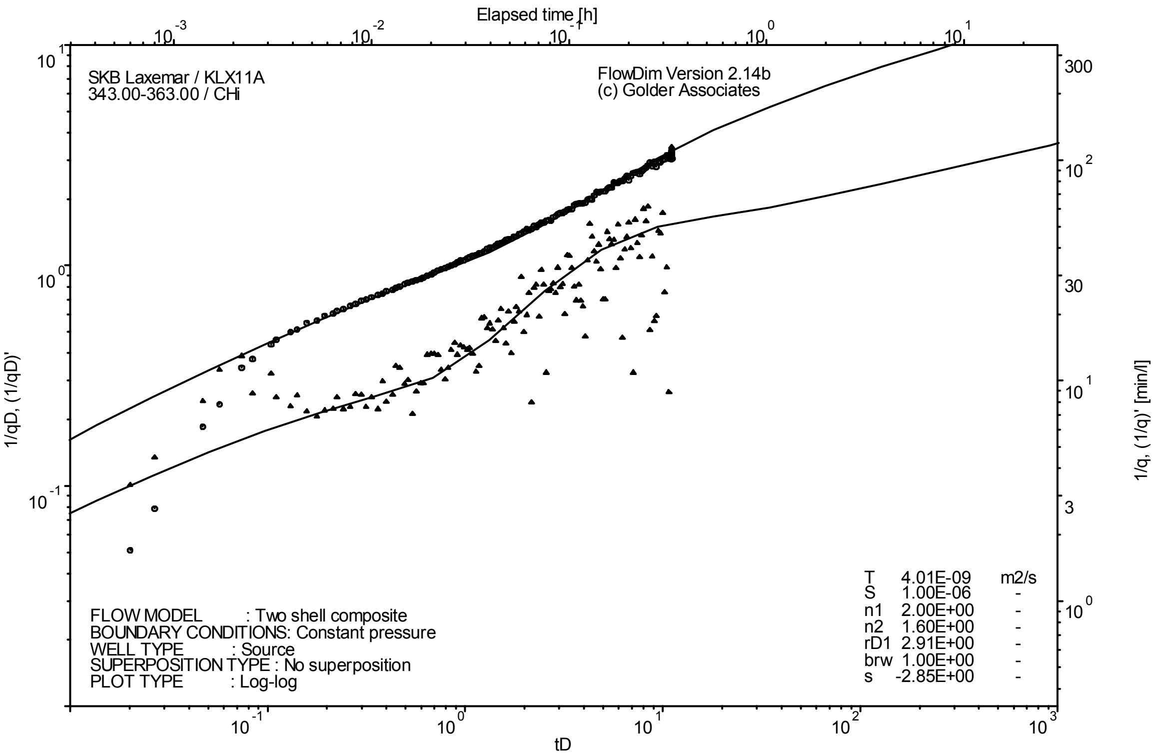
CHI phase; log-log match



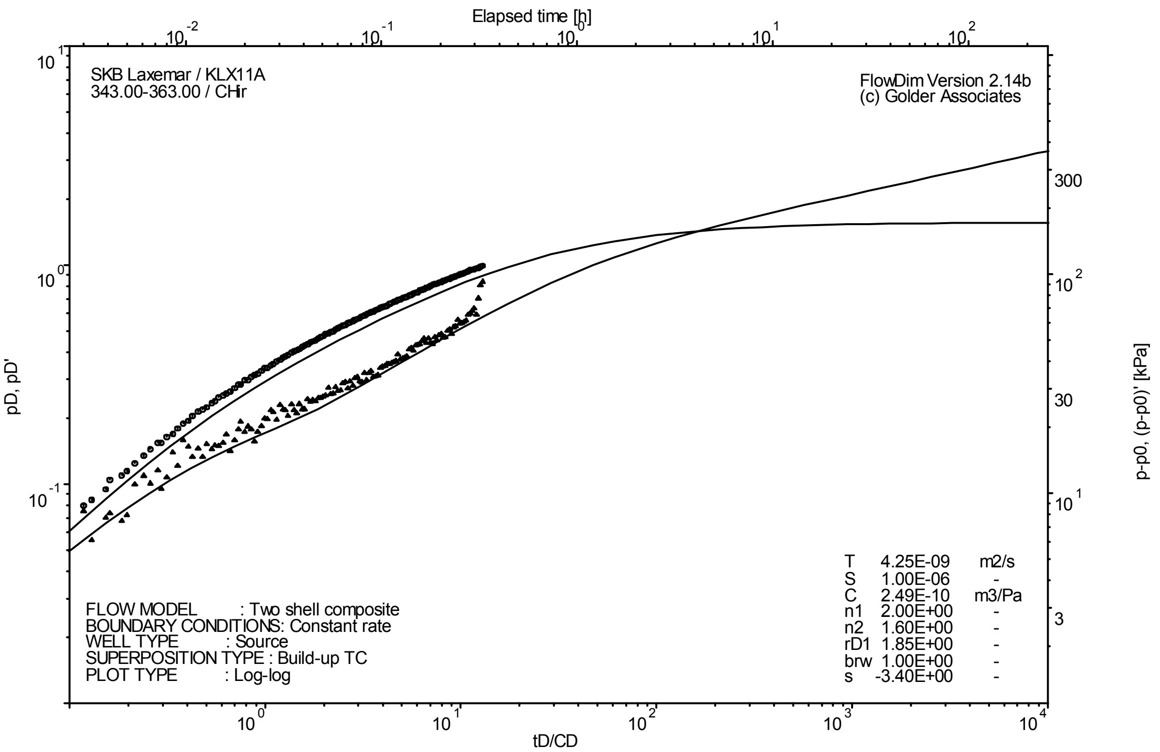
CHIR phase; log-log match

Not analysable

CHIR phase; HORNER match



CHI phase; log-log match (n1=2, n2=1.6)

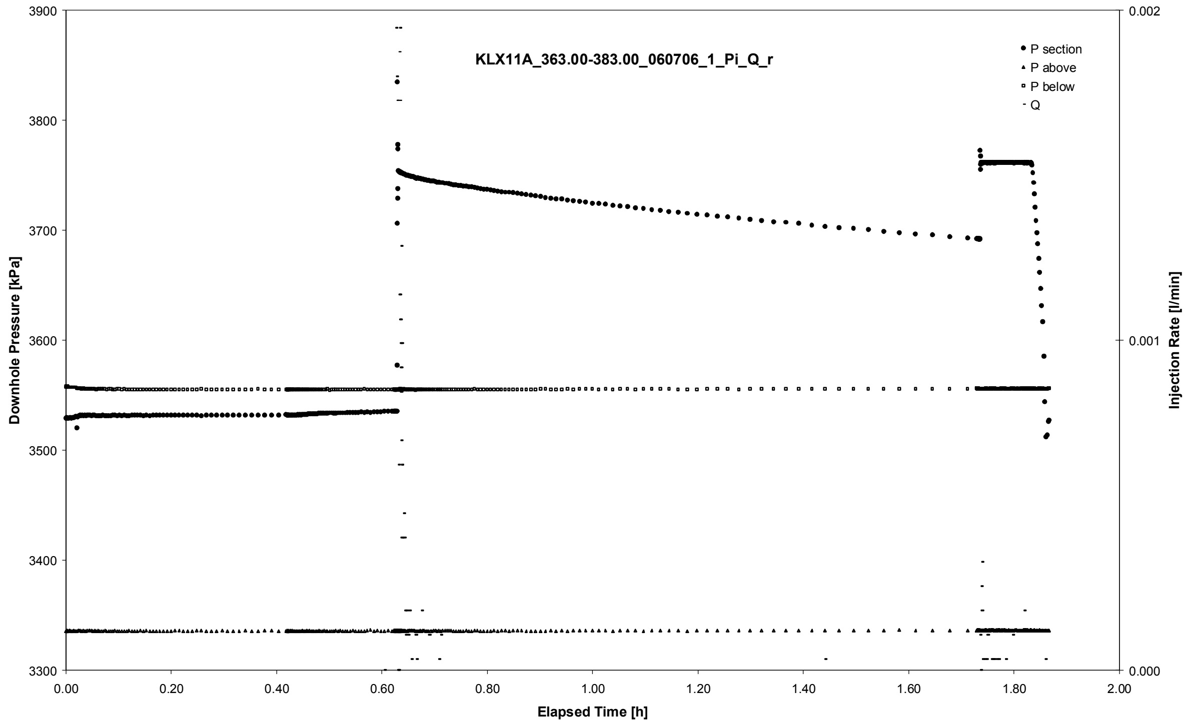


CHIR phase; log-log match (n1=2, n2=1.6)

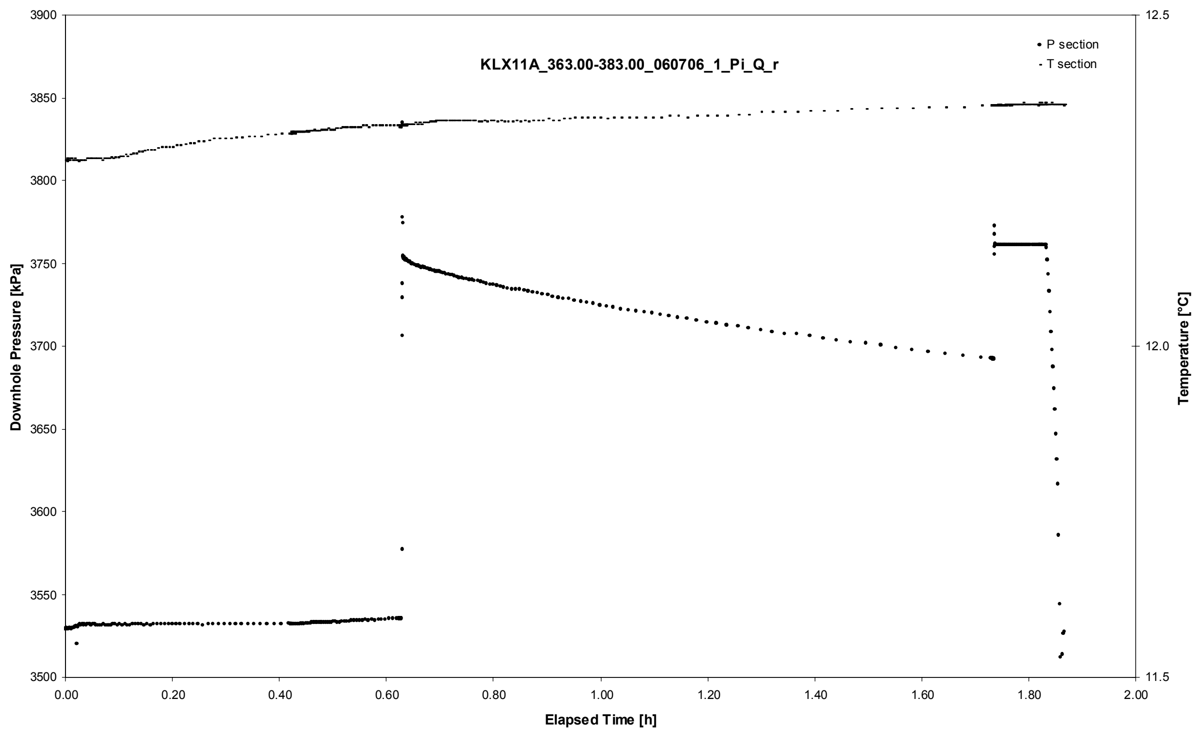
APPENDIX 2-23

Test 363.00 – 383.00 m

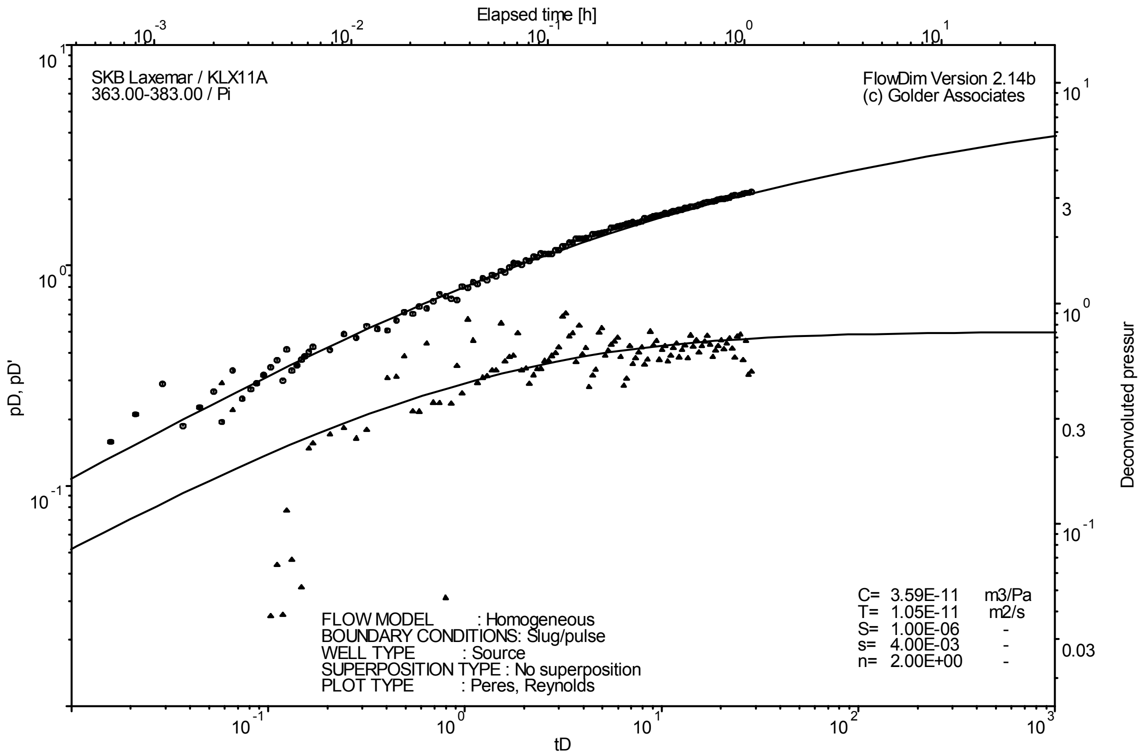
Analysis diagrams



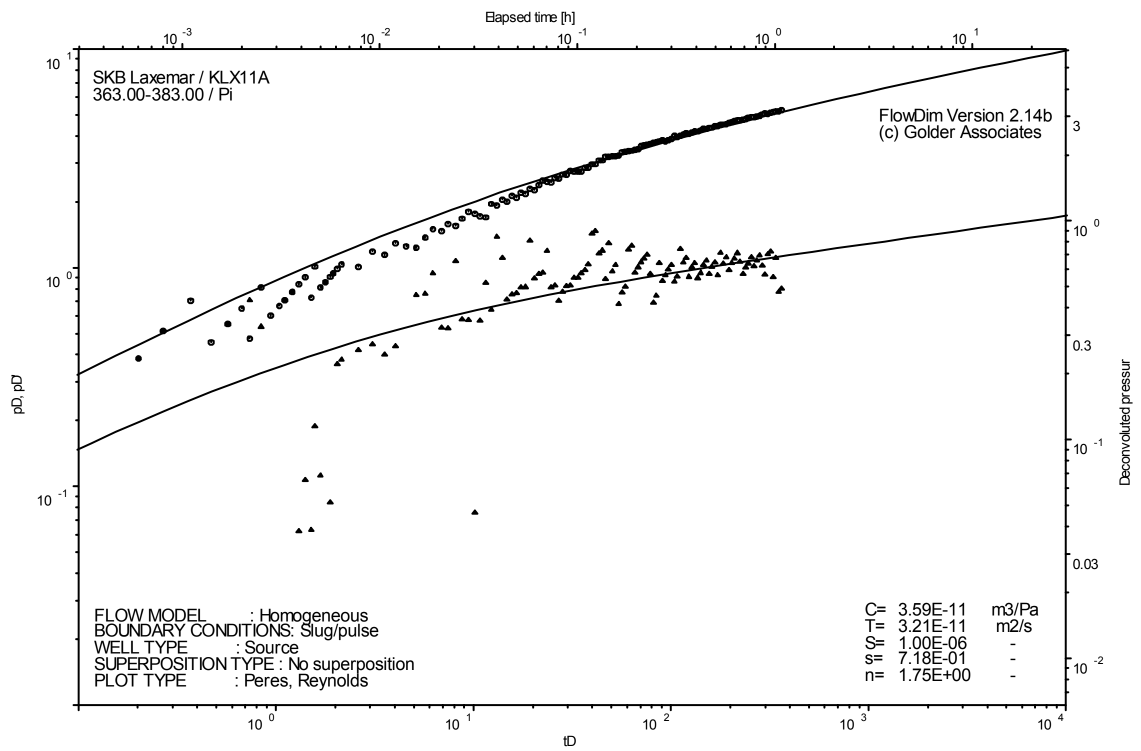
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



Pulse injection; deconvolution match

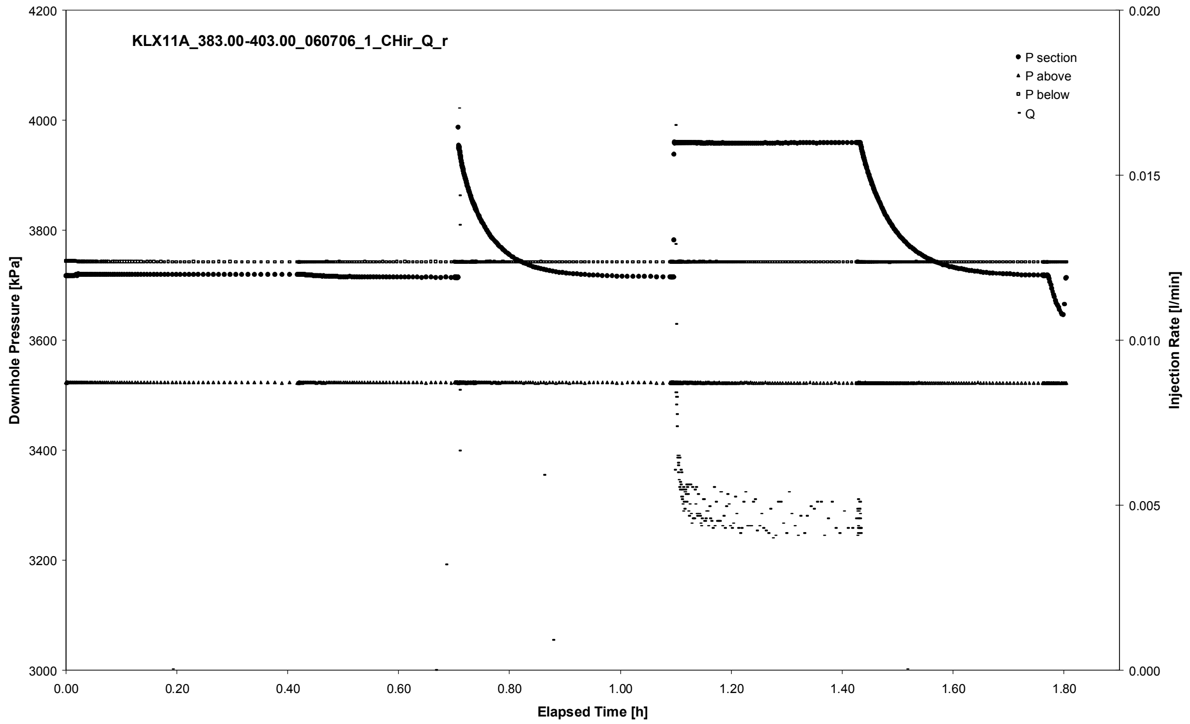


Pulse injection; deconvolution match (n=1.75)

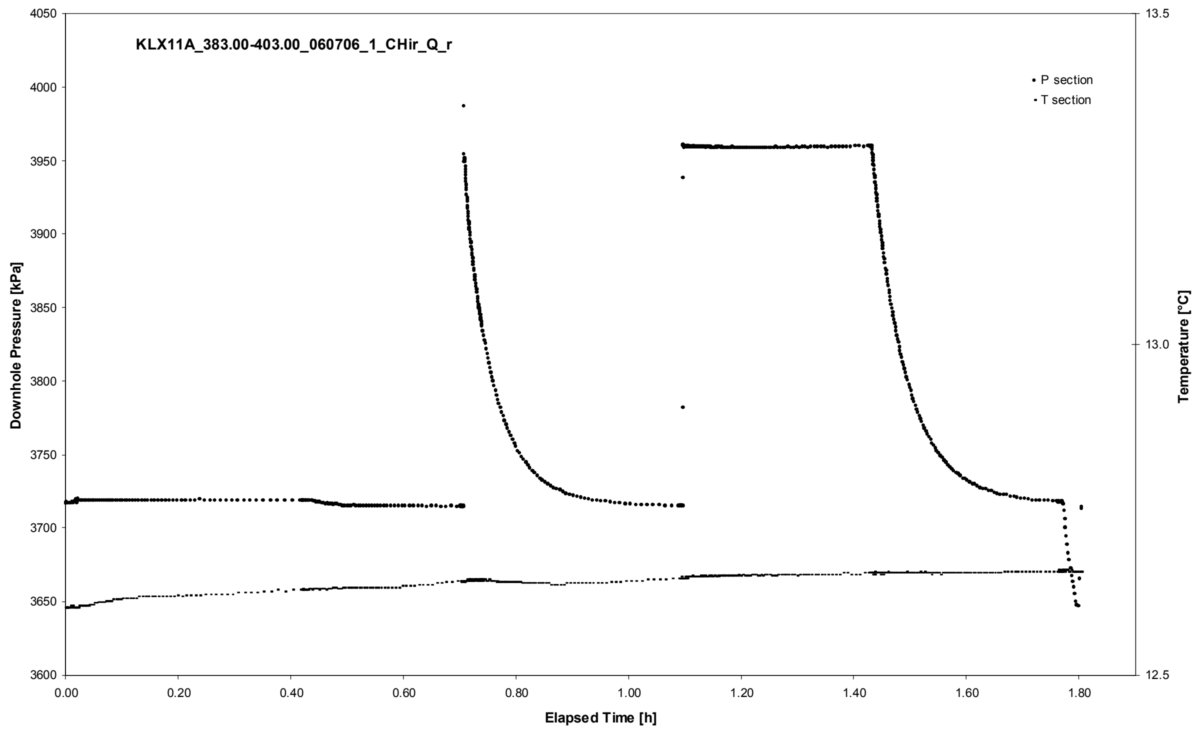
APPENDIX 2-24

Test 383.00 – 403.00 m

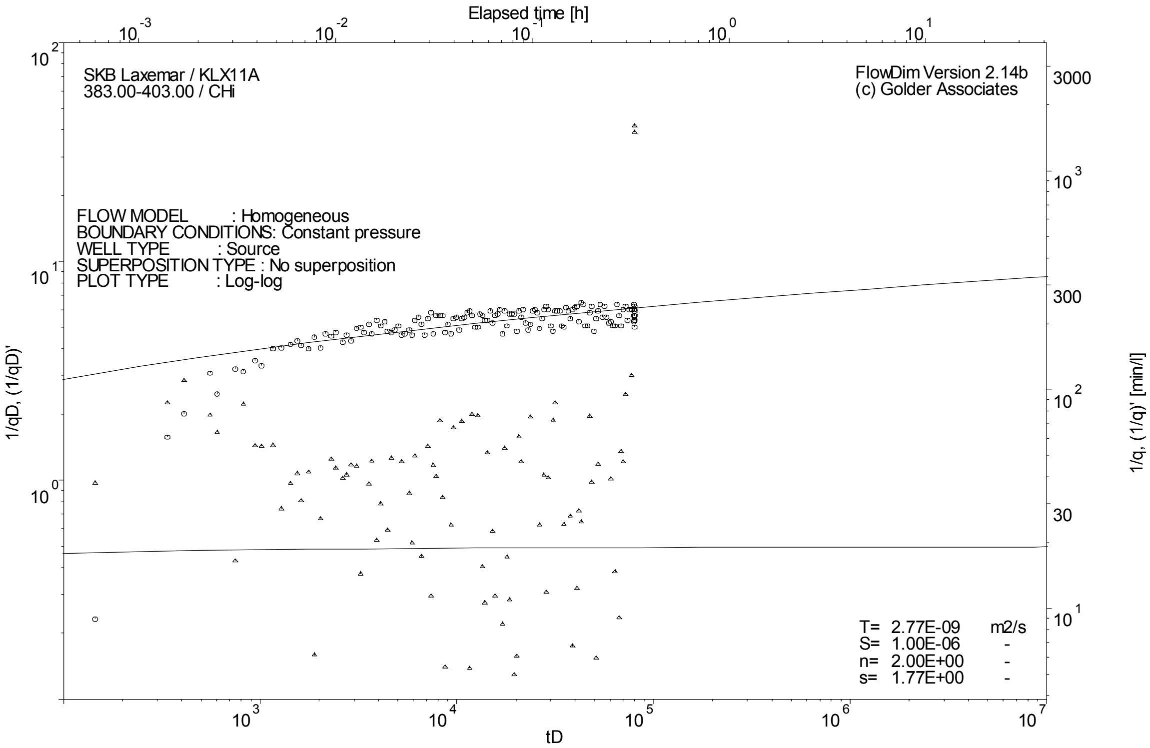
Analysis diagrams



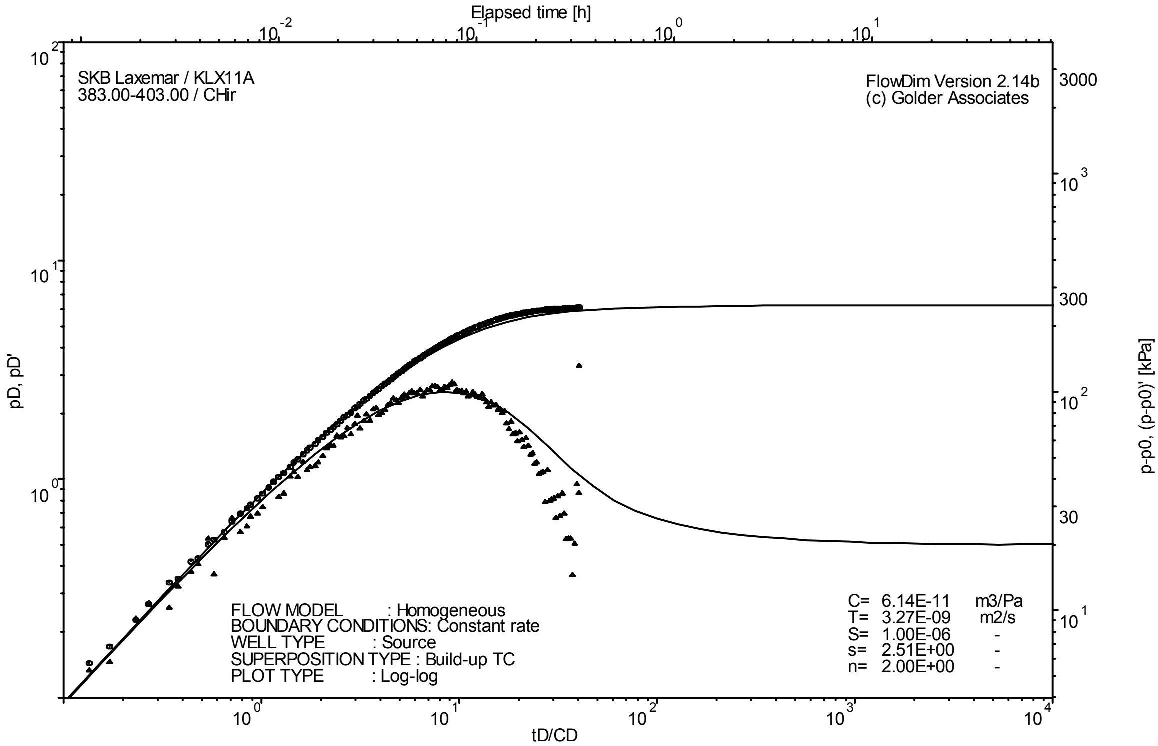
Pressure and flow rate vs. time; cartesian plot



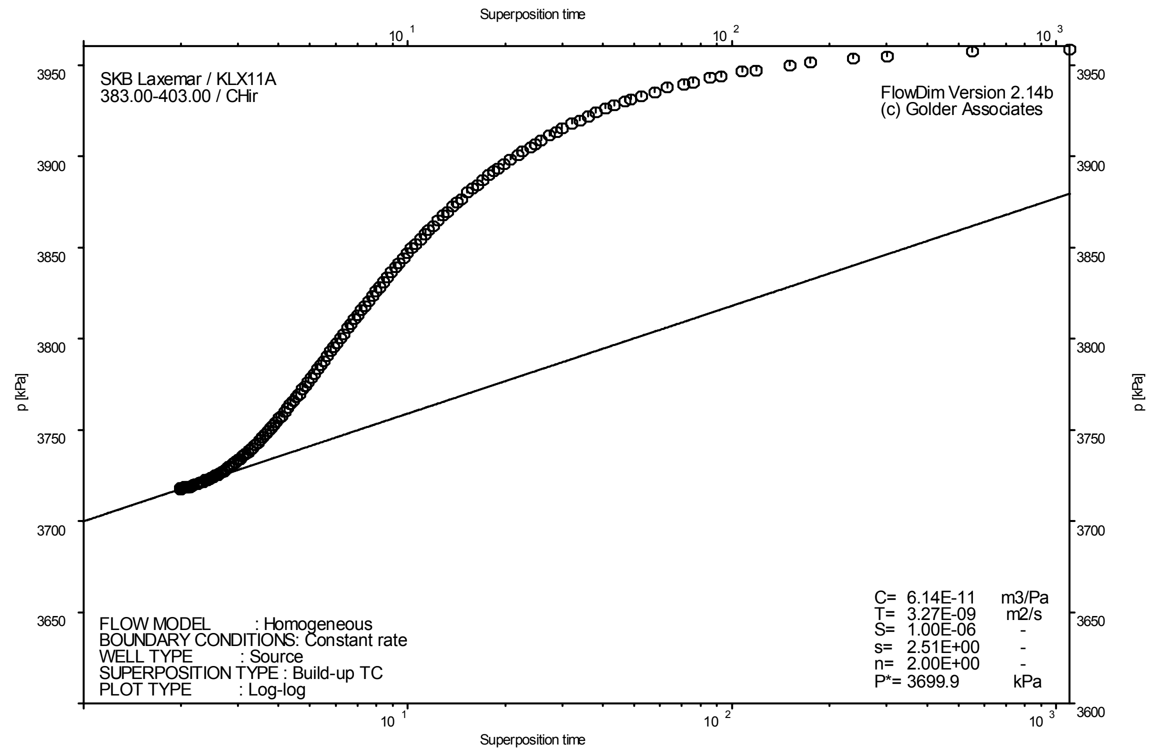
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

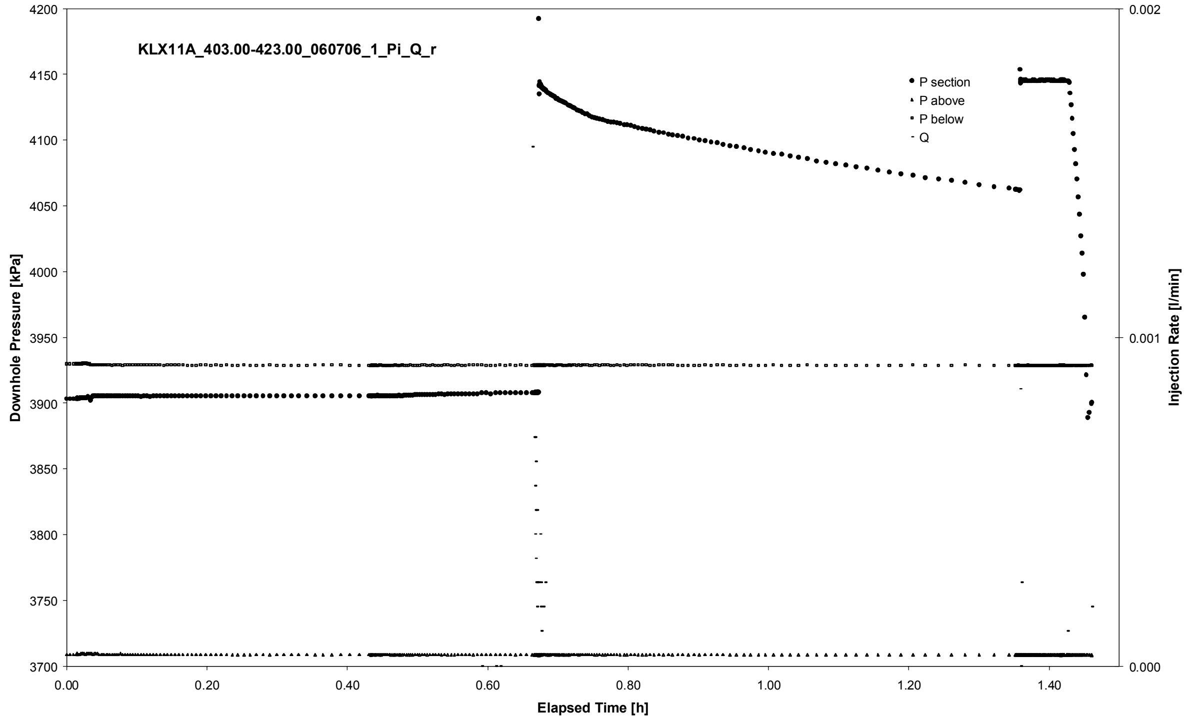


CHIR phase; HORNER match

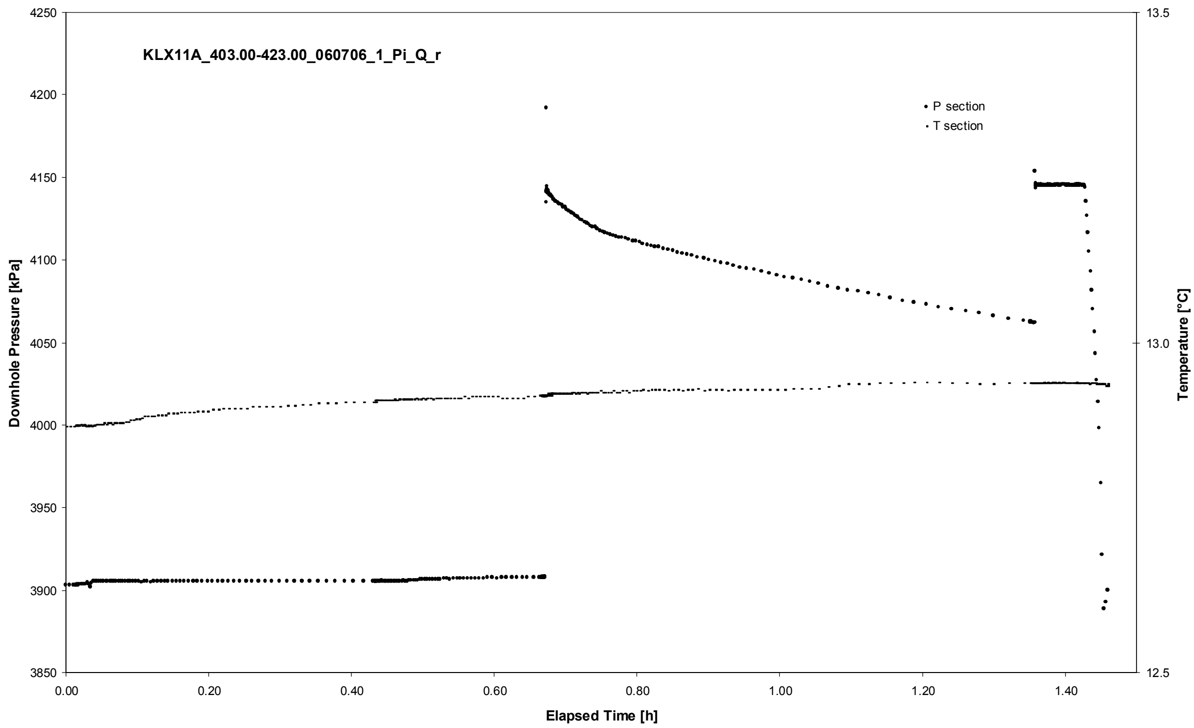
APPENDIX 2-25

Test 403.00 – 423.00 m

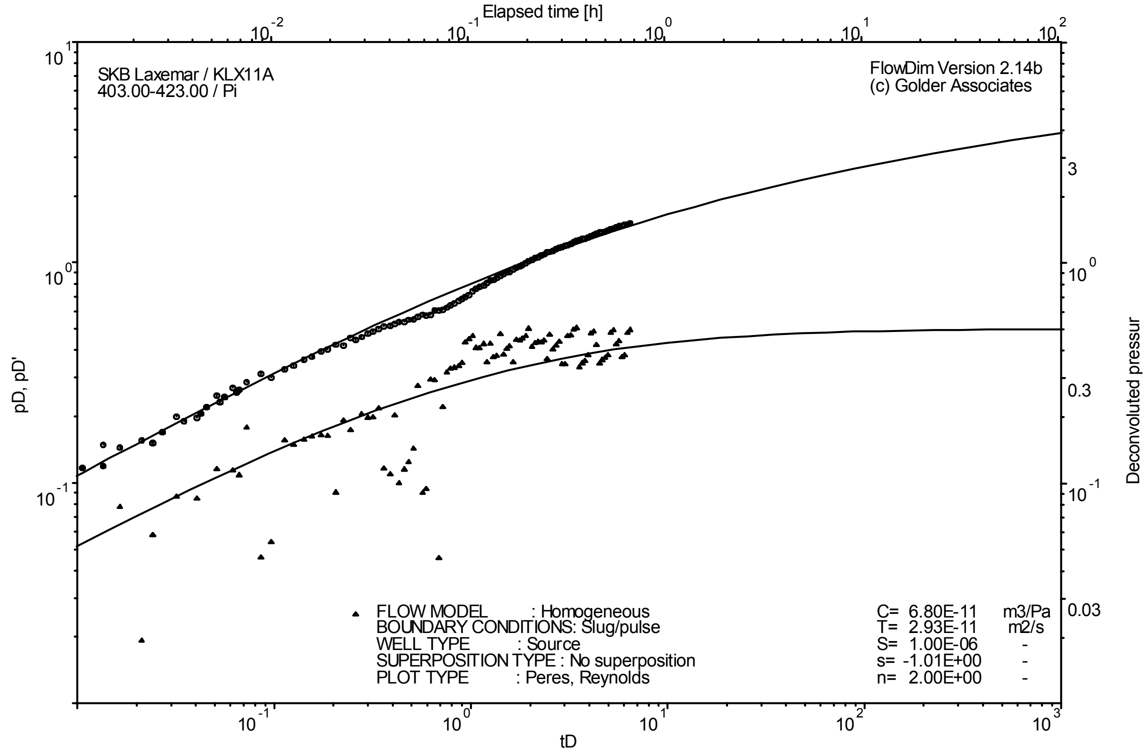
Analysis diagrams



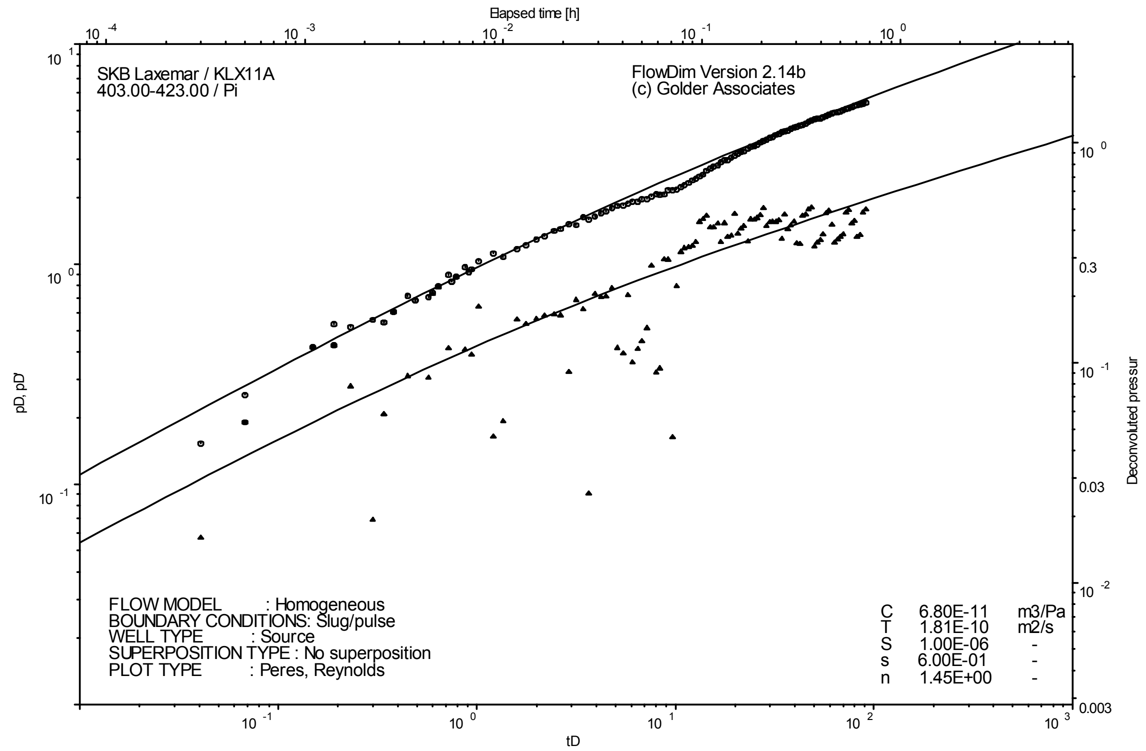
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



Pulse injection; deconvolution match

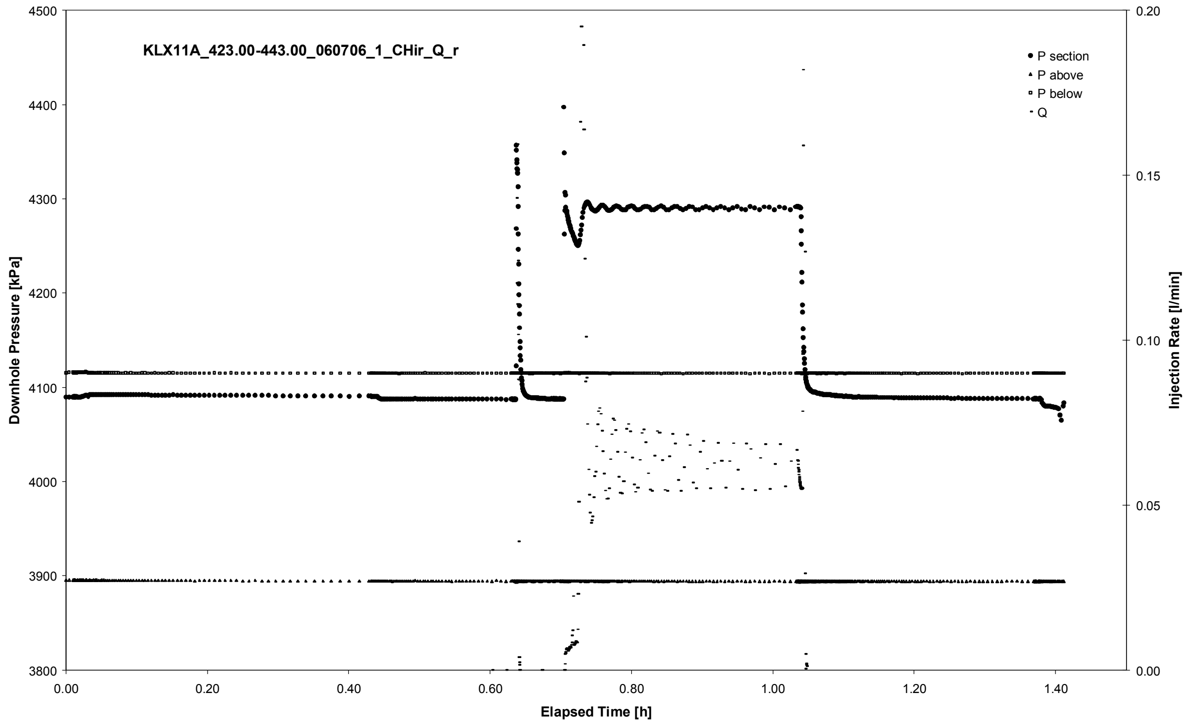


Pulse injection; deconvolution match (n=1.45)

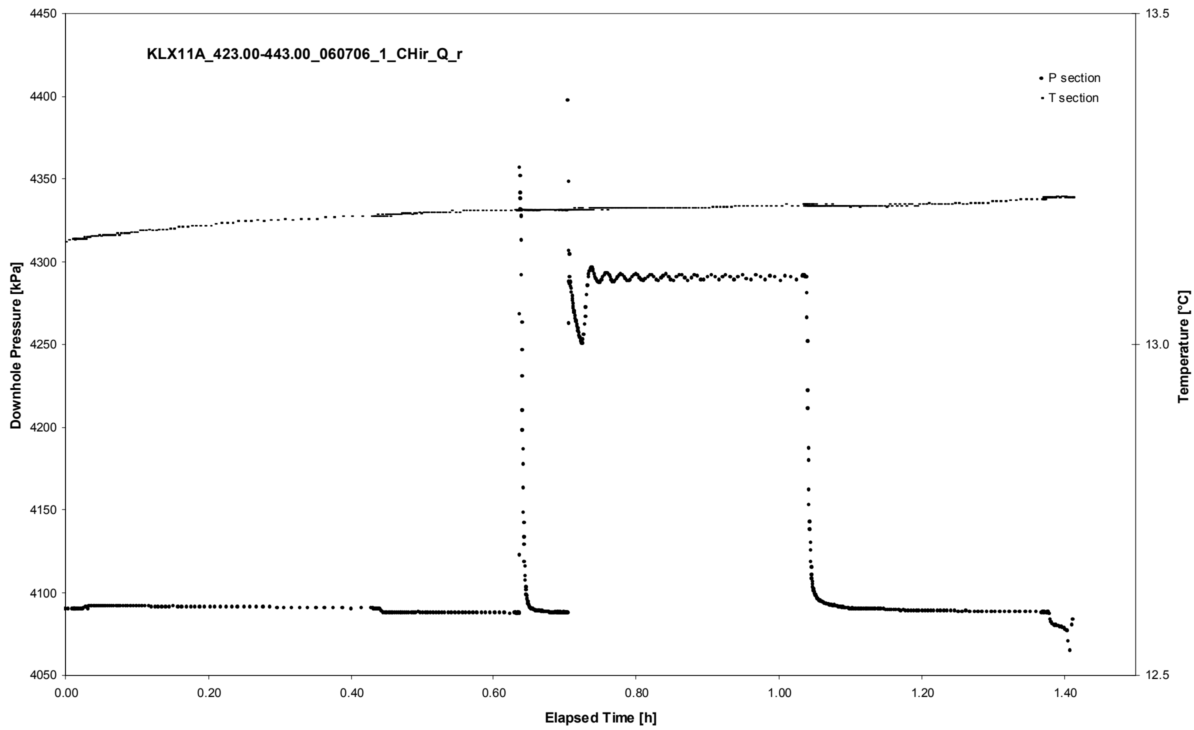
APPENDIX 2-26

Test 423.00 – 443.00 m

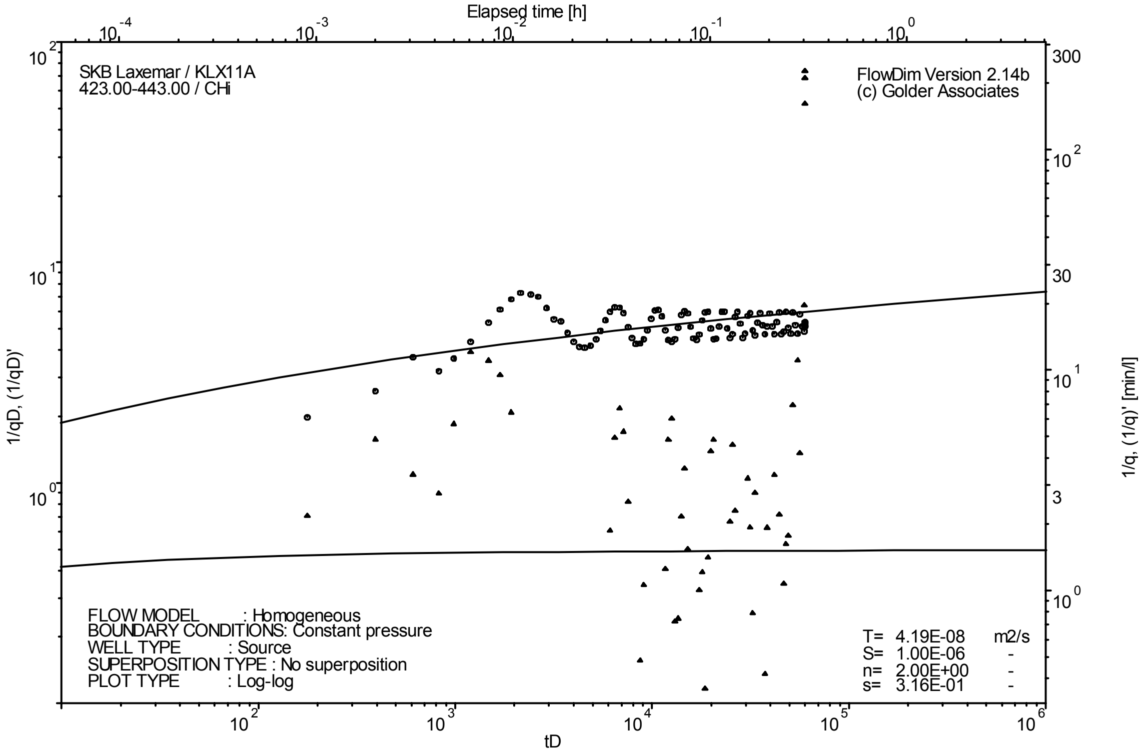
Analysis diagrams



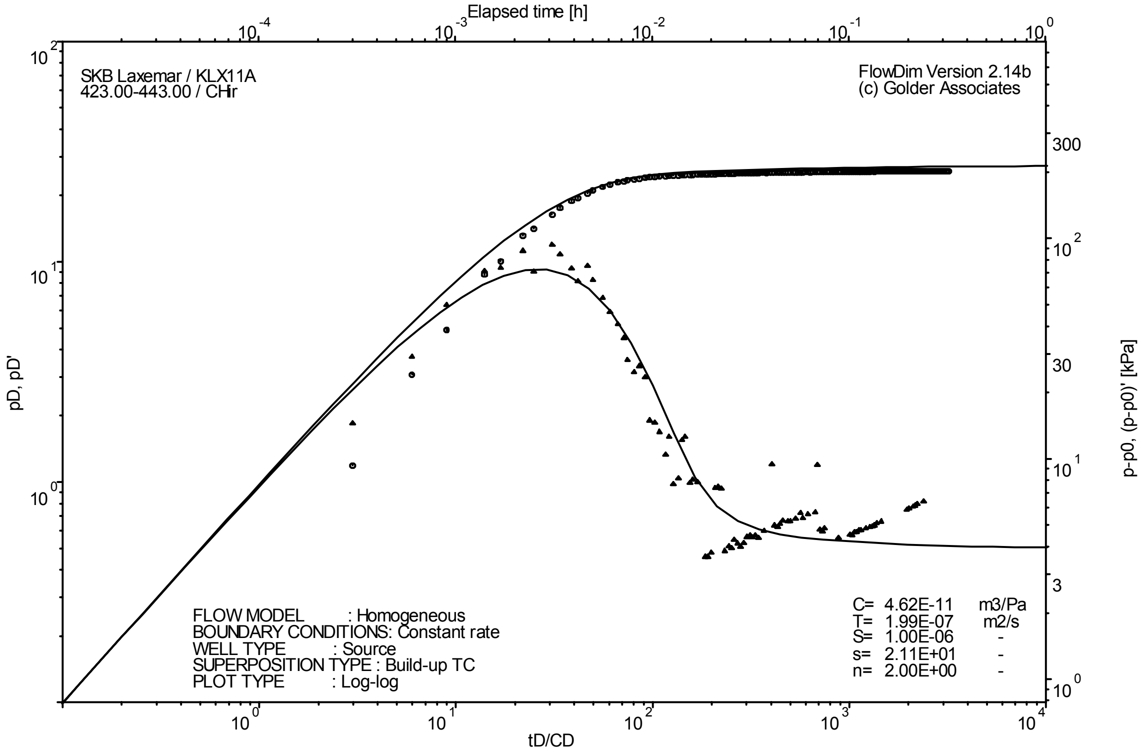
Pressure and flow rate vs. time; cartesian plot



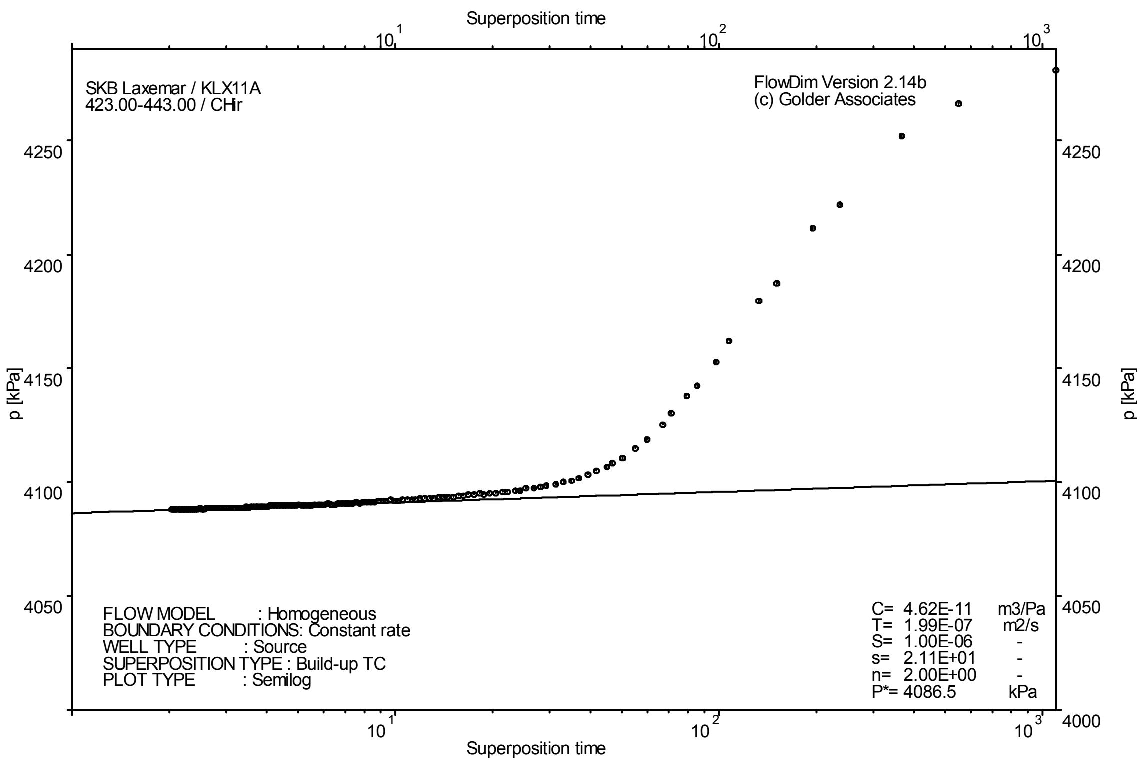
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

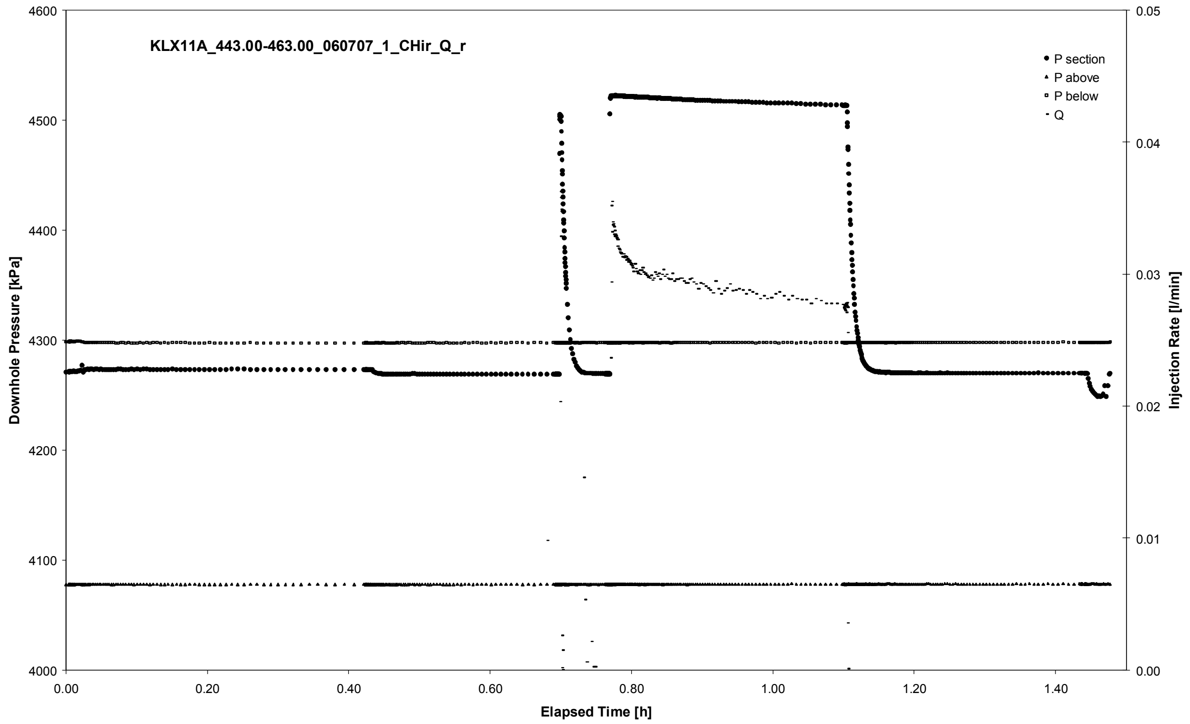


CHIR phase; HORNER match

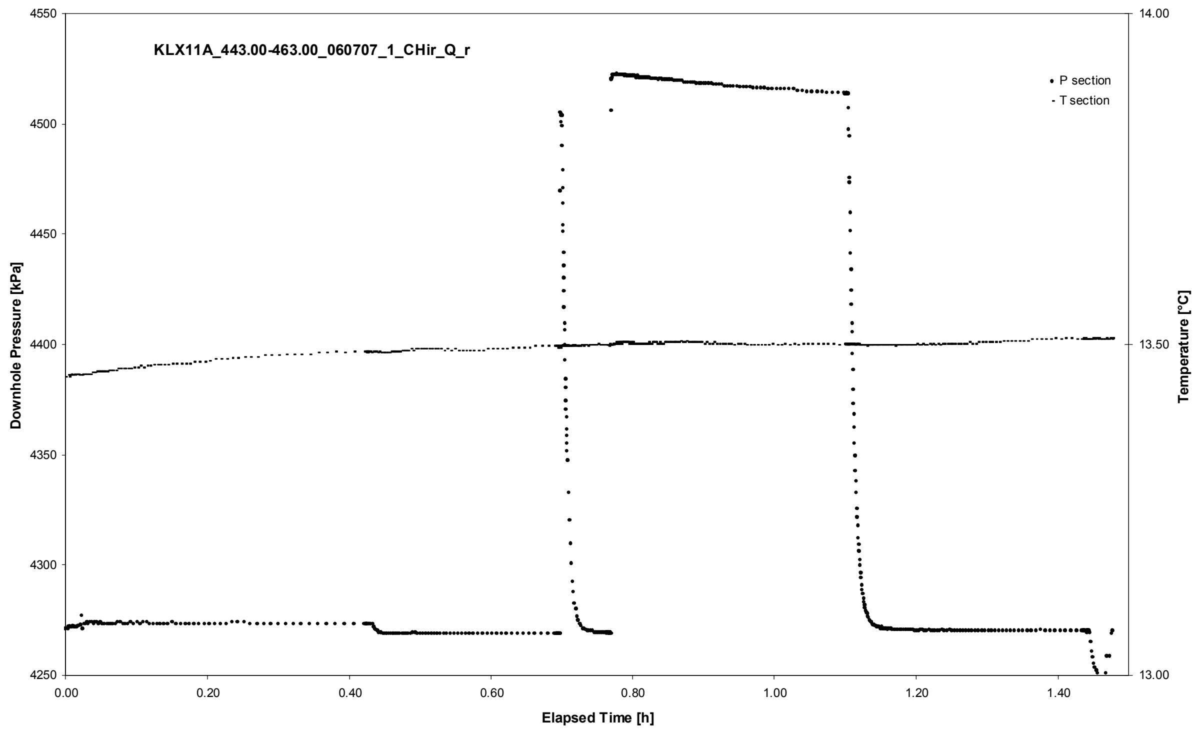
APPENDIX 2-27

Test 443.00 – 463.00 m

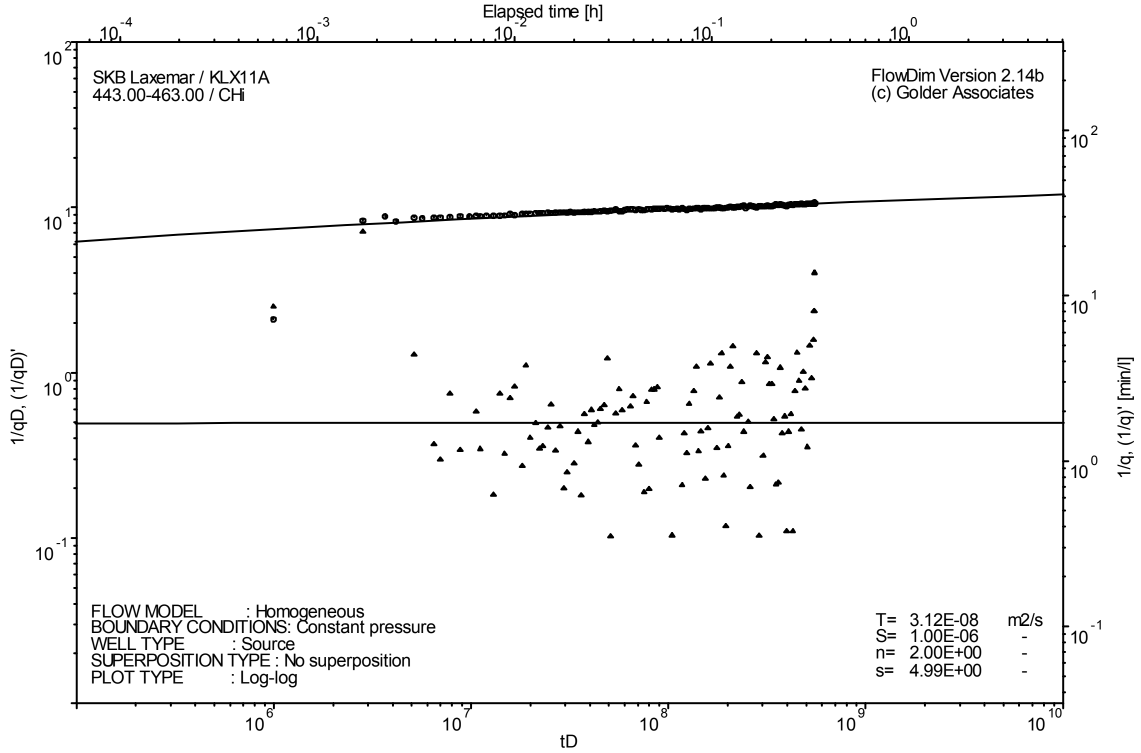
Analysis diagrams



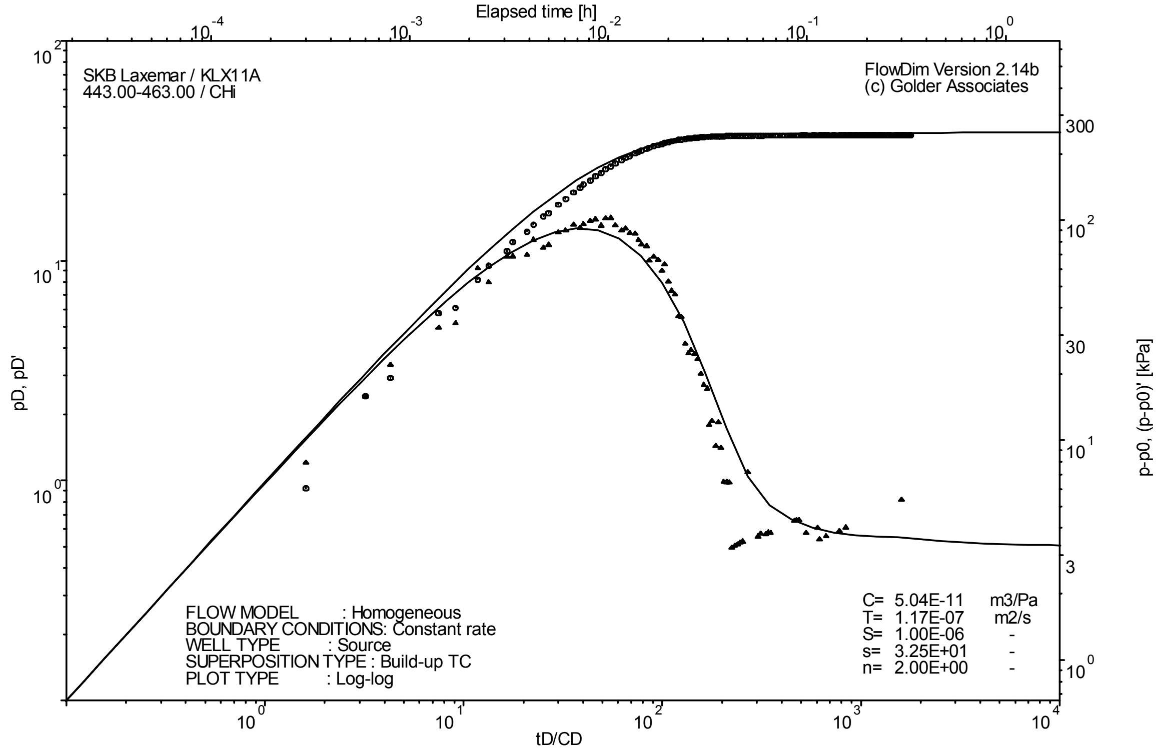
Pressure and flow rate vs. time; cartesian plot



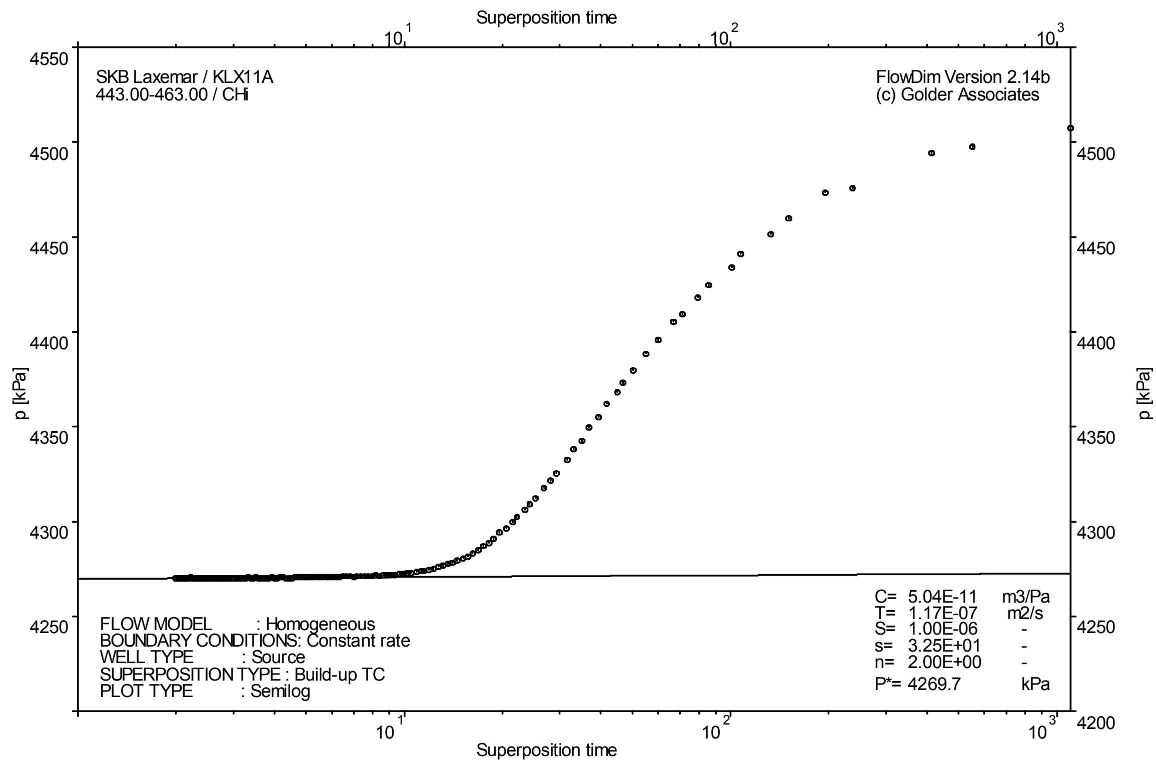
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

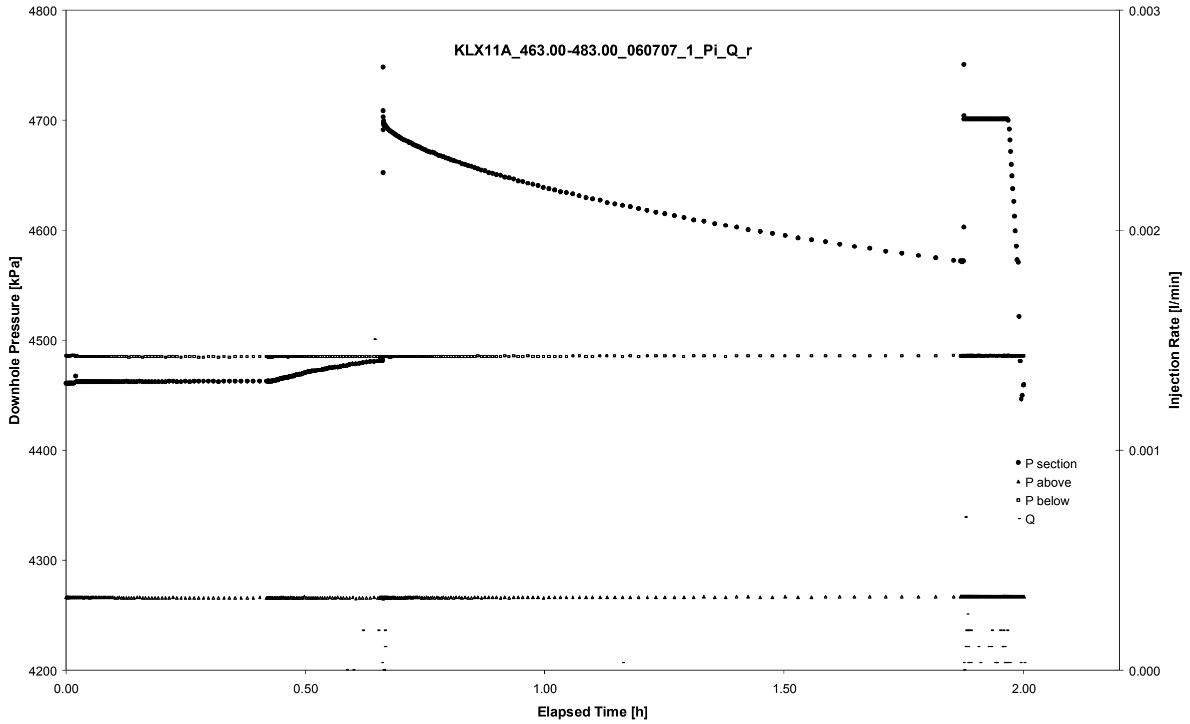


CHIR phase; HORNER match

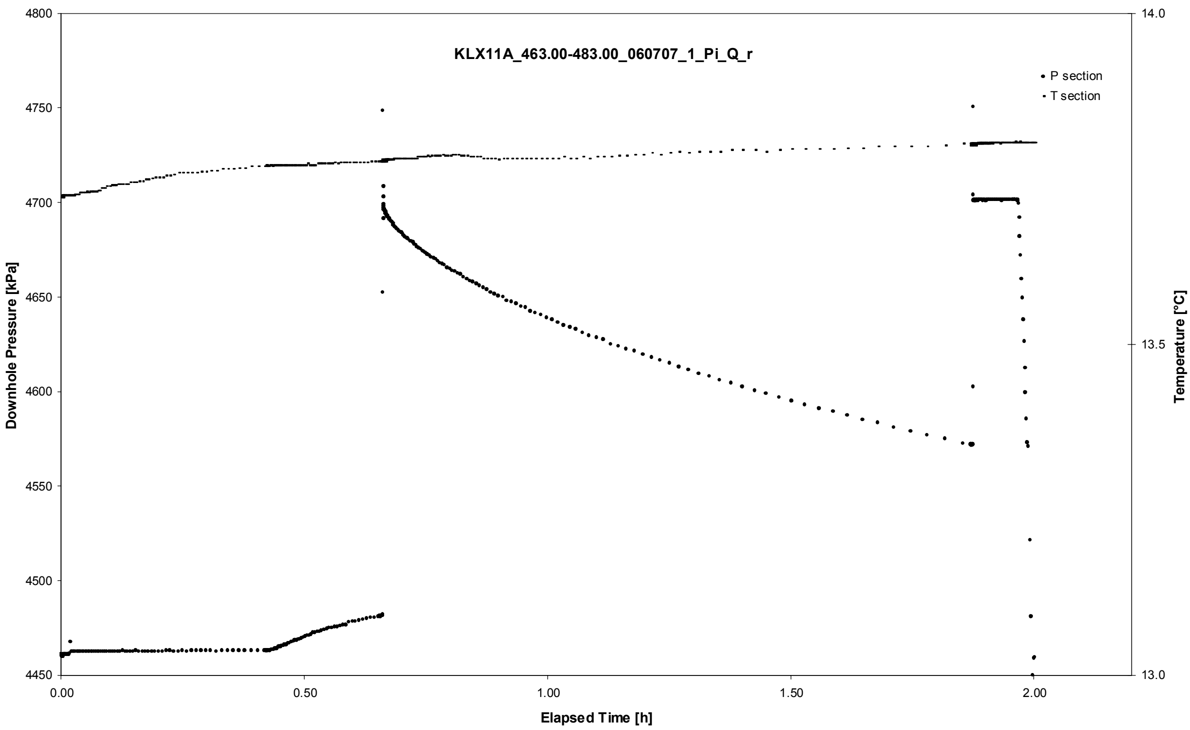
APPENDIX 2-28

Test 463.00 – 483.00 m

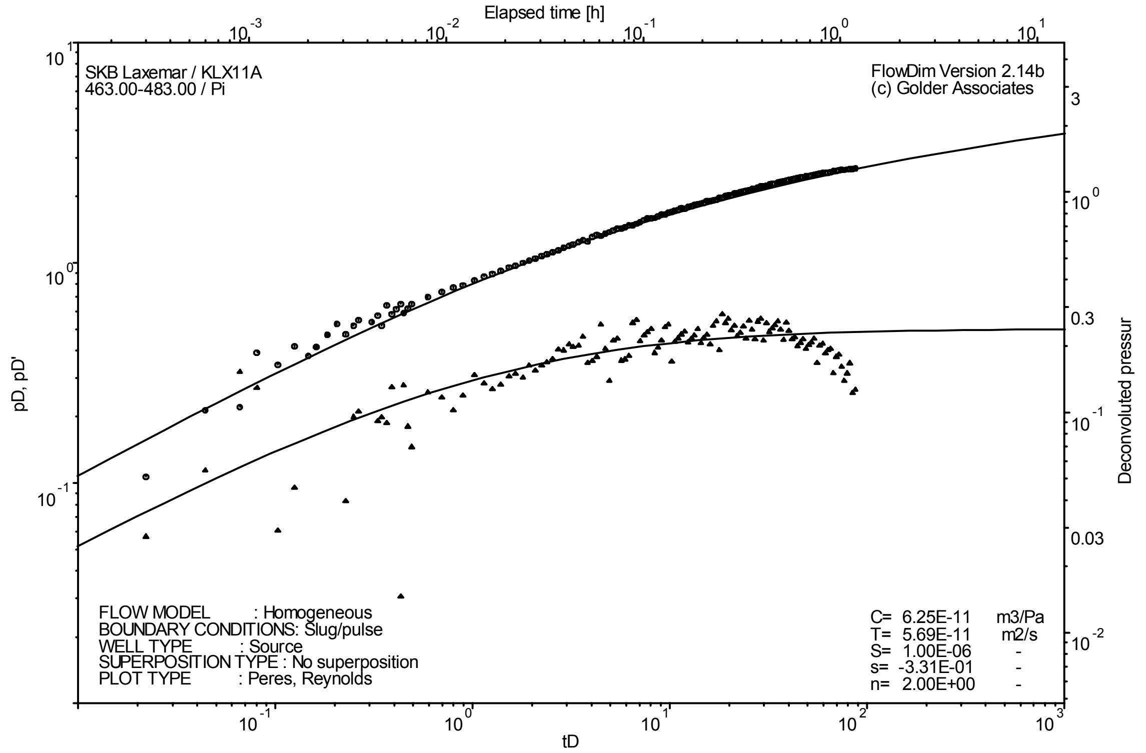
Analysis diagrams



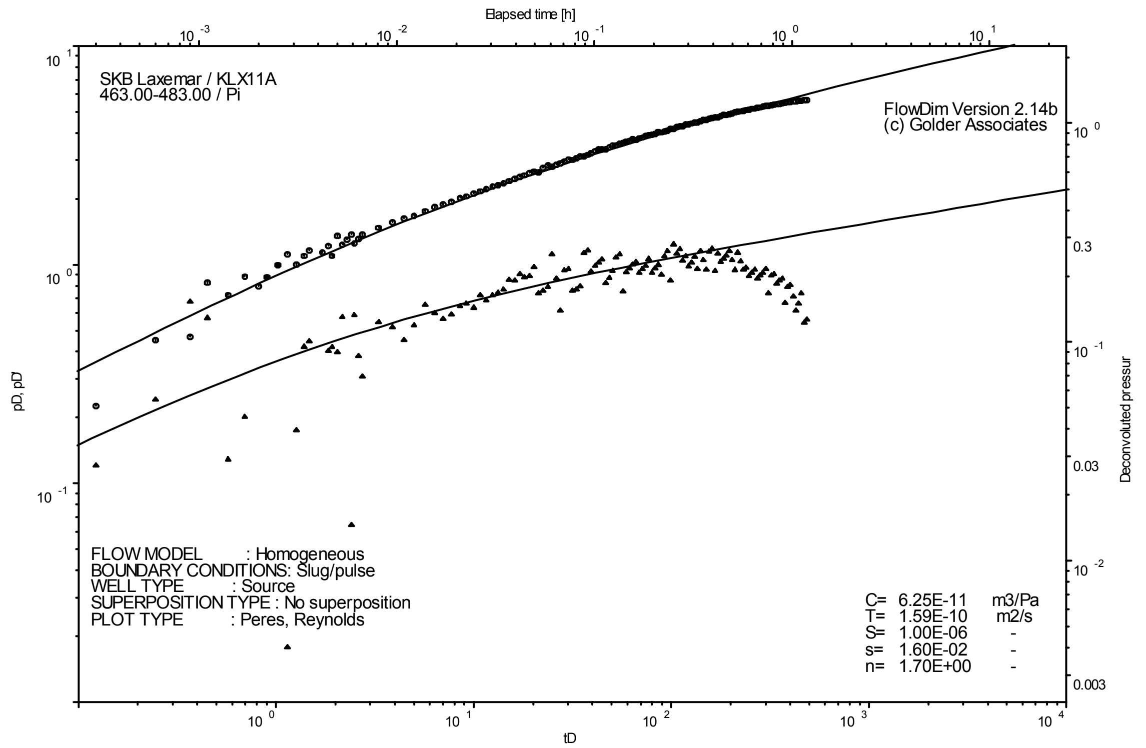
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



Pulse injection; deconvolution match

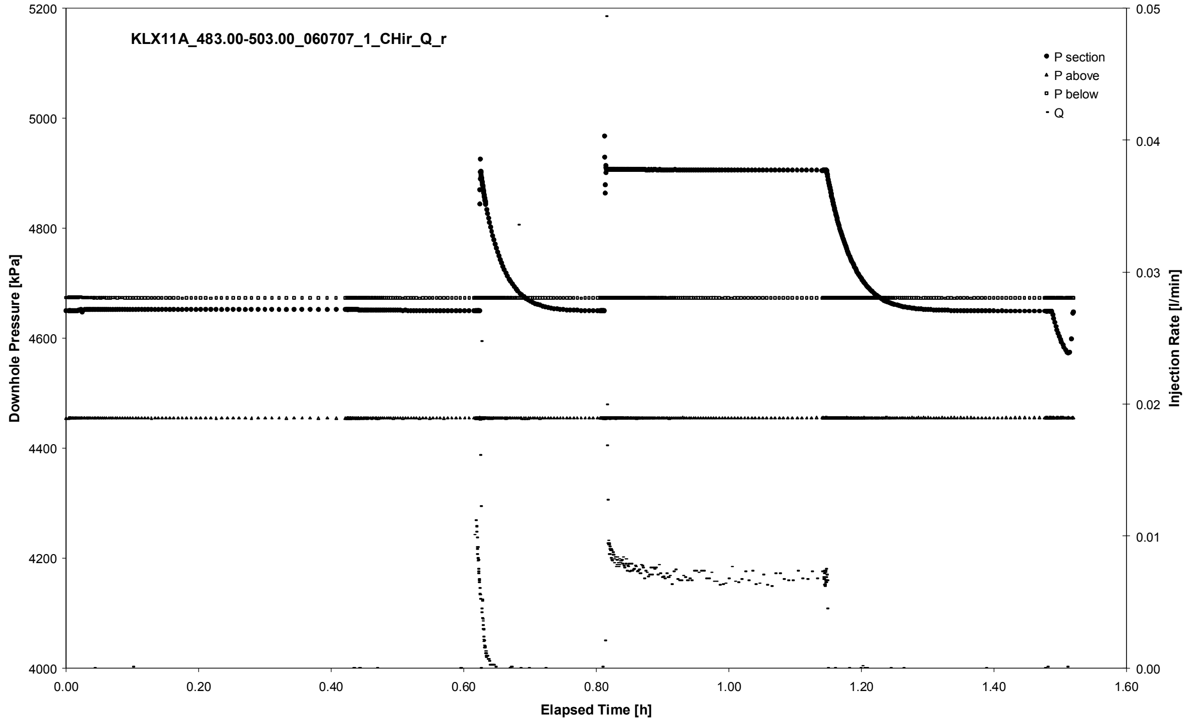


Pulse injection; deconvolution match (n=1.7)

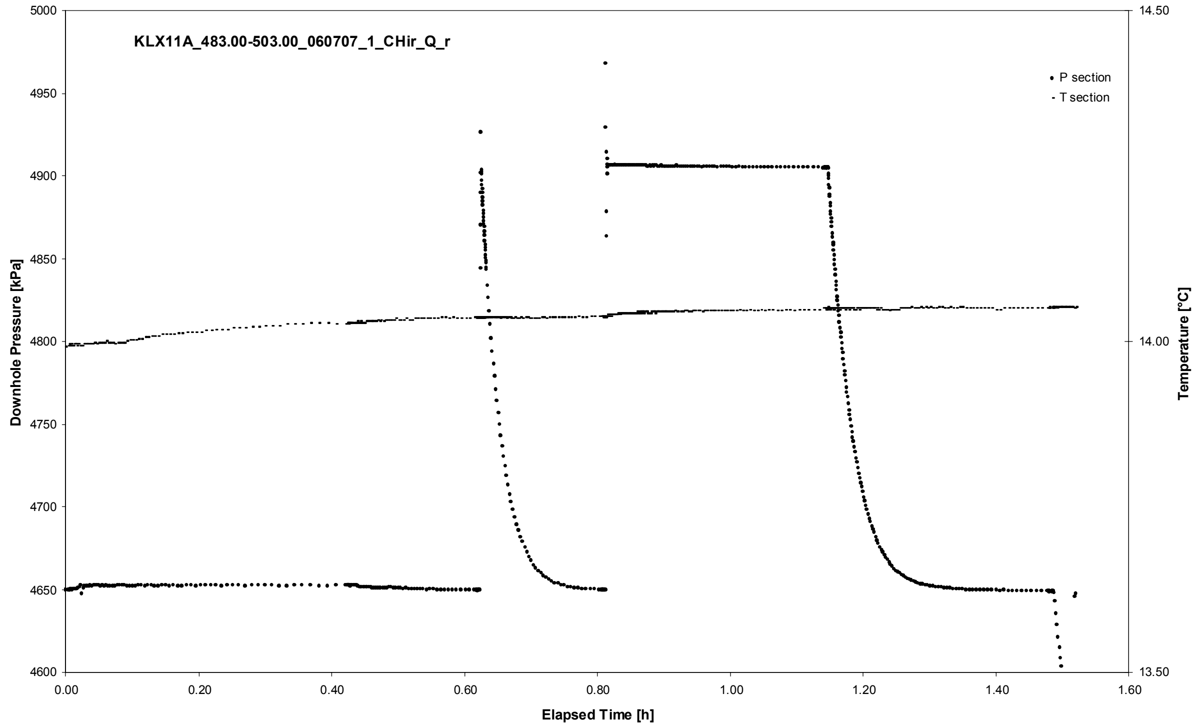
APPENDIX 2-29

Test 483.00 – 503.00 m

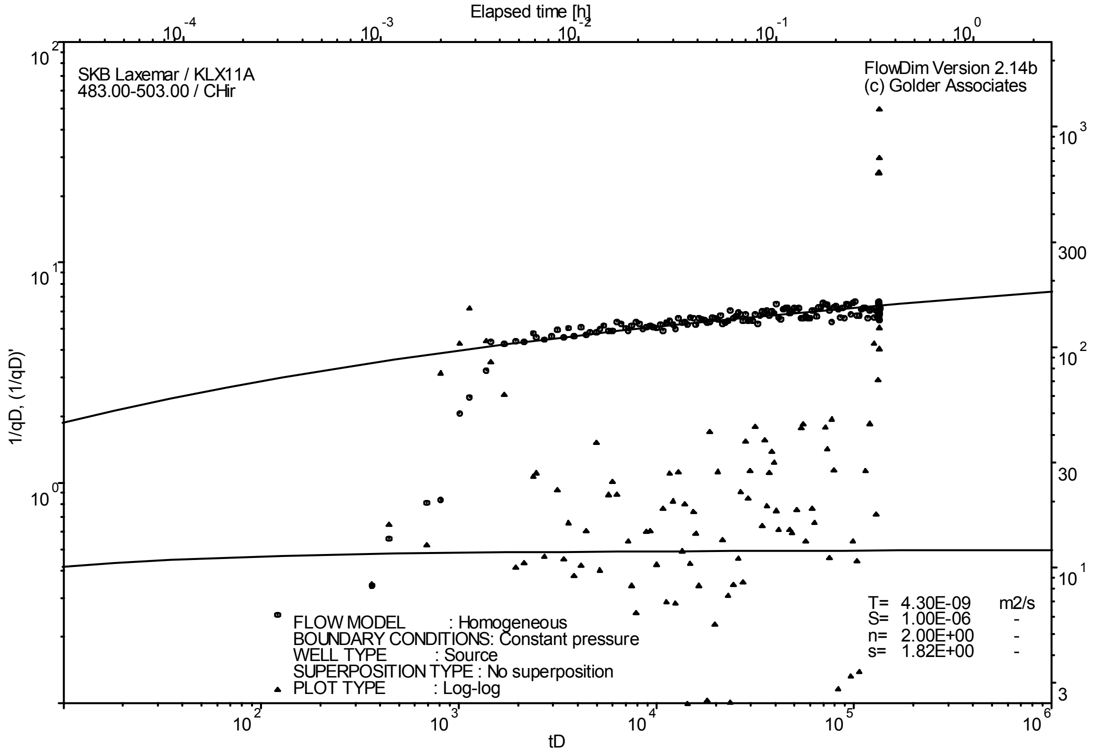
Analysis diagrams



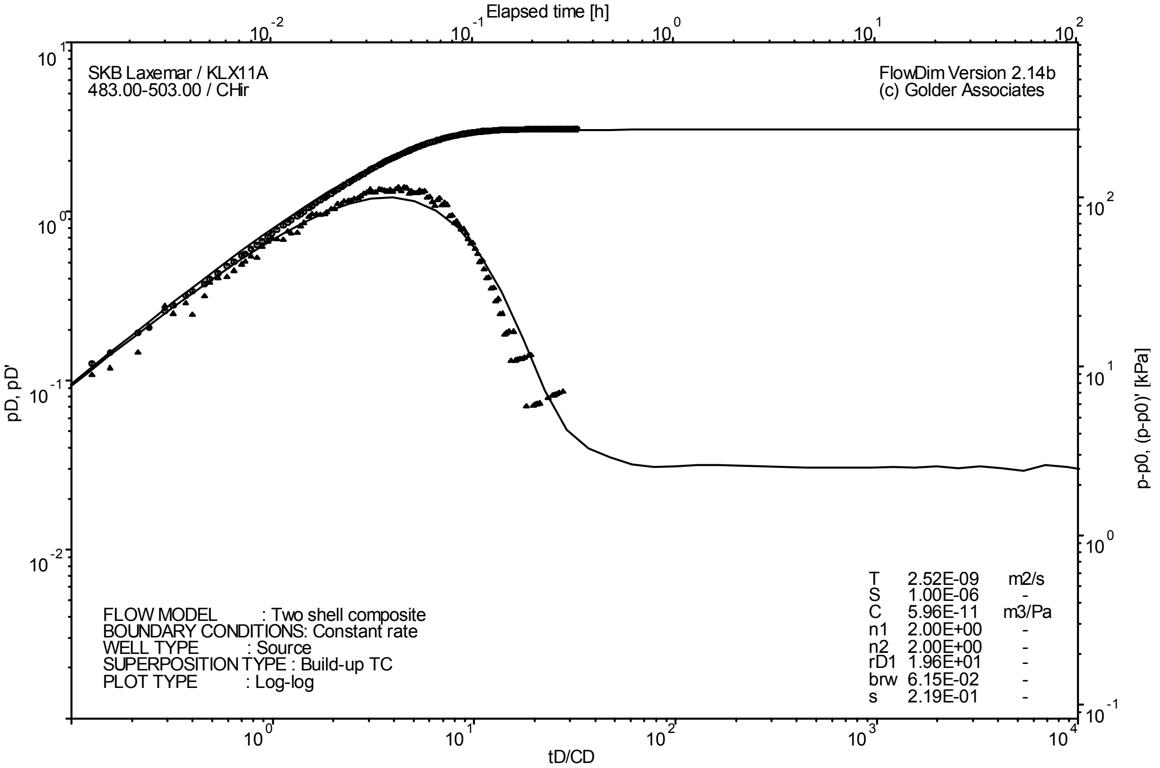
Pressure and flow rate vs. time; cartesian plot



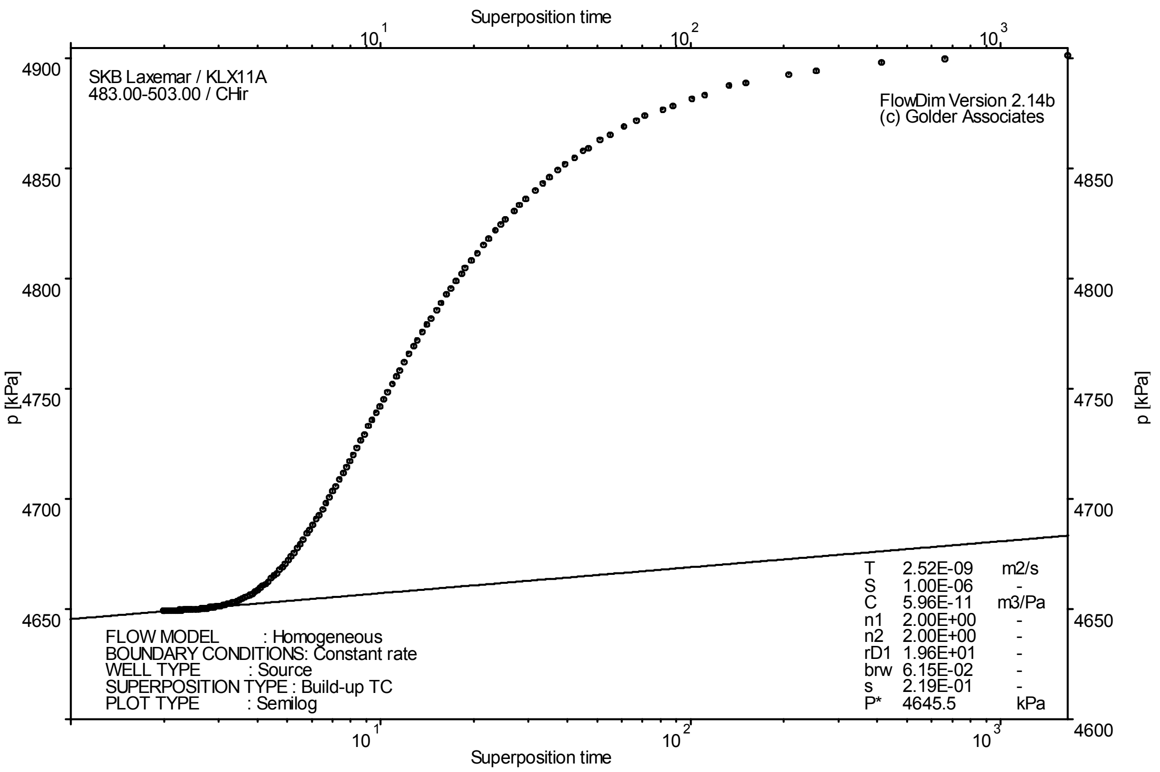
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

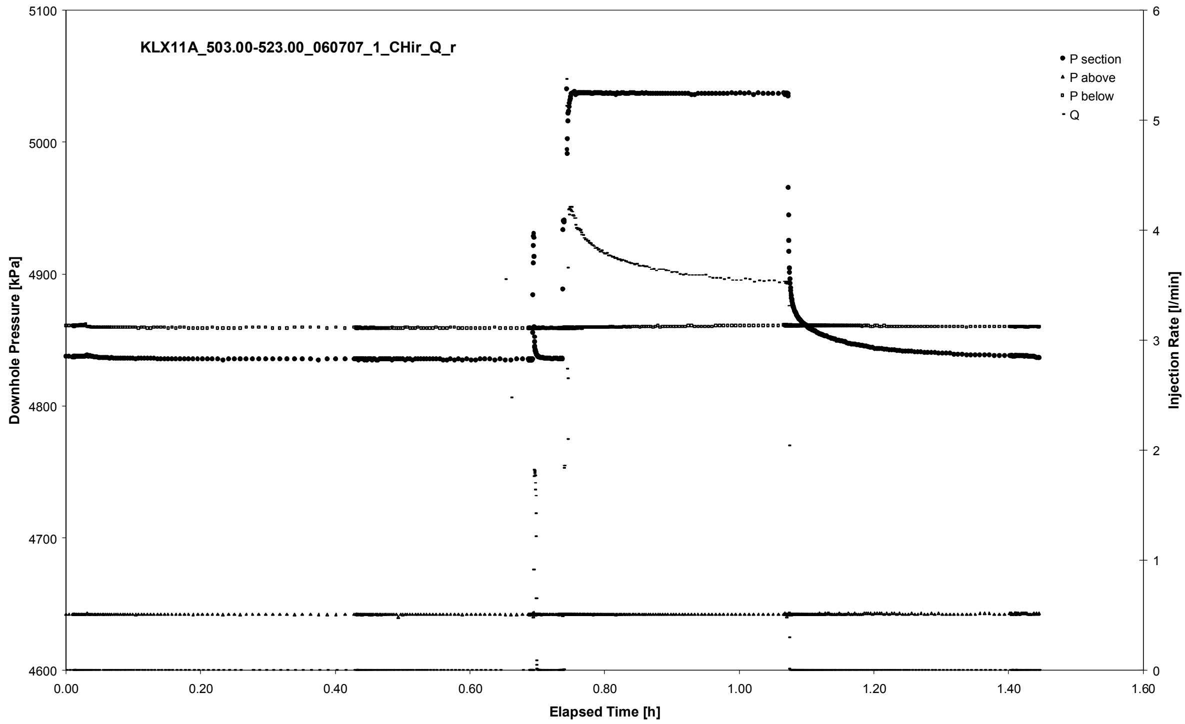


CHIR phase; HORNER match

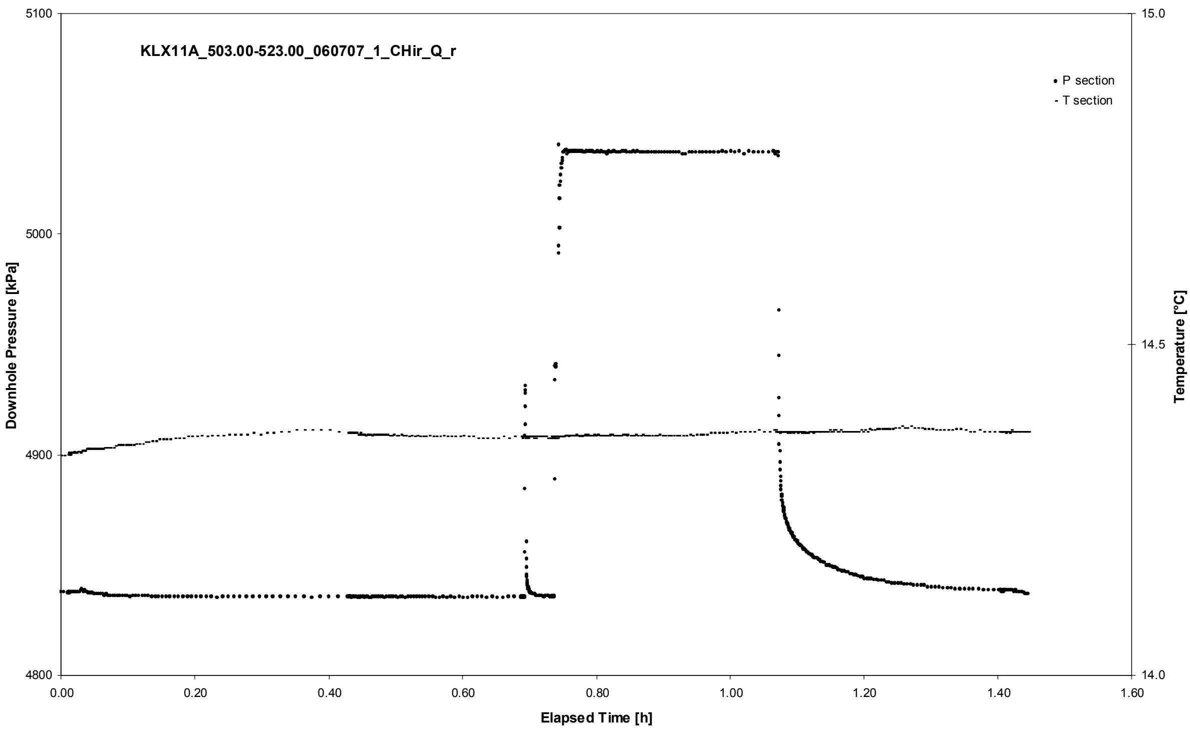
APPENDIX 2-30

Test 503.00 – 523.00 m

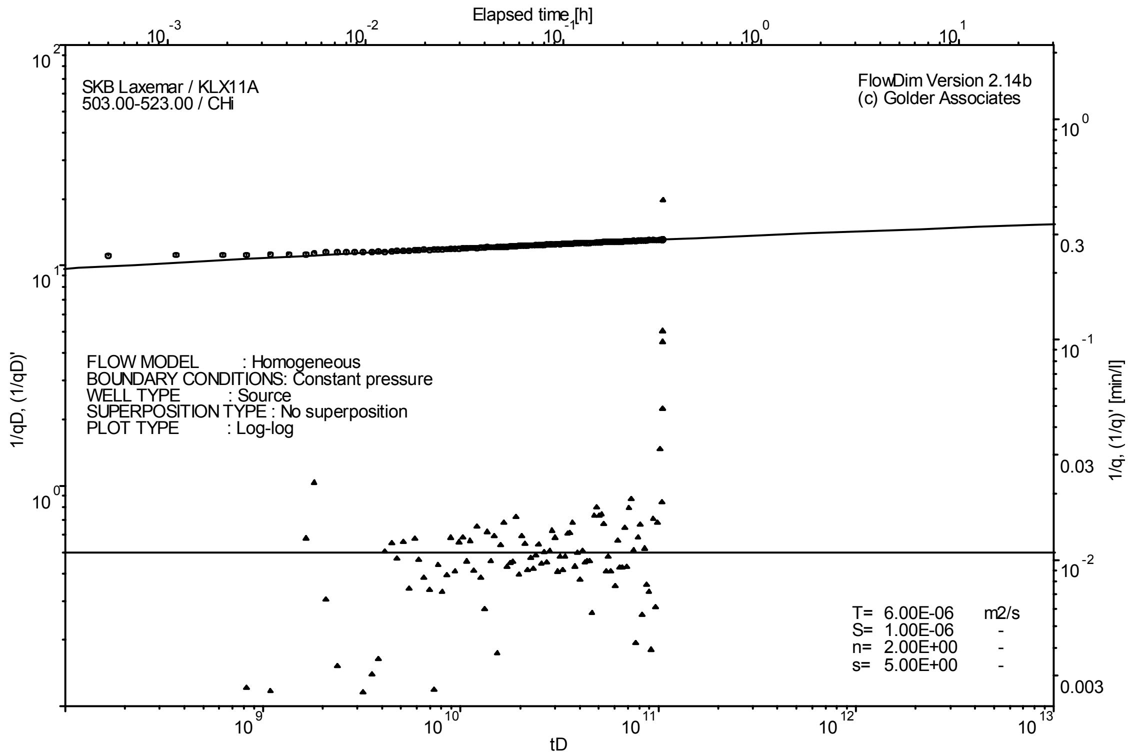
Analysis diagrams



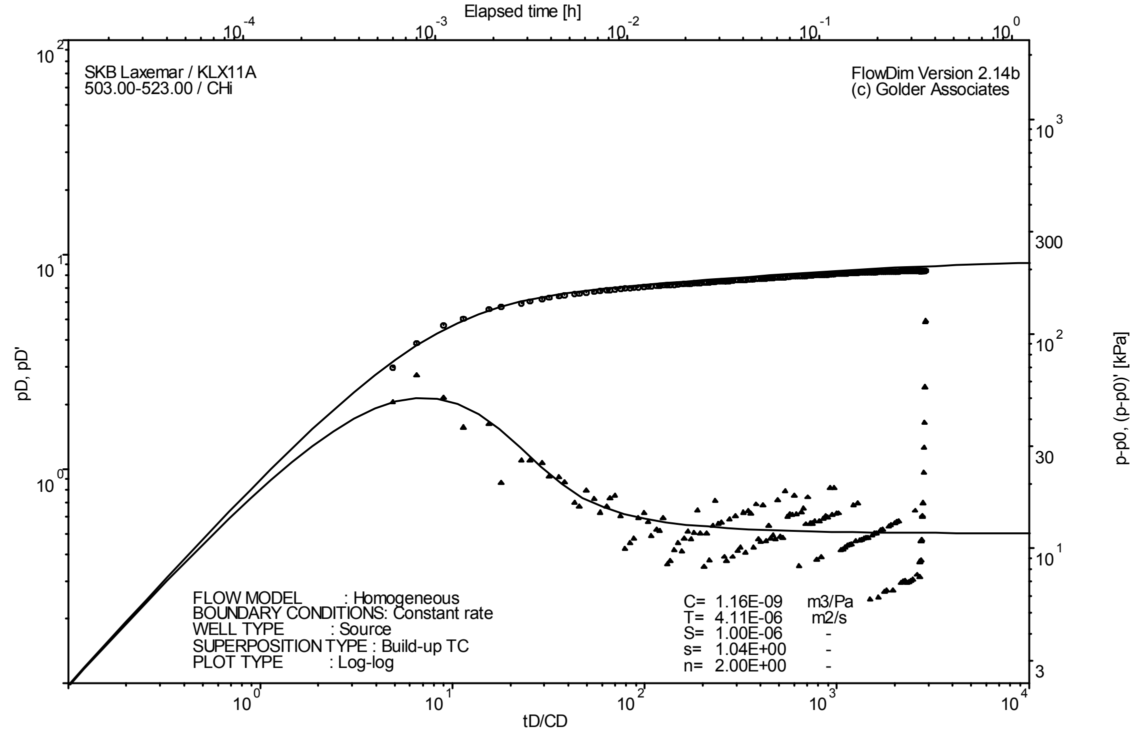
Pressure and flow rate vs. time; cartesian plot



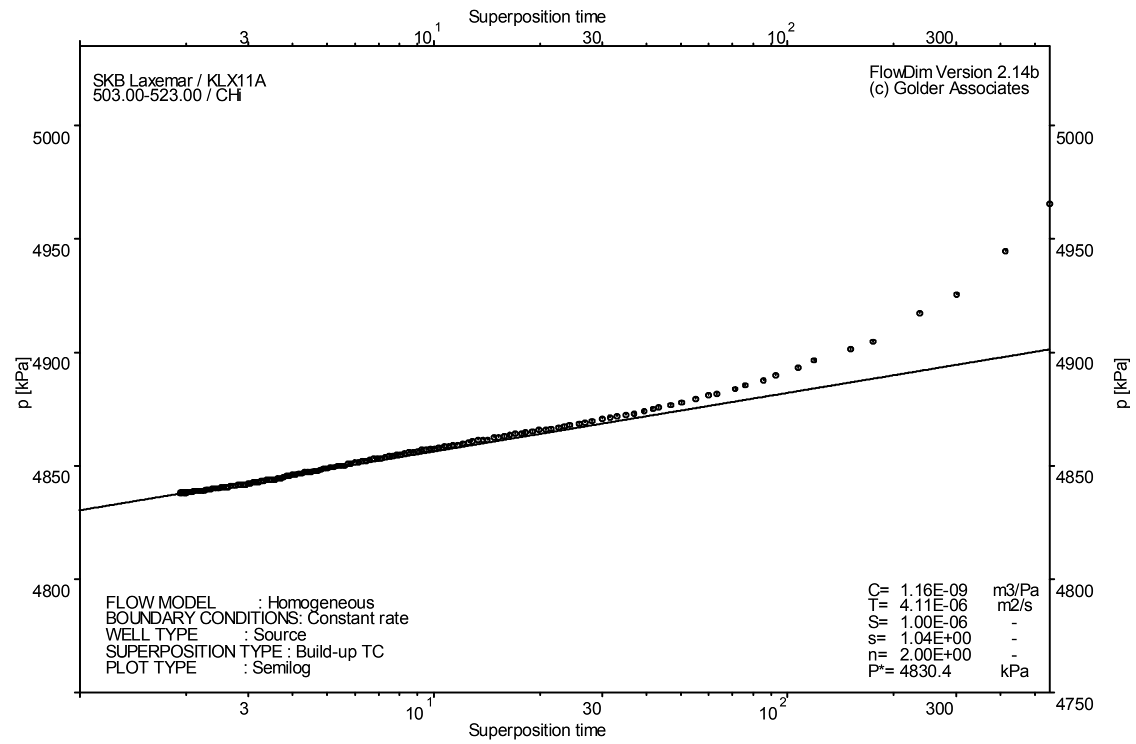
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

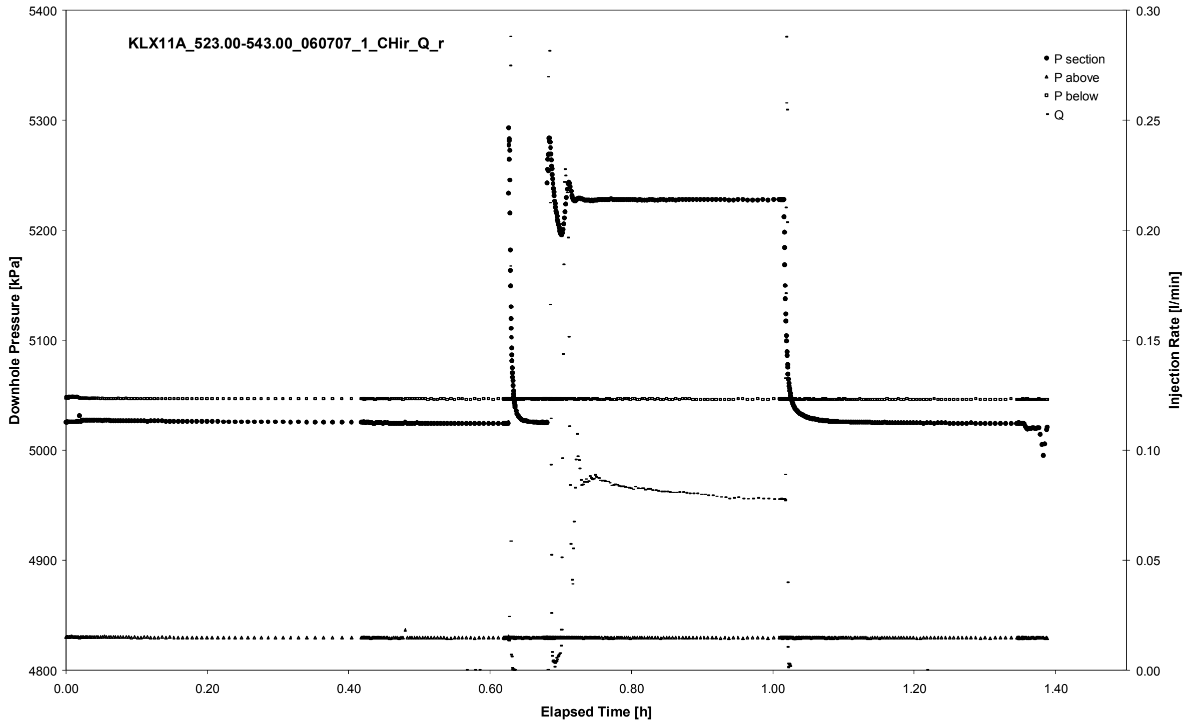


CHIR phase; HORNER match

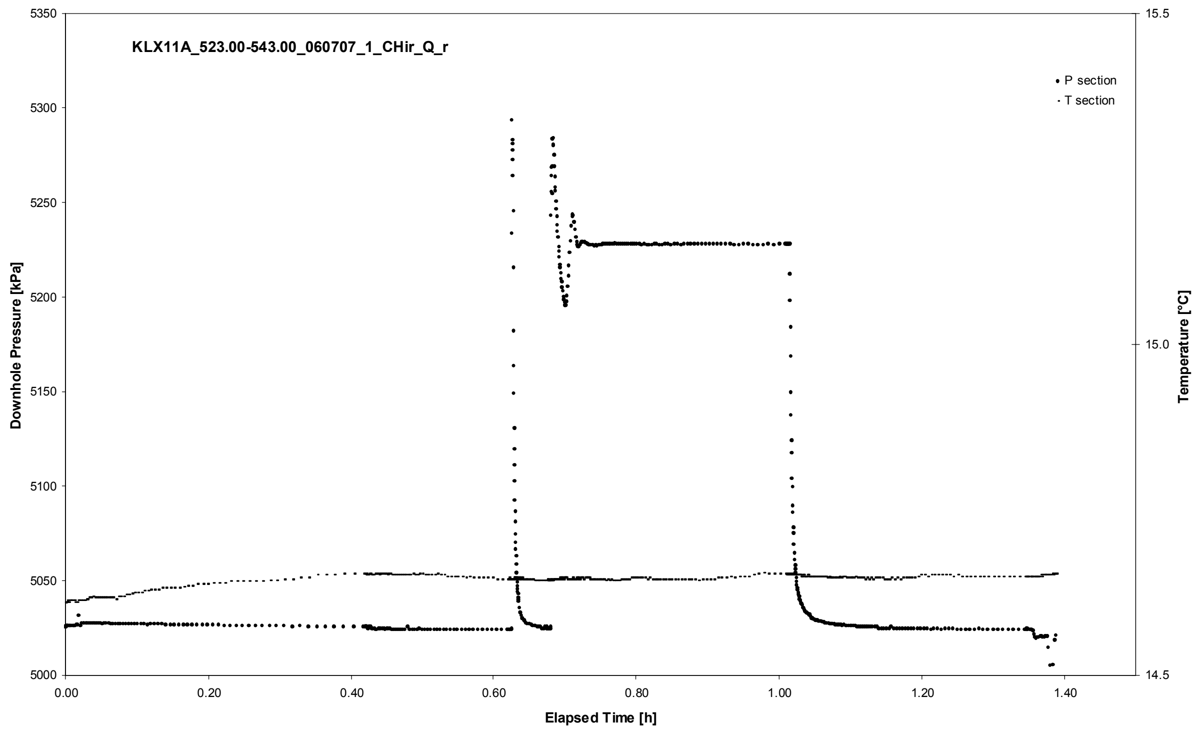
APPENDIX 2-31

Test 523.00 – 543.00 m

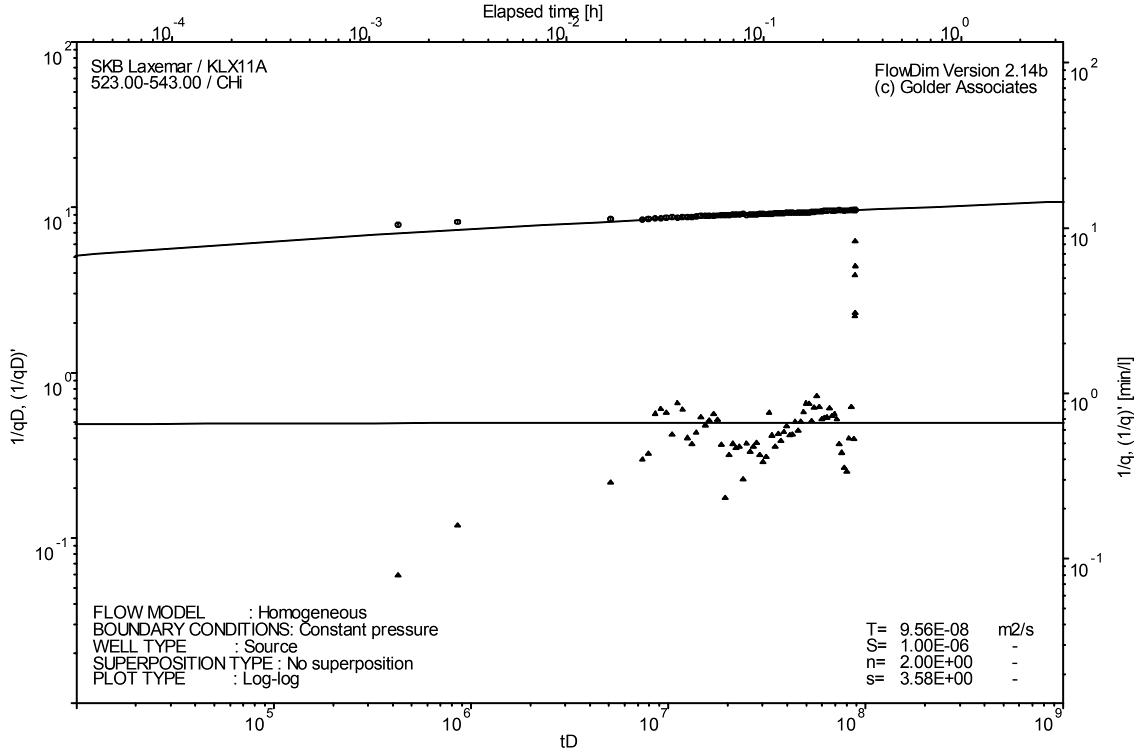
Analysis diagrams



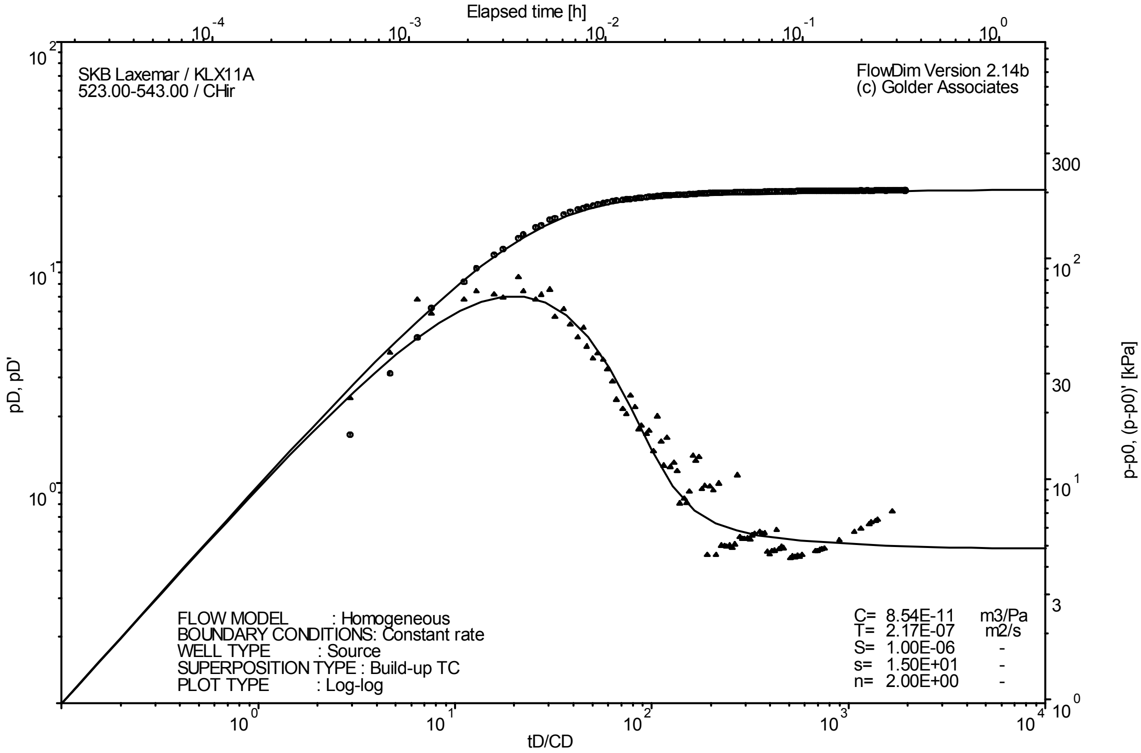
Pressure and flow rate vs. time; cartesian plot



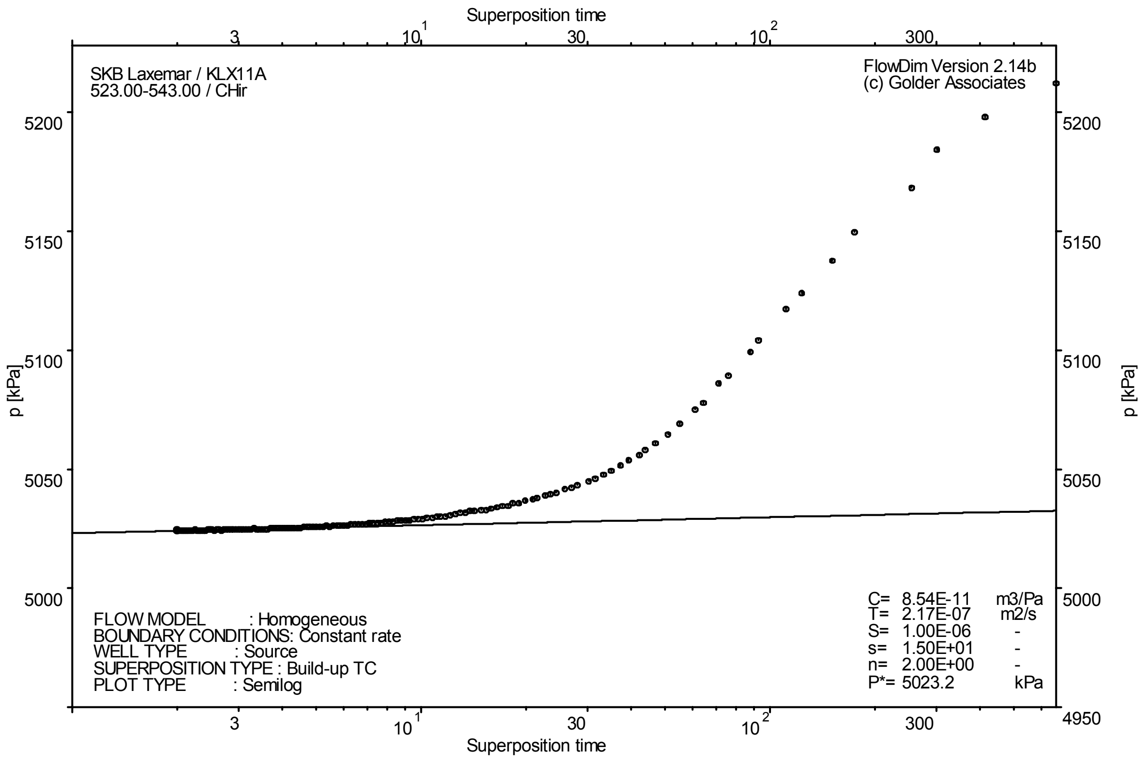
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

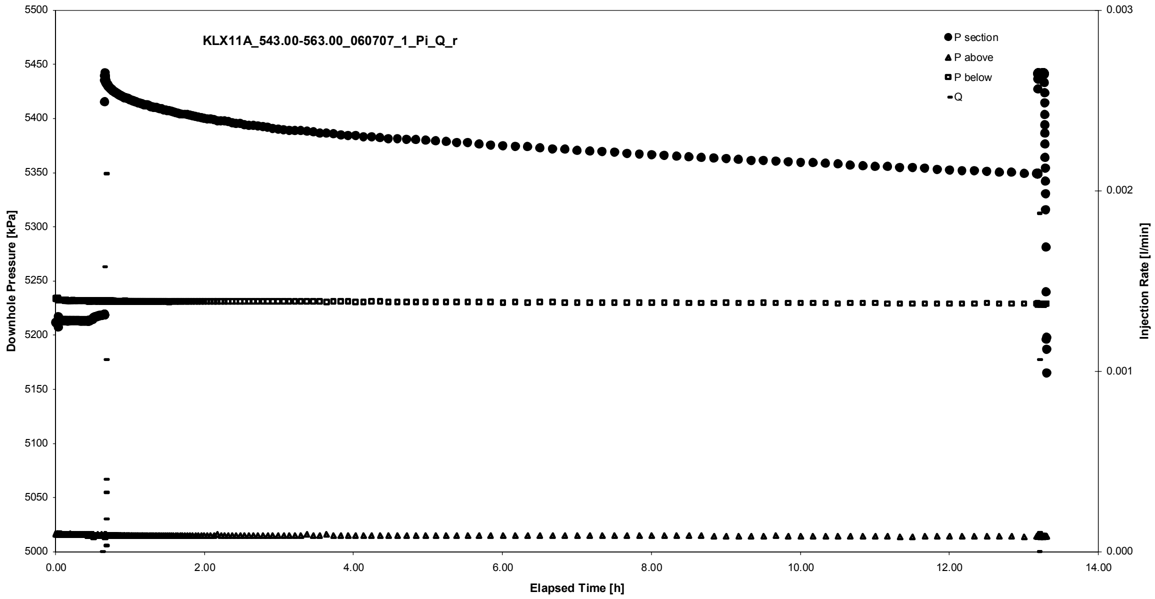


CHIR phase; HORNER match

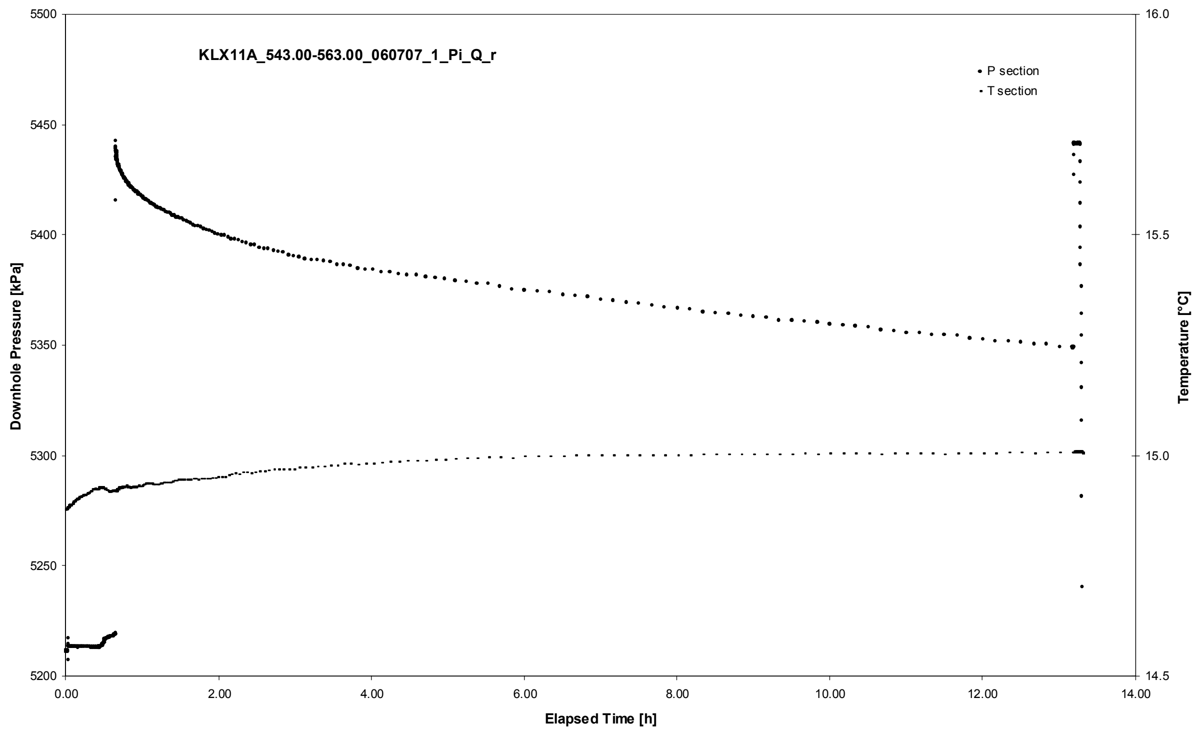
APPENDIX 2-32

Test 543.00 – 563.00 m

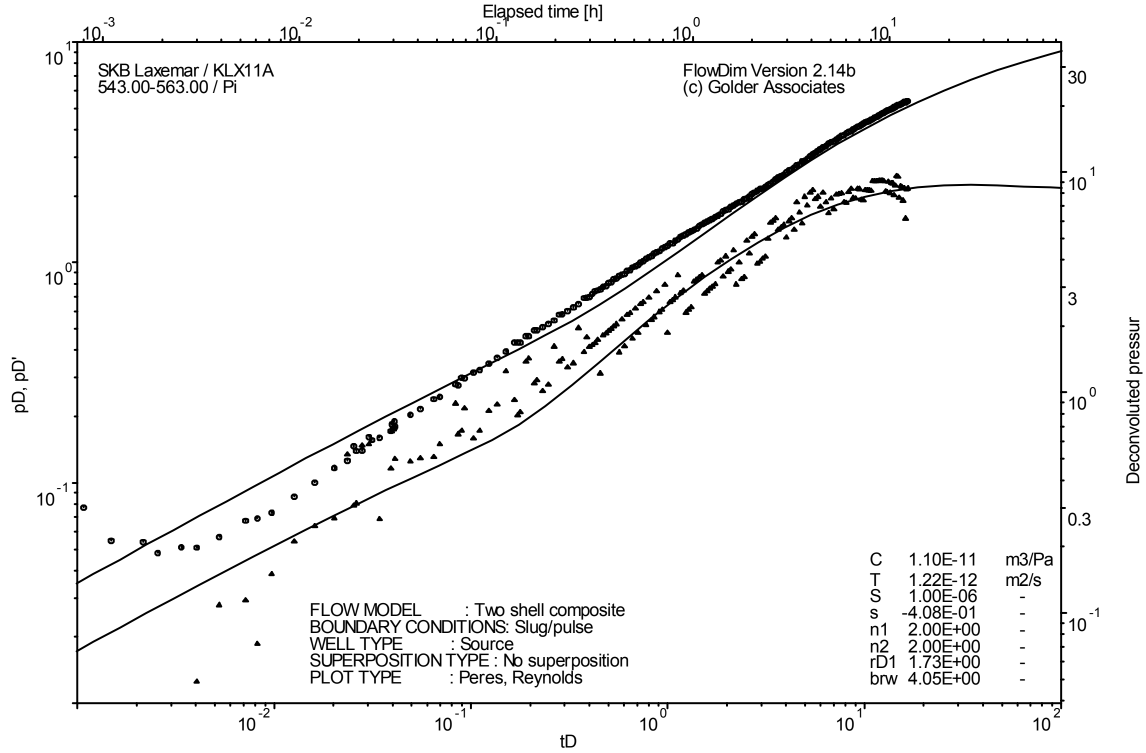
Analysis diagrams



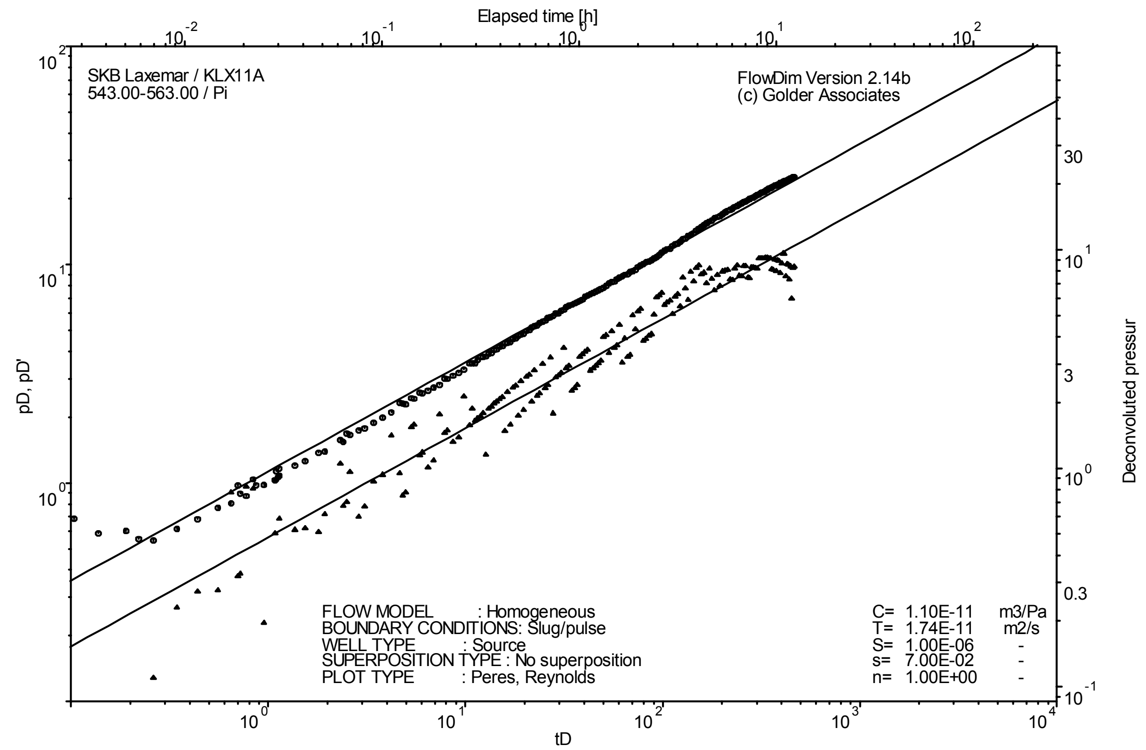
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



Pulse injection; deconvolution match

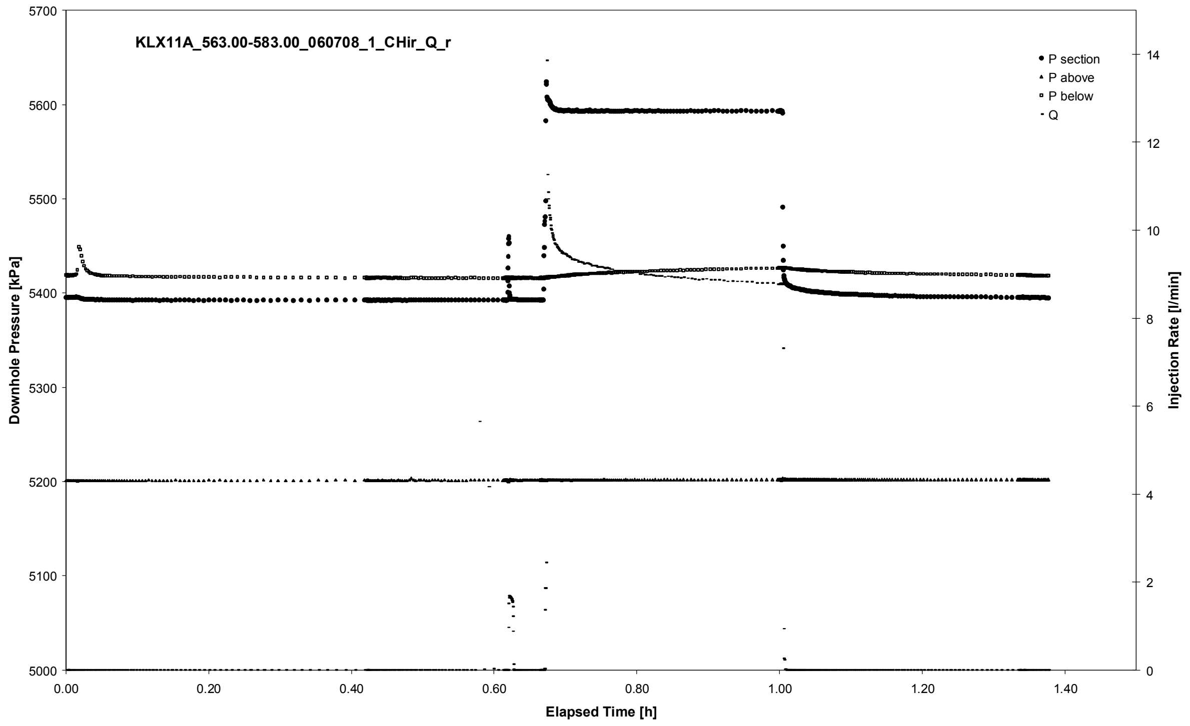


Pulse injection; deconvolution match (n=1)

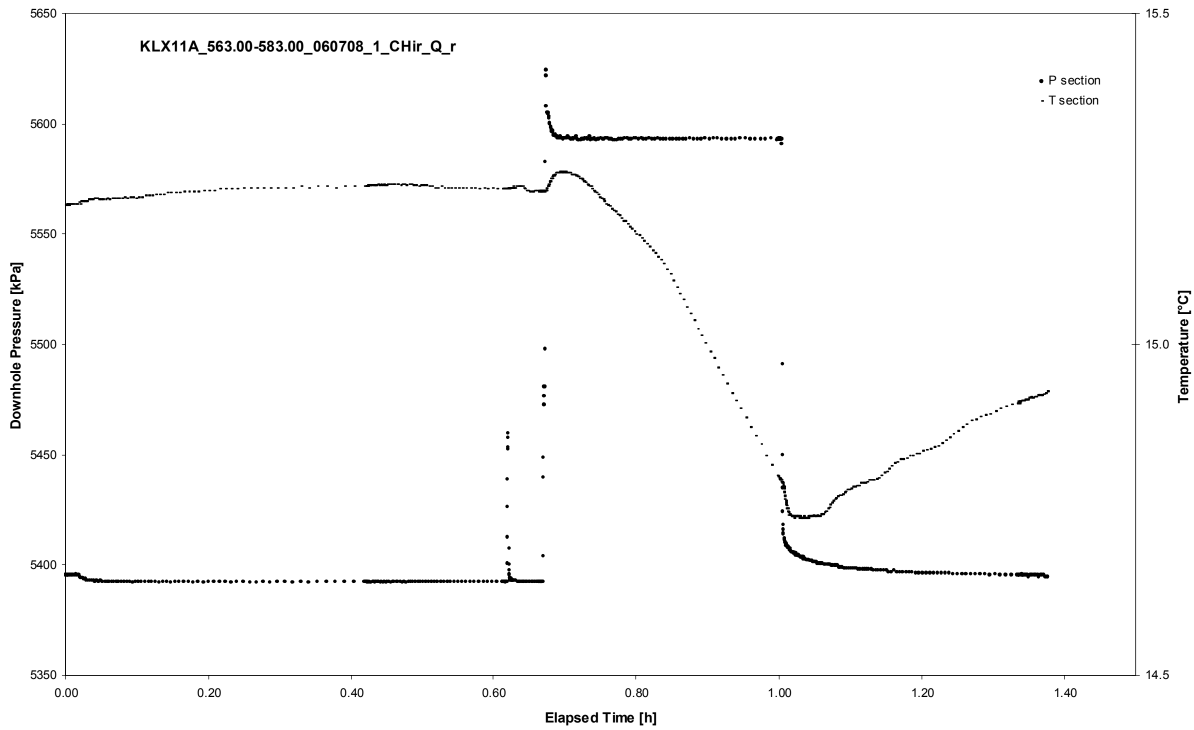
APPENDIX 2-33

Test 563.00 – 583.00 m

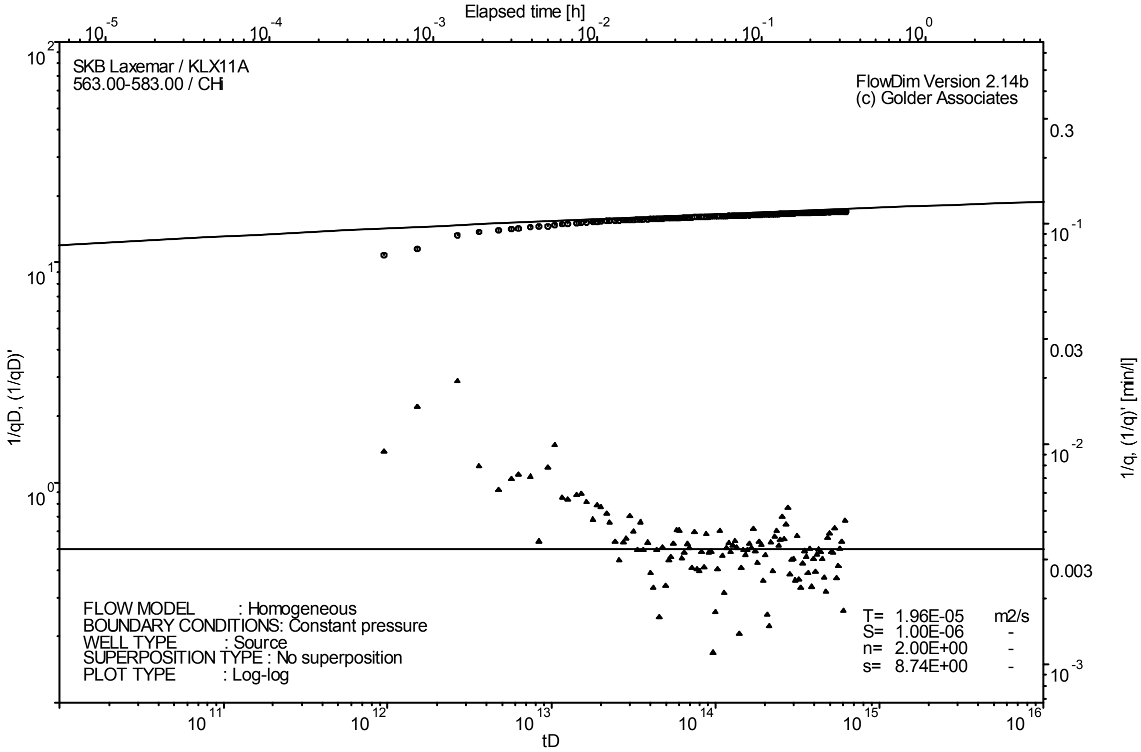
Analysis diagrams



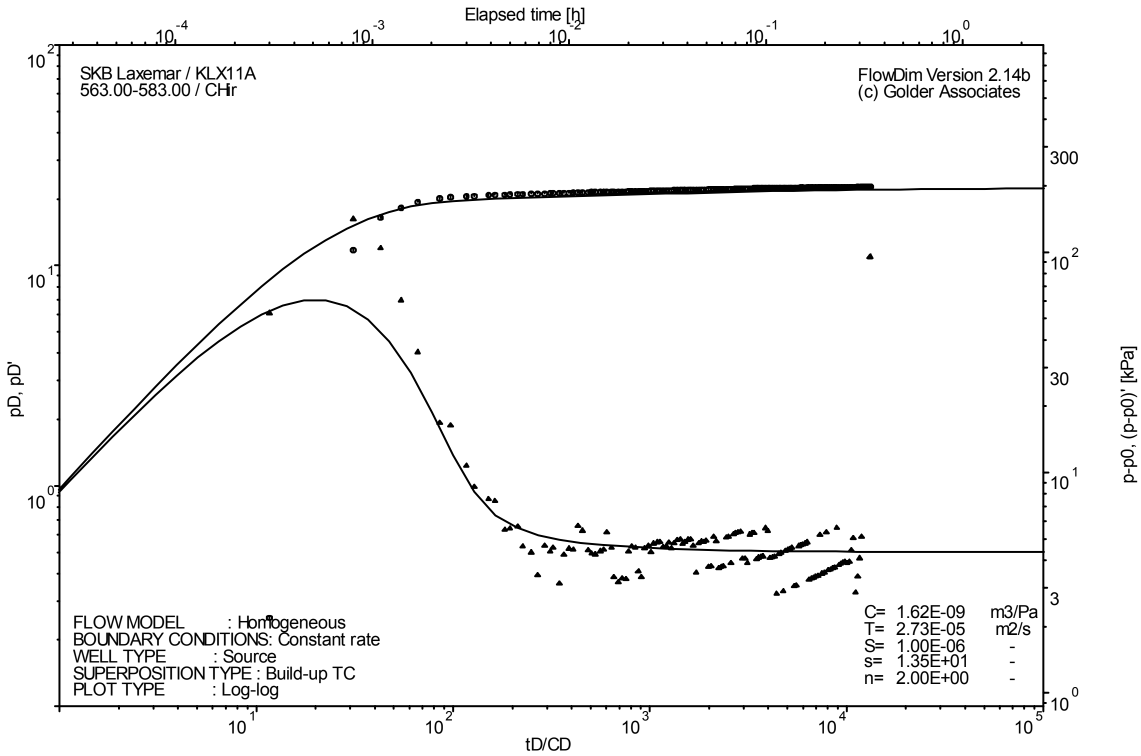
Pressure and flow rate vs. time; cartesian plot



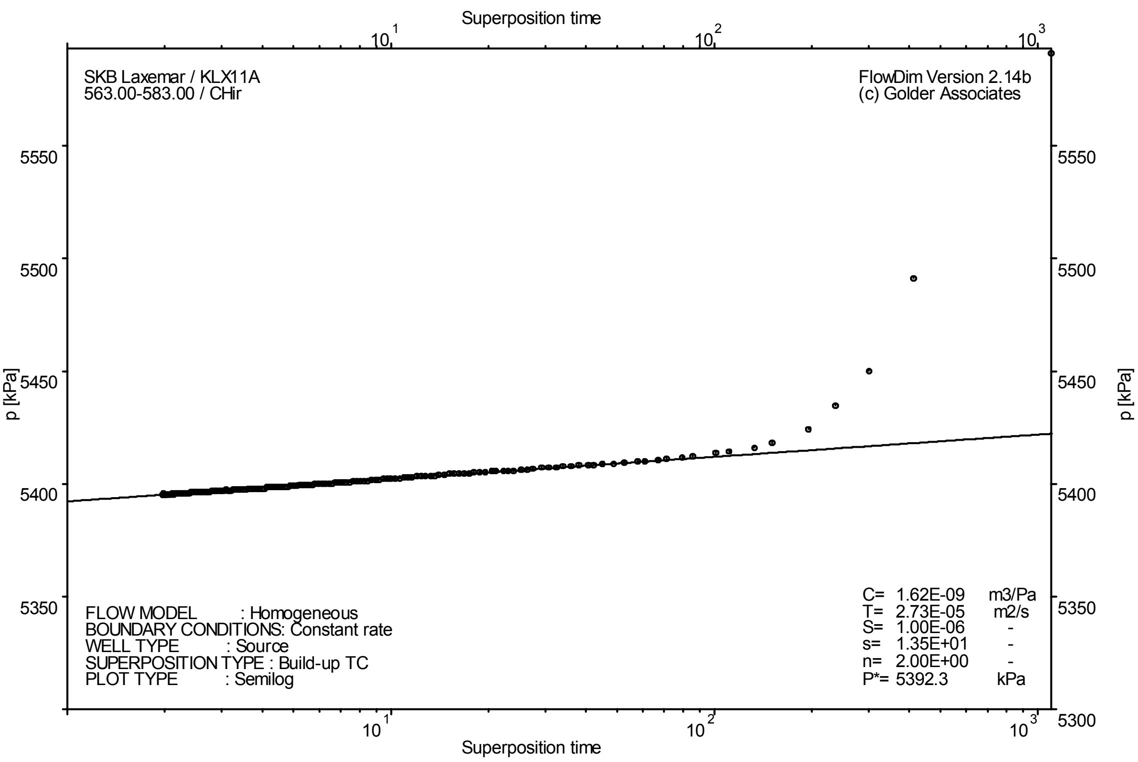
Interval pressure and temperature vs. time; cartesian plot



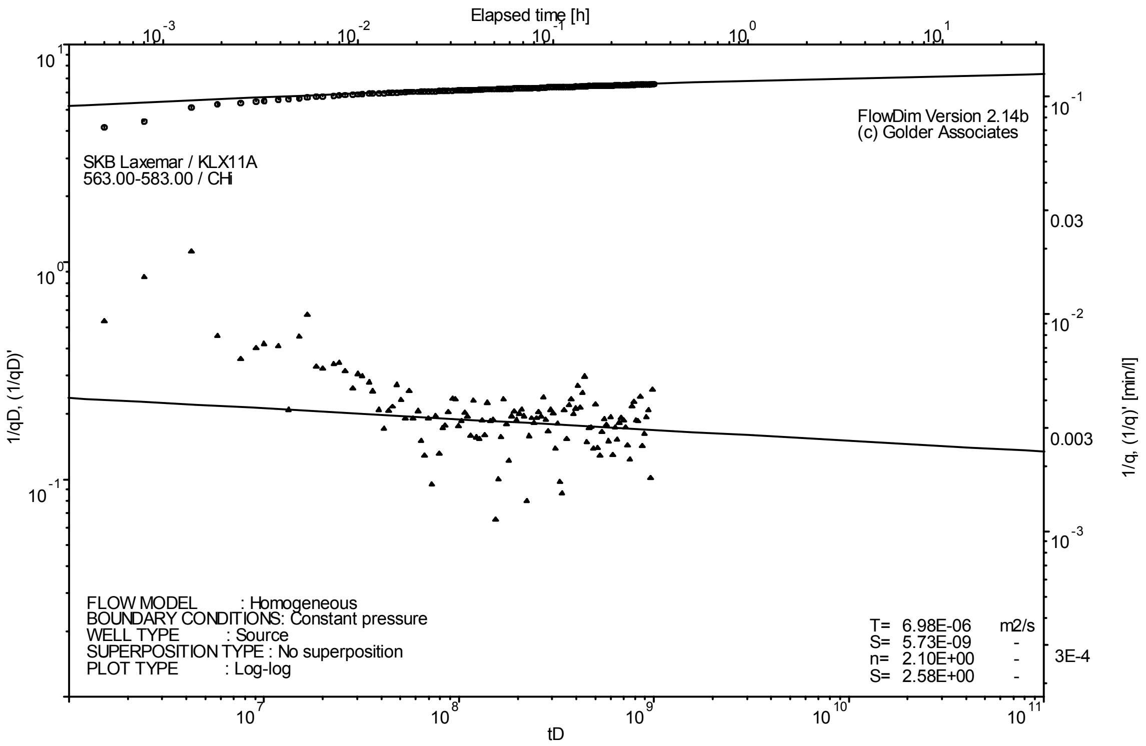
CHI phase; log-log match



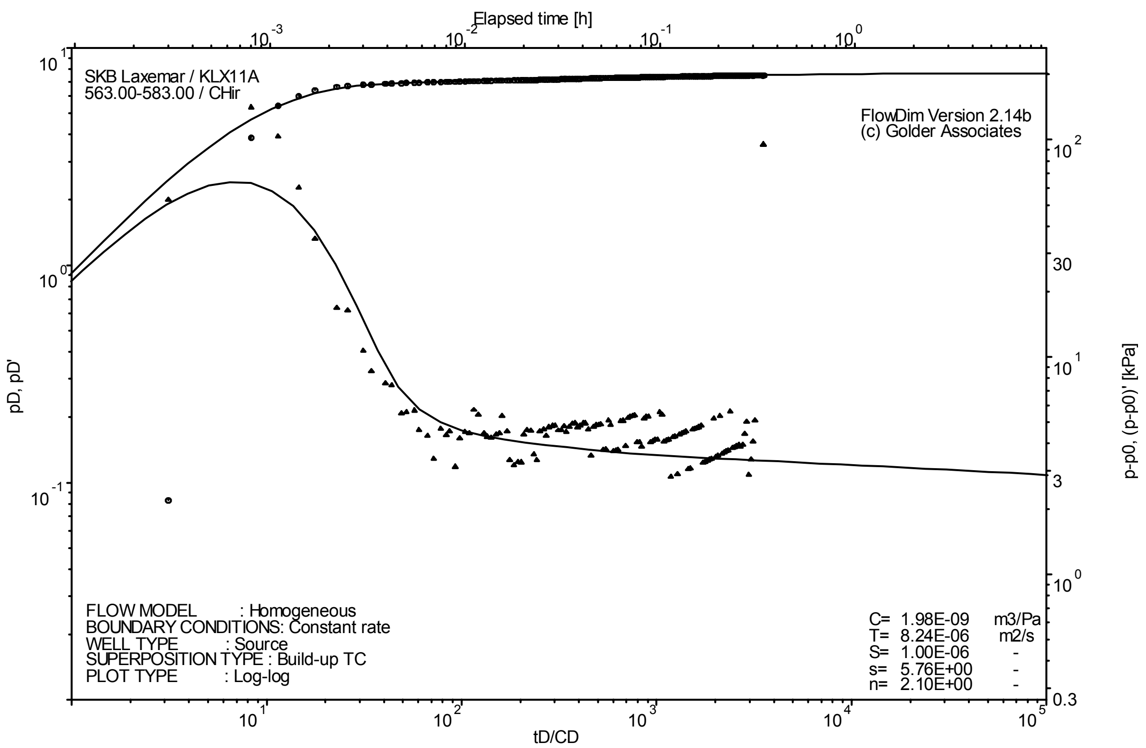
CHIR phase; log-log match



CHIR phase; HORNER match



CHI phase; log-log match (n=2.1)

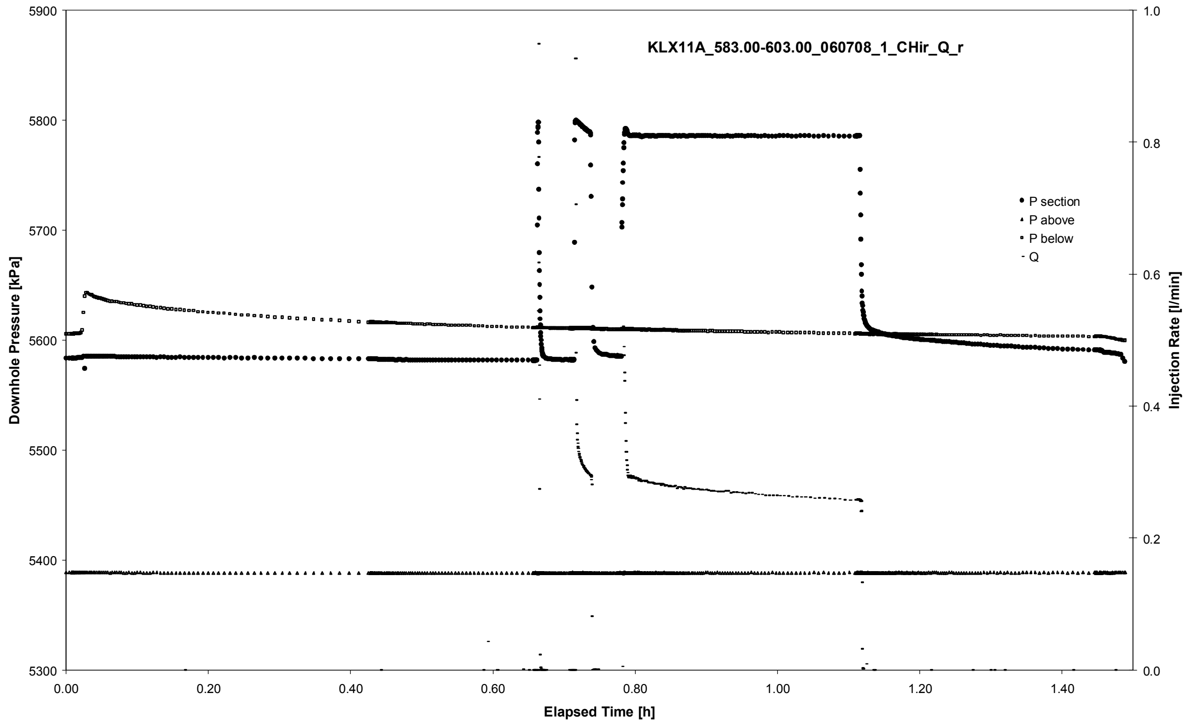


CHIR phase; log-log match (n=2.1)

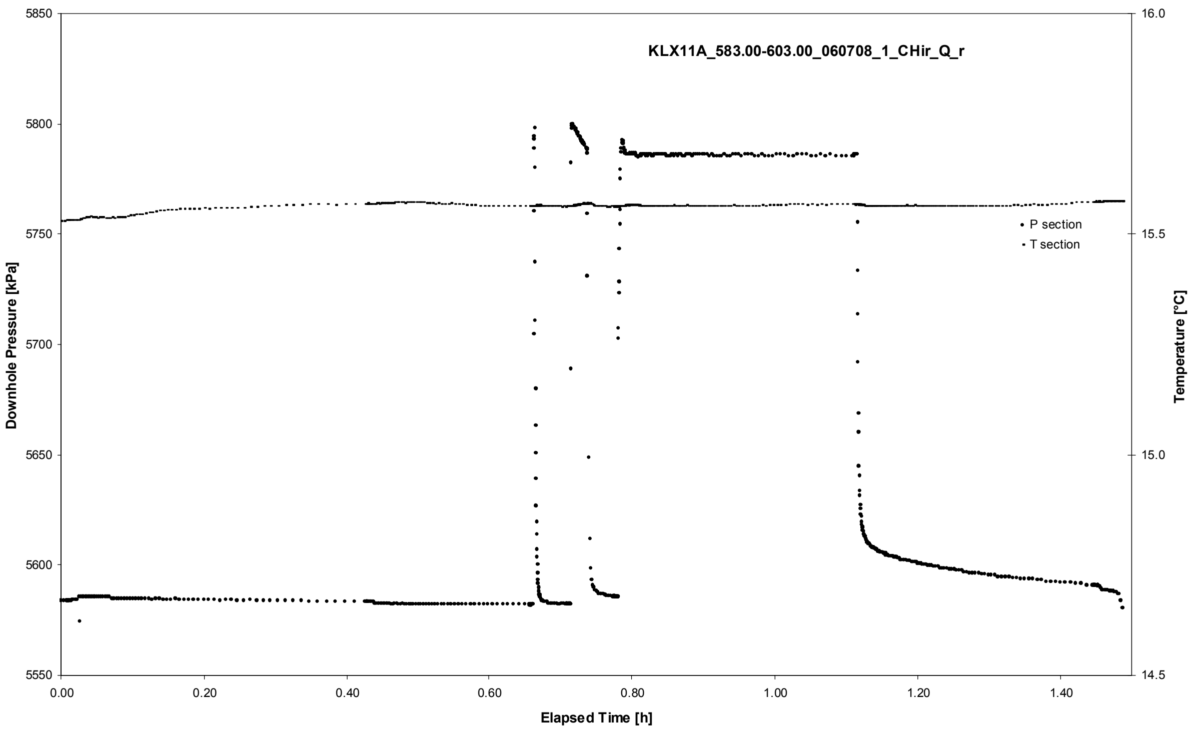
APPENDIX 2-34

Test 583.00 – 603.00 m

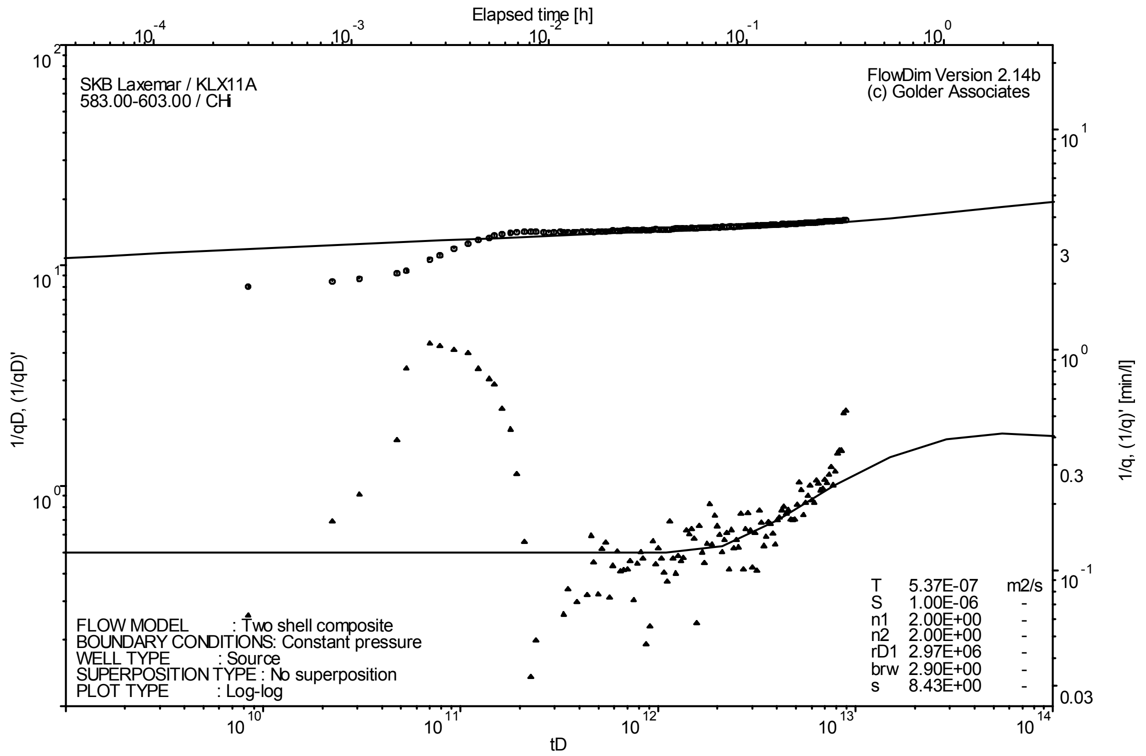
Analysis diagrams



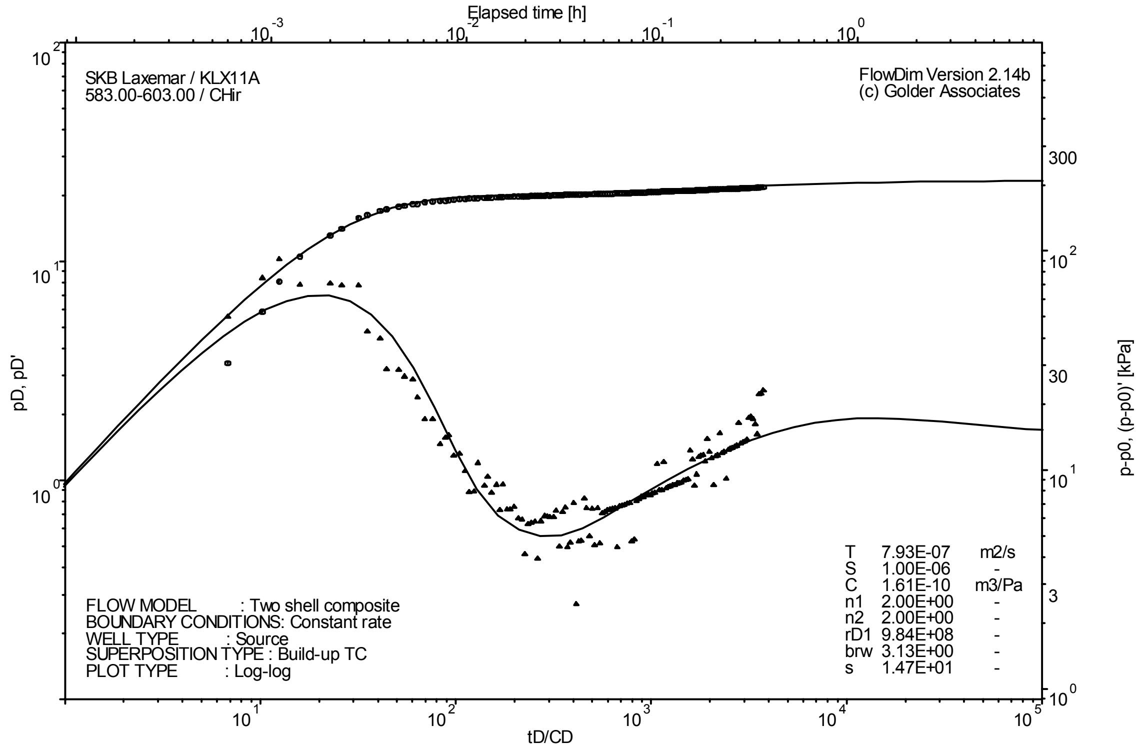
Pressure and flow rate vs. time; cartesian plot



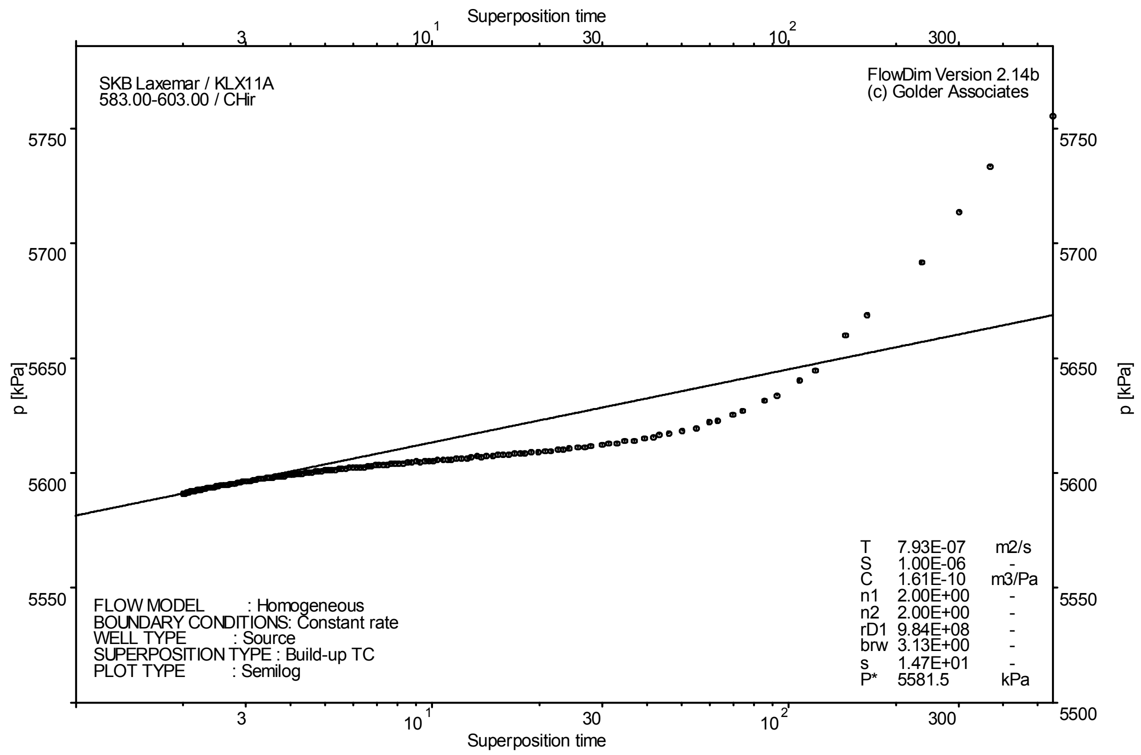
Interval pressure and temperature vs. time; cartesian plot



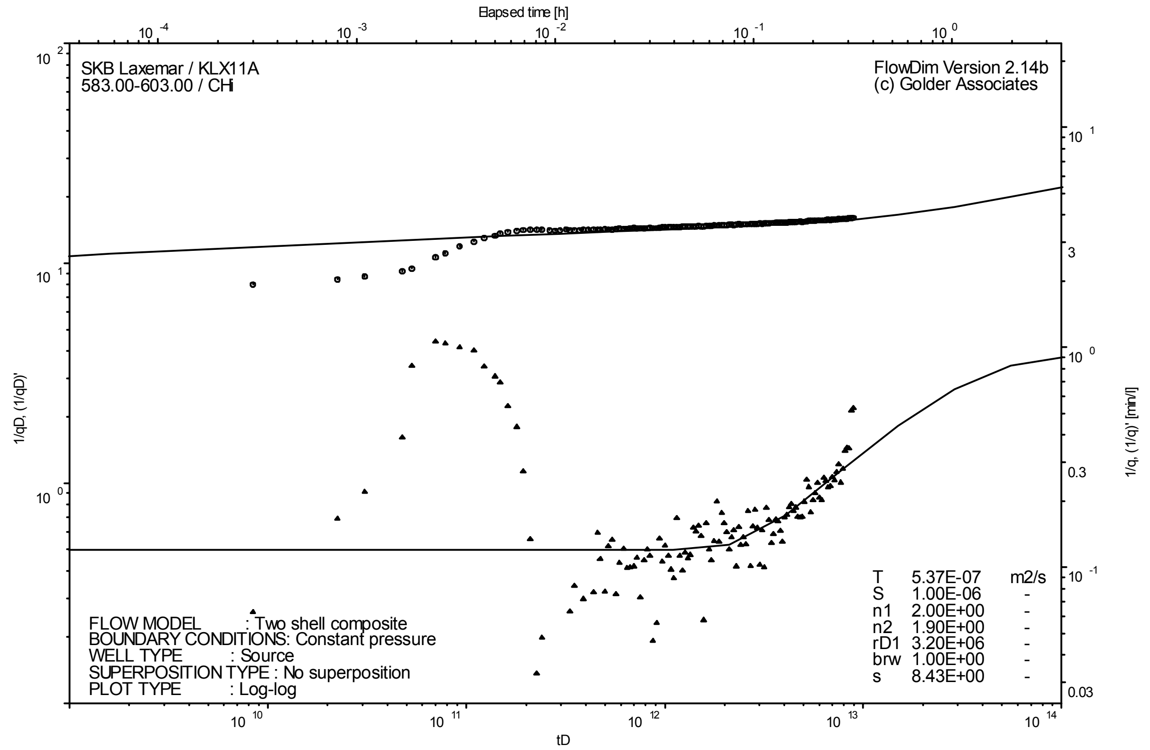
CHI phase; log-log match



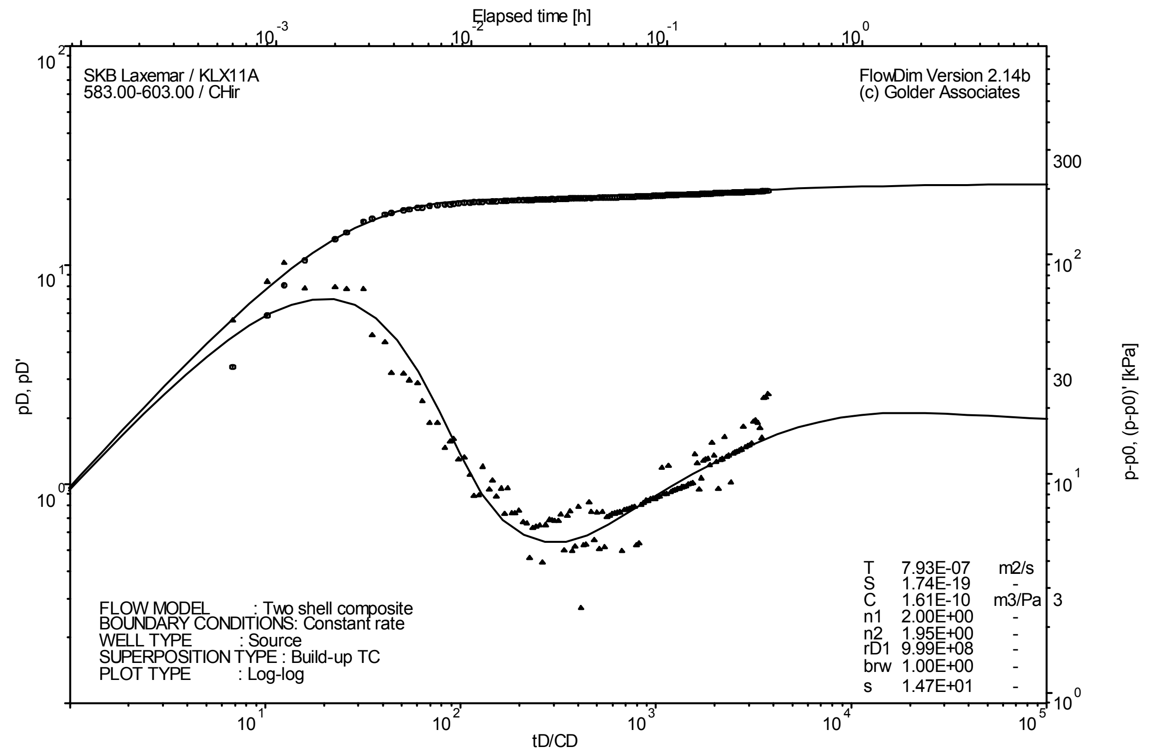
CHIR phase; log-log match



CHIR phase; HORNER match



CHI phase; log-log match (n1=2, n2=1.9)

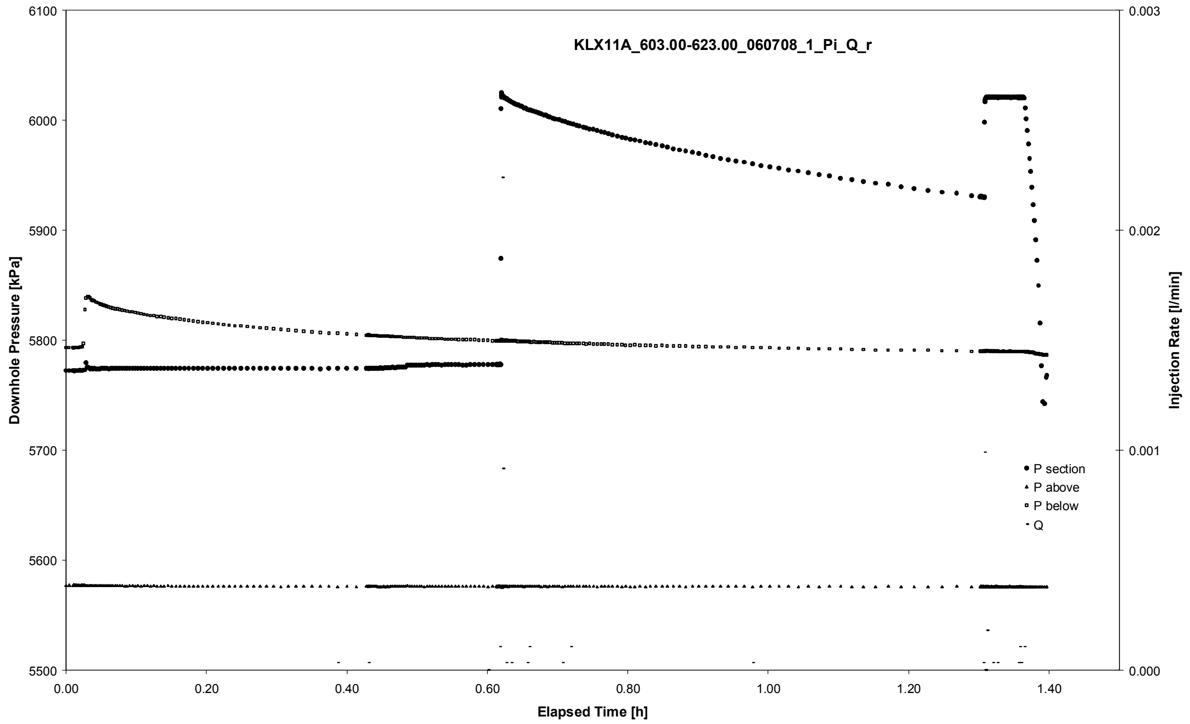


CHIR phase; log-log match (n1=2, n2=1.95)

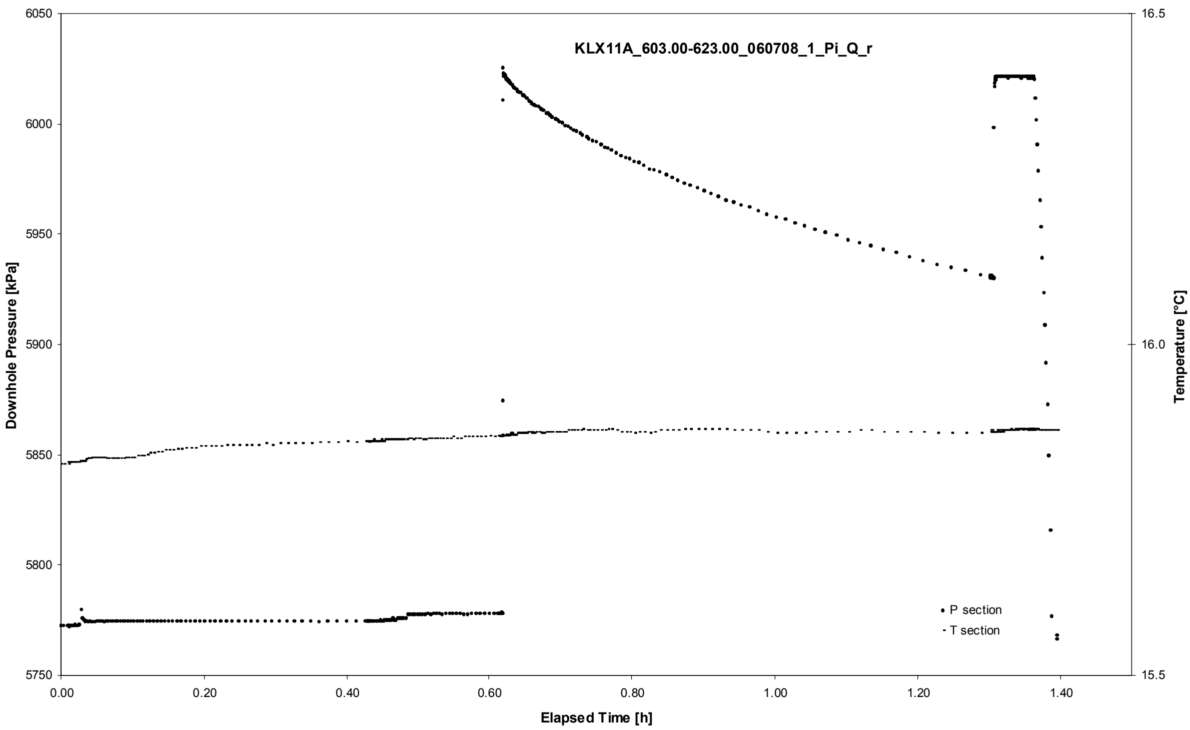
APPENDIX 2-35

Test 603.00 – 623.00 m

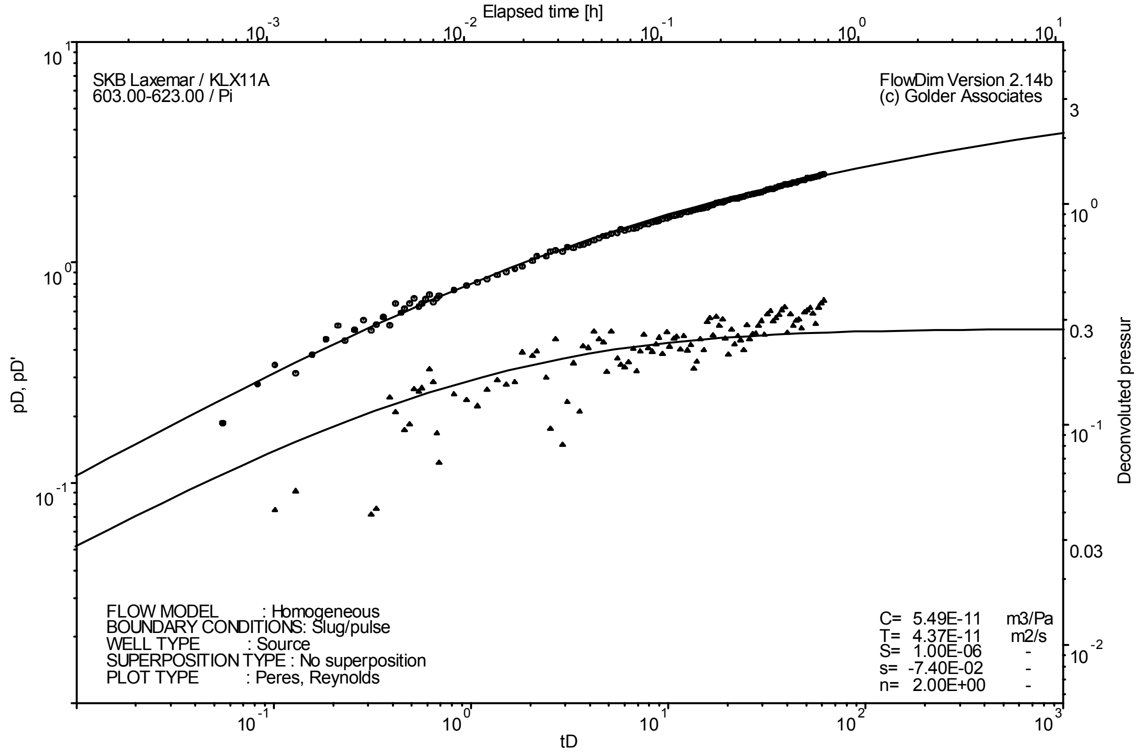
Analysis diagrams



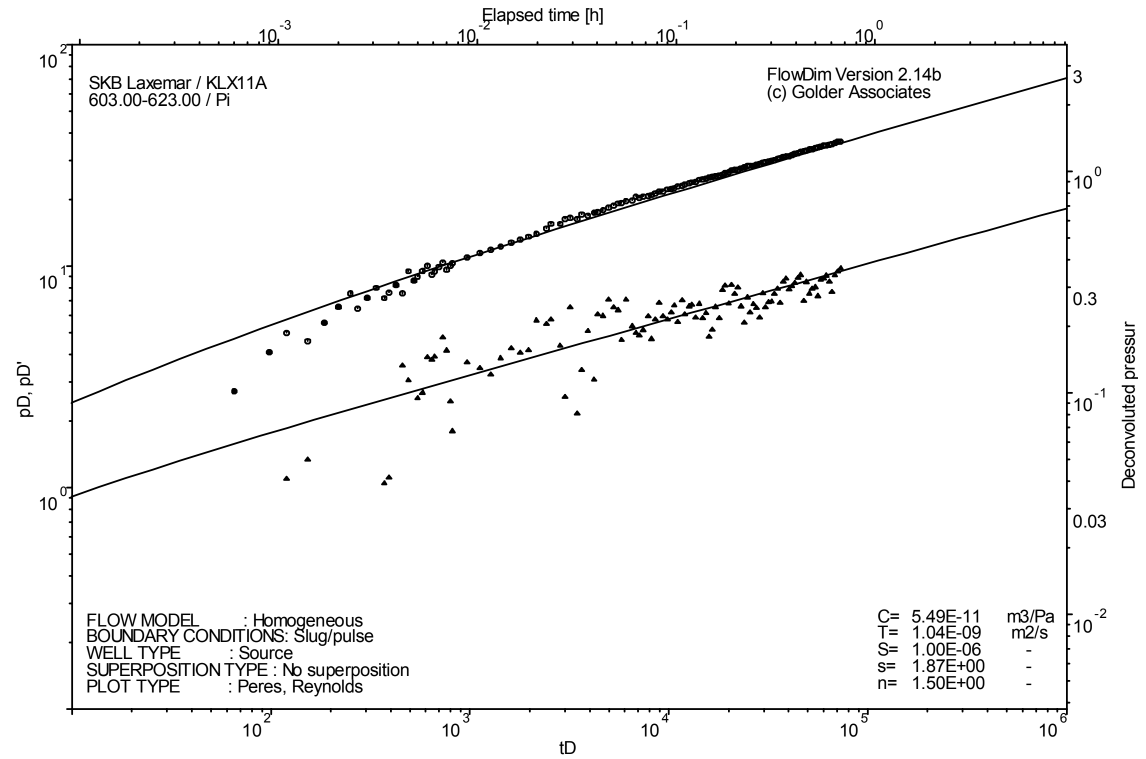
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



Pulse injection; deconvolution match

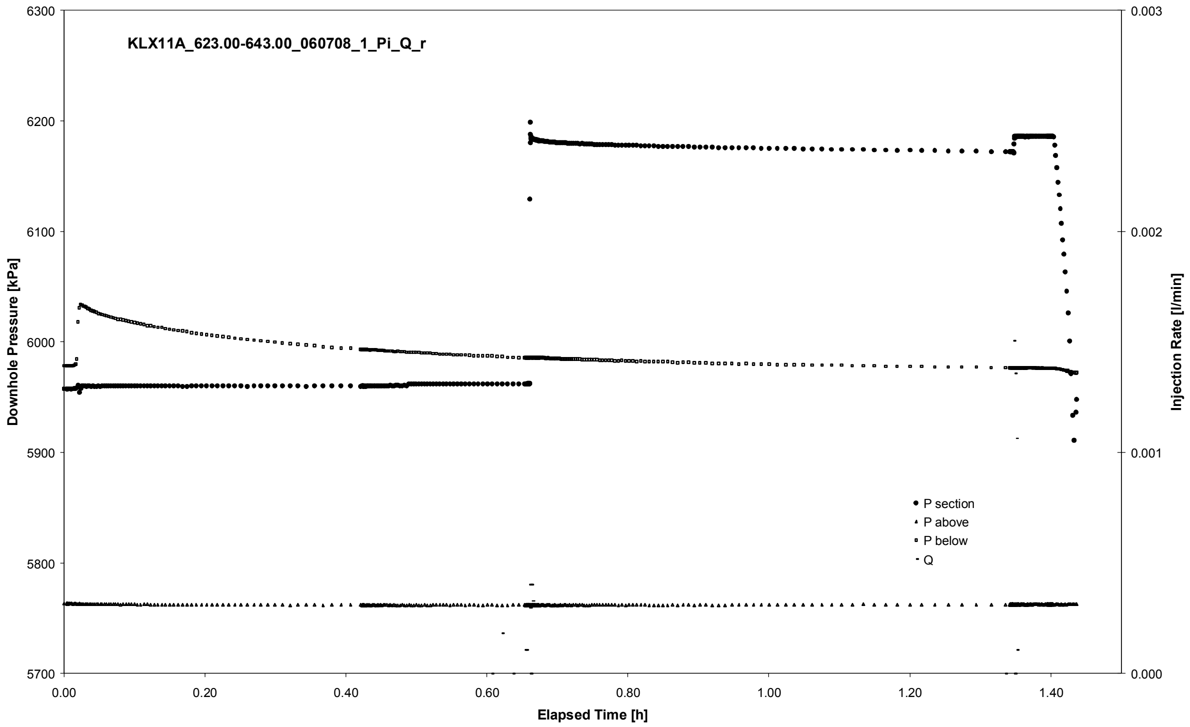


Pulse injection; deconvolution match (n=1.5)

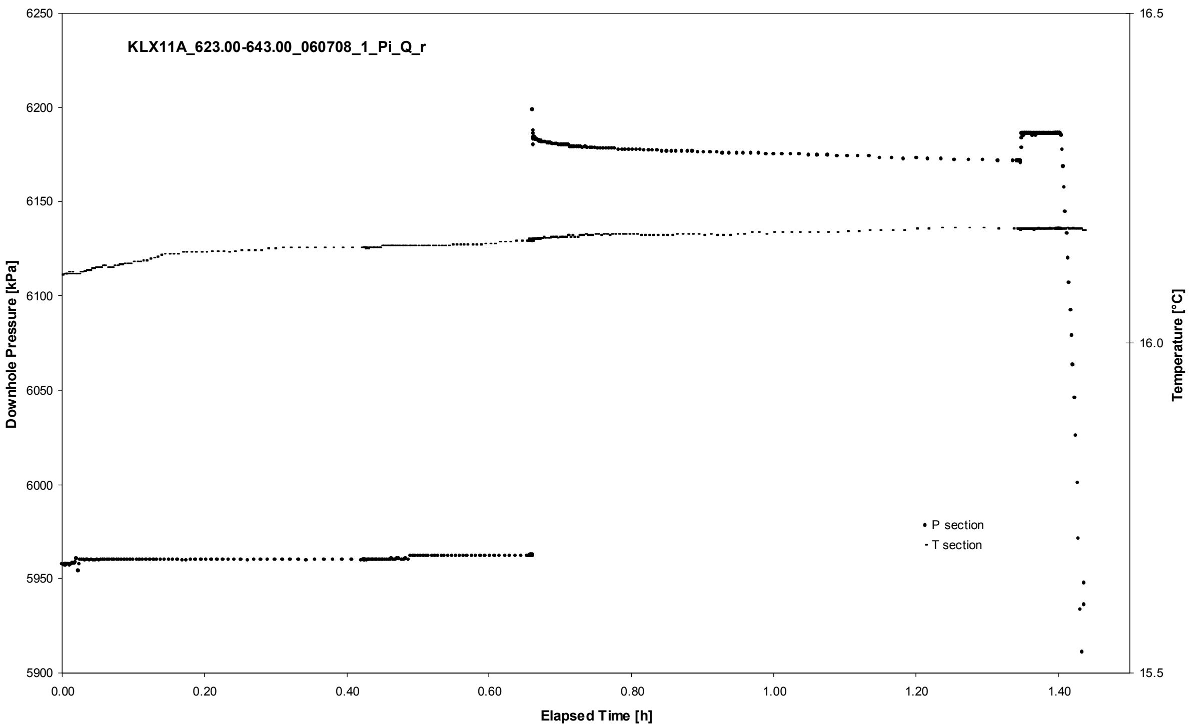
APPENDIX 2-36

Test 623.00 – 643.00 m

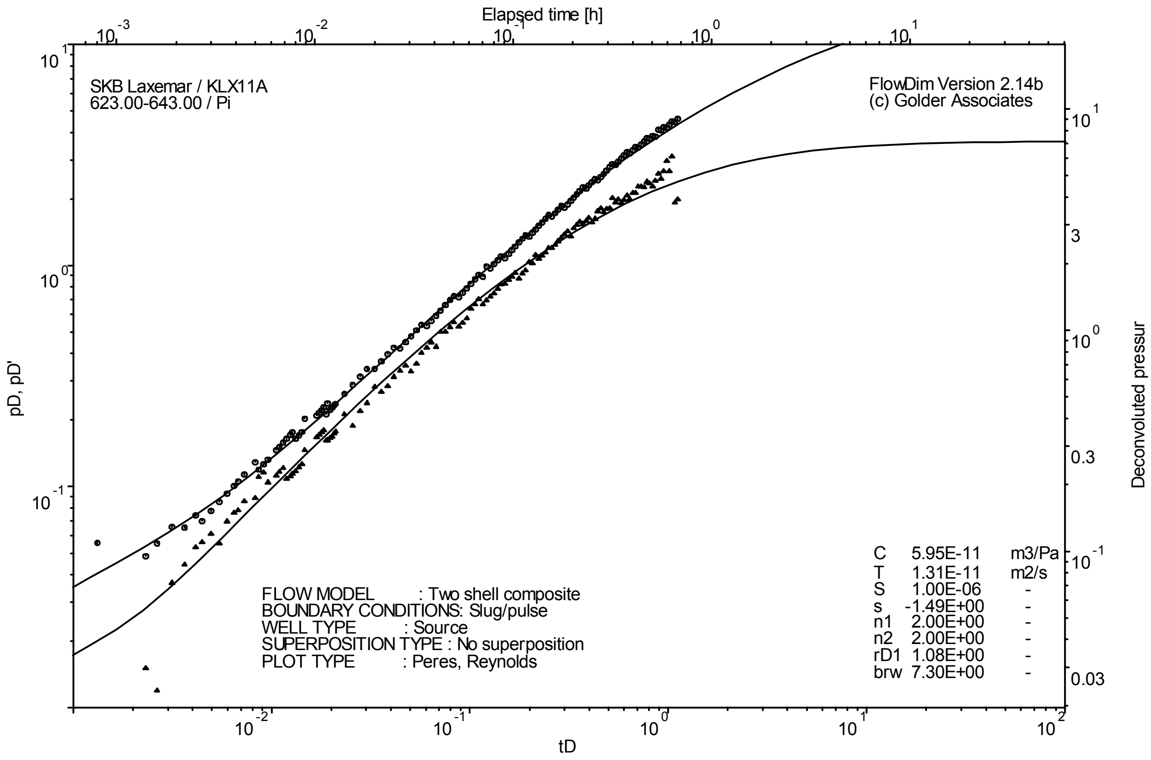
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

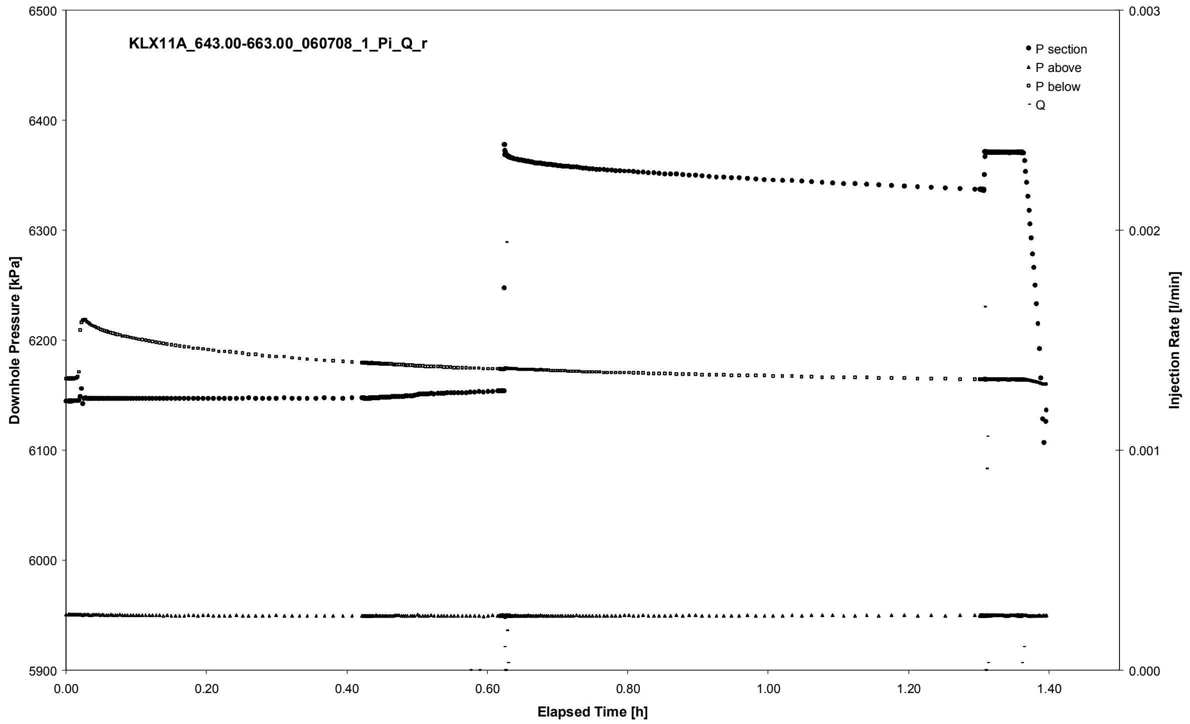


Pulse injection; deconvolution match

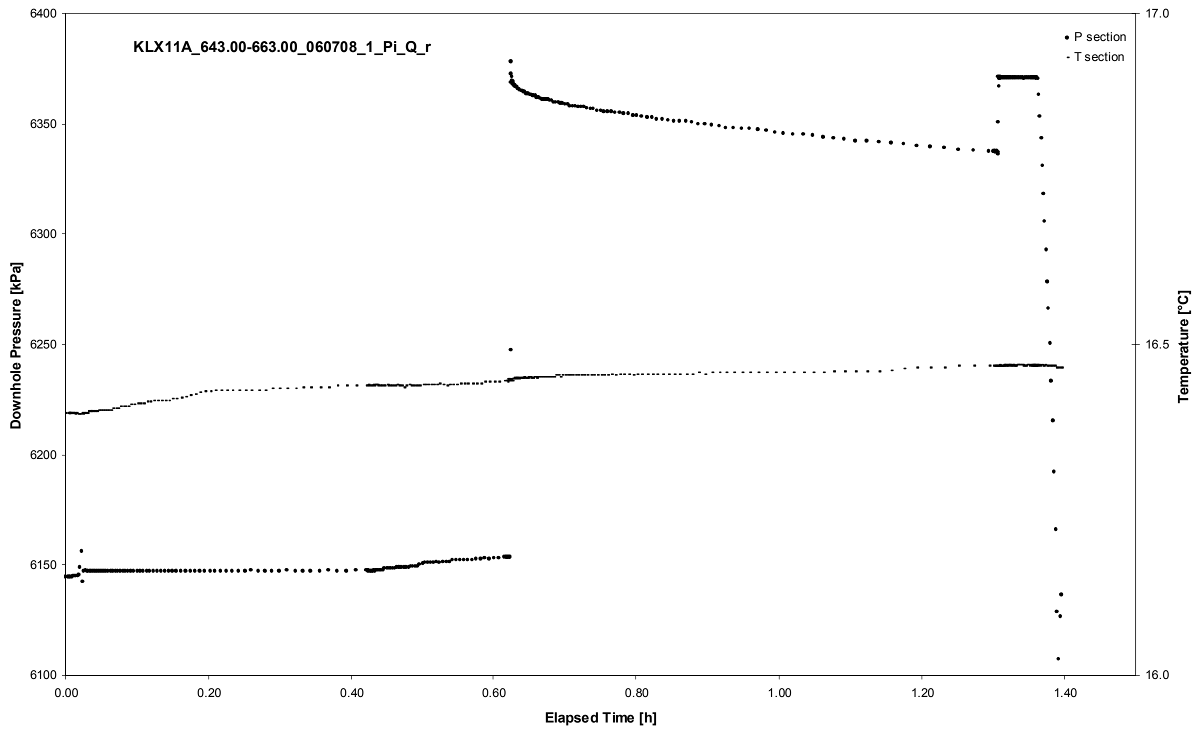
APPENDIX 2-37

Test 643.00 – 663.00 m

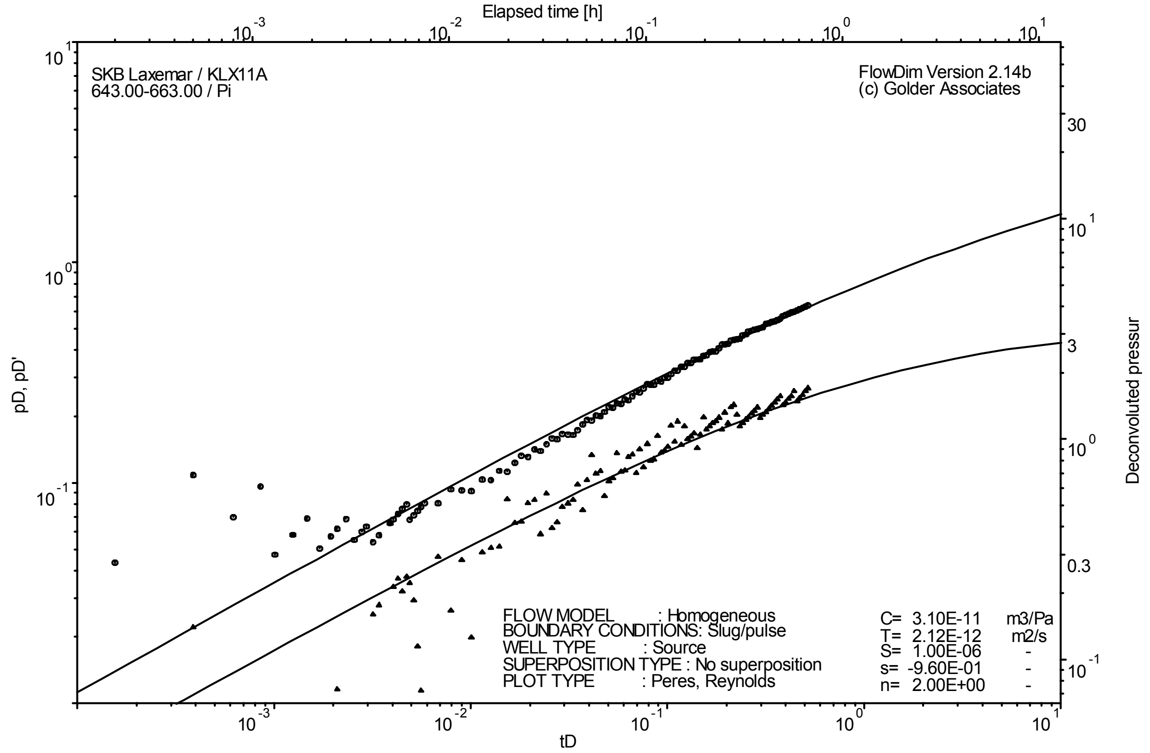
Analysis diagrams



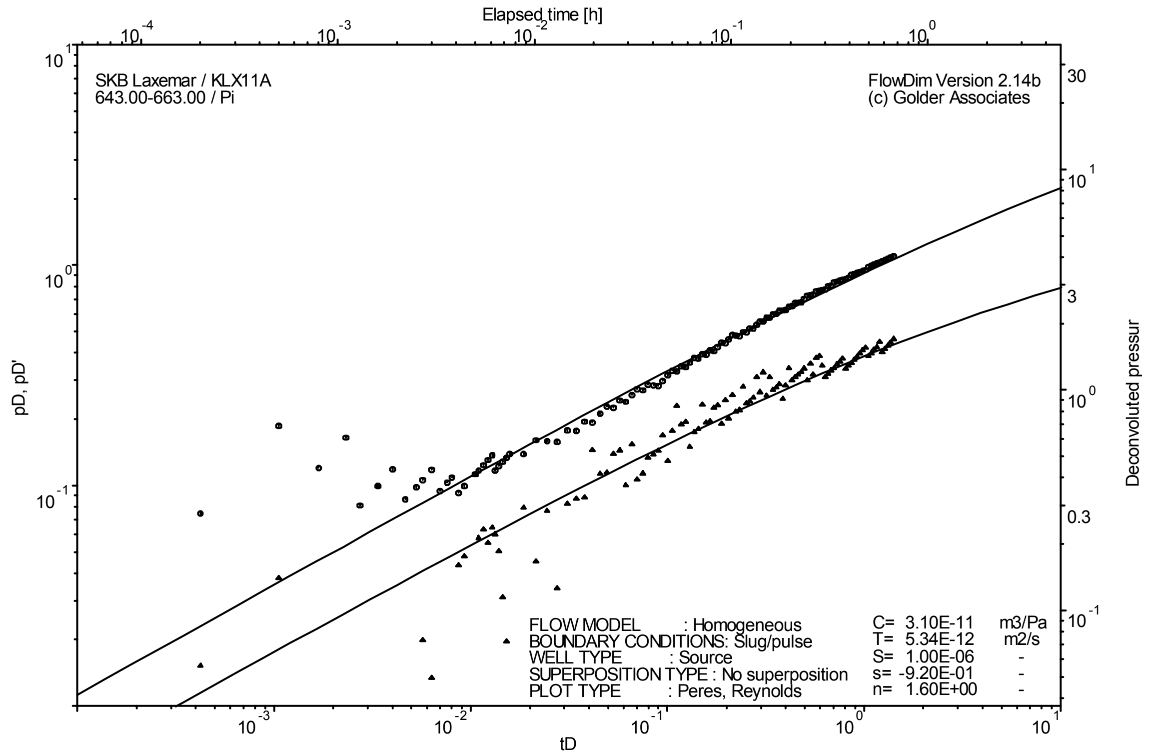
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



Pulse injection; deconvolution match

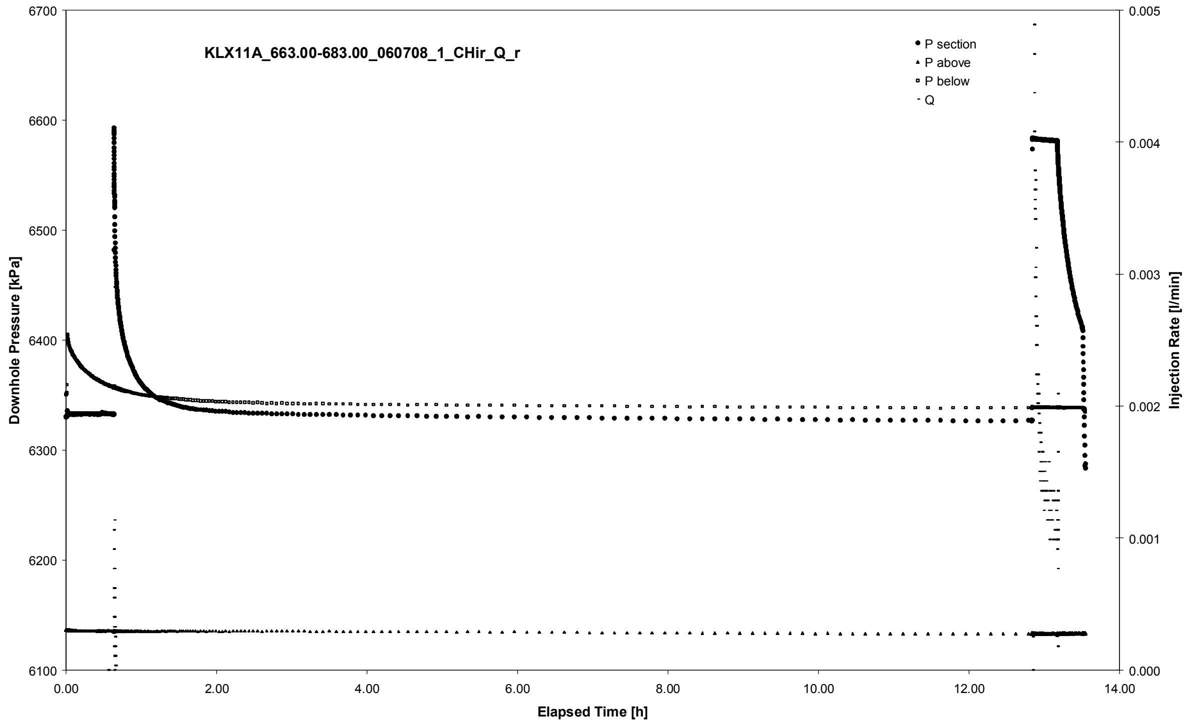


Pulse injection; deconvolution match (n=1.6)

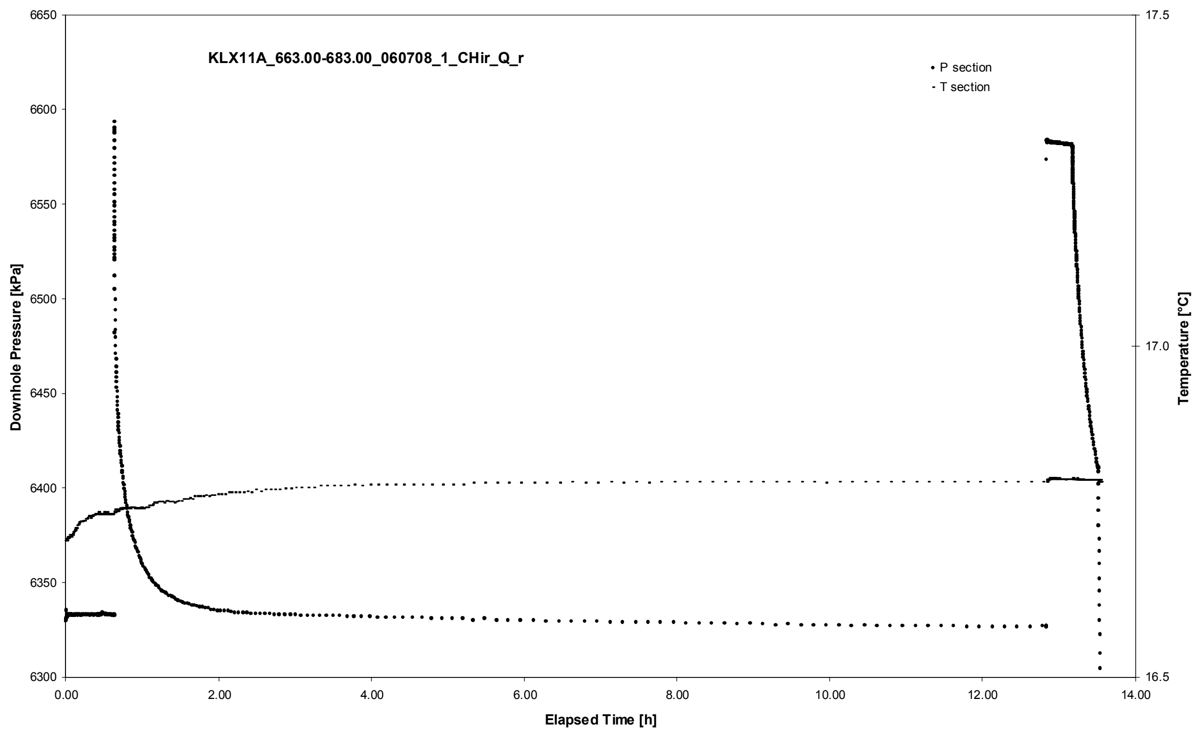
APPENDIX 2-38

Test 663.00 – 683.00 m

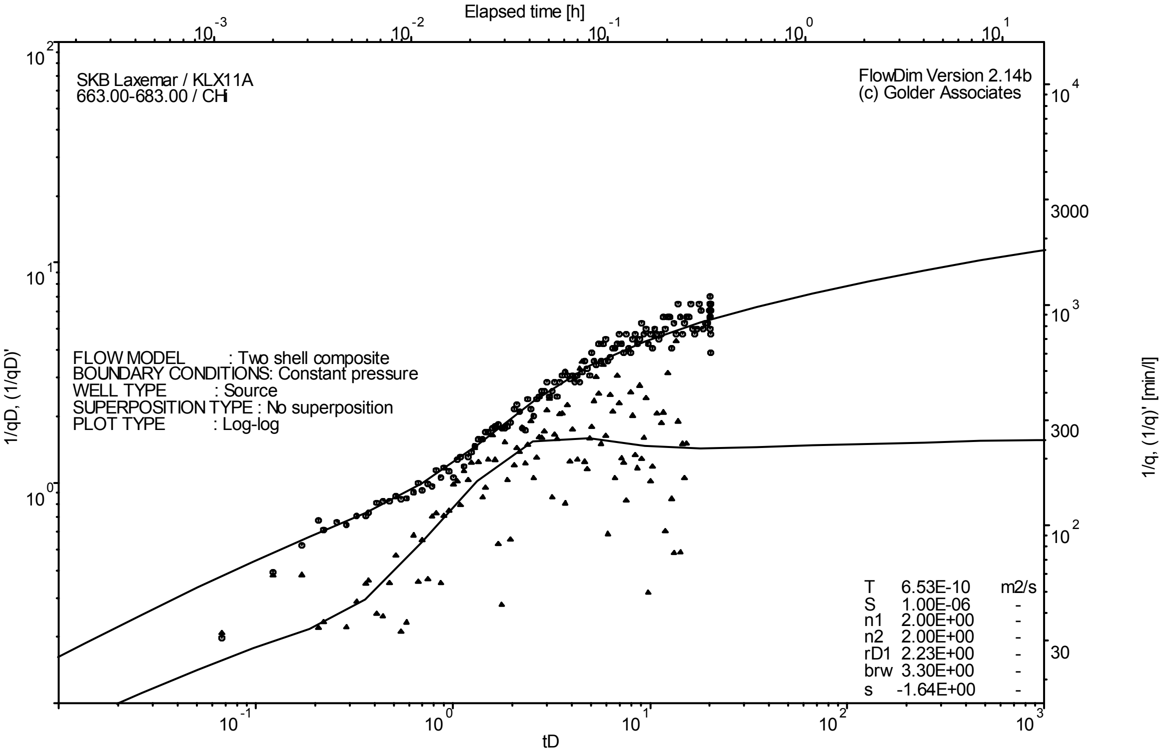
Analysis diagrams



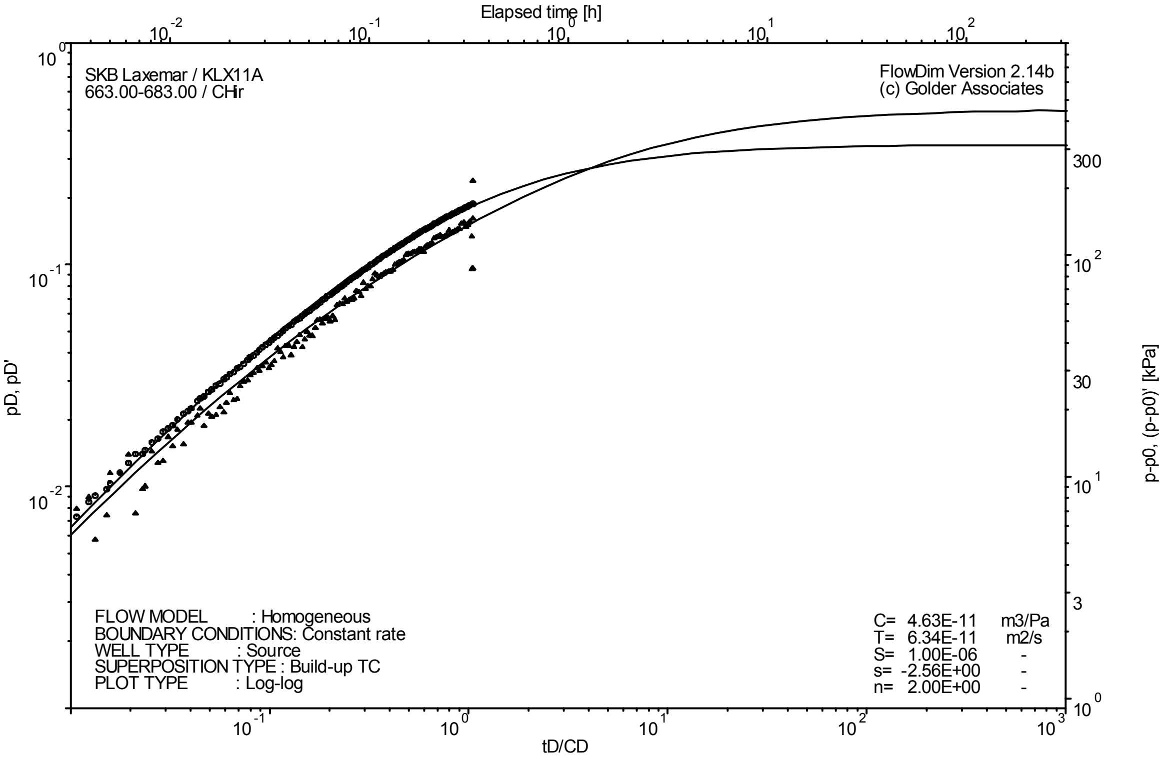
Pressure and flow rate vs. time; cartesian plot



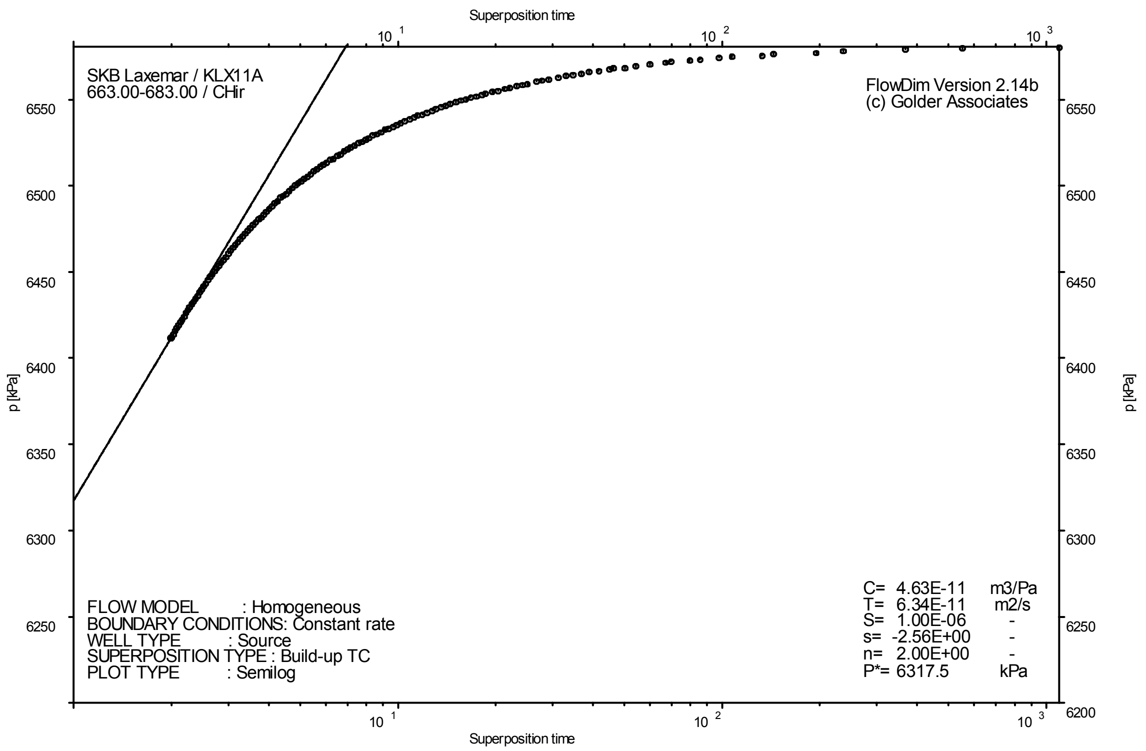
Interval pressure and temperature vs. time; cartesian plot



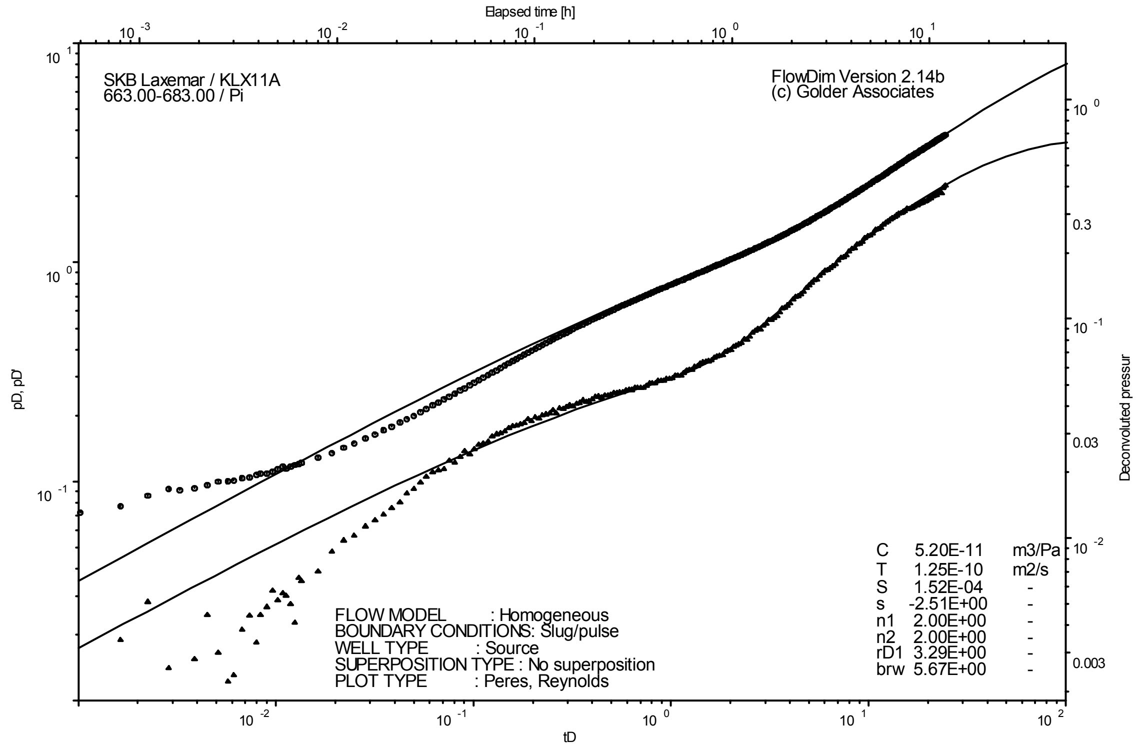
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

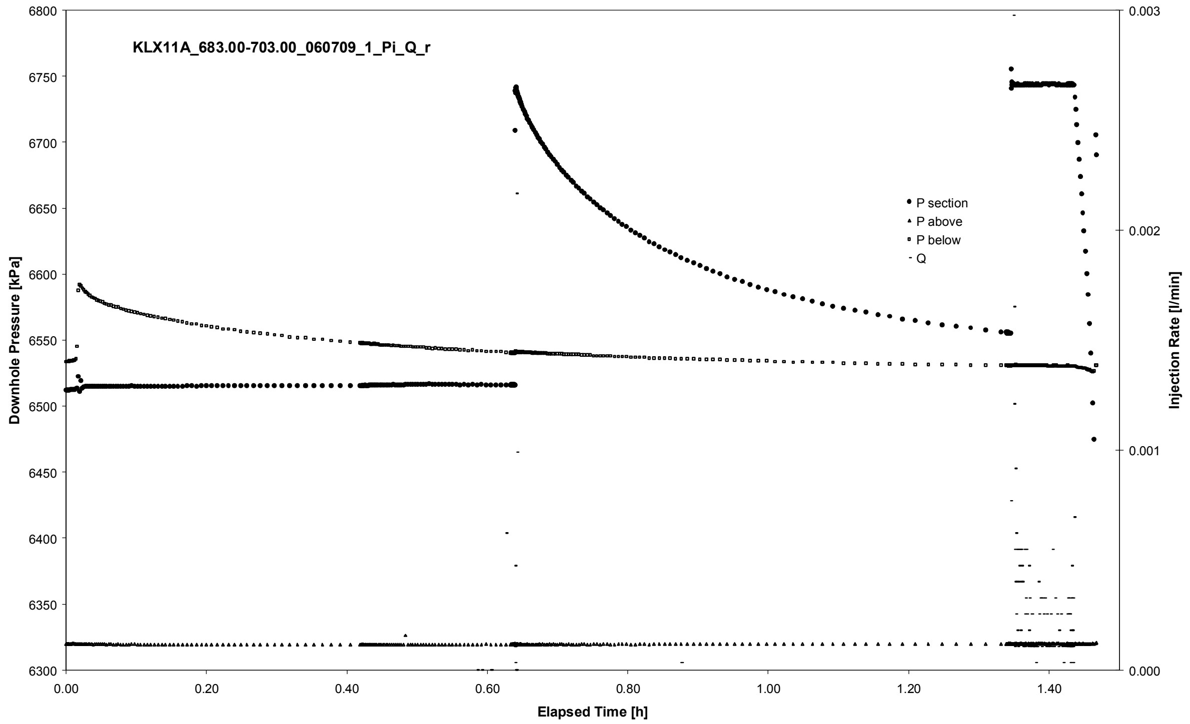


Pulse injection; deconvolution match

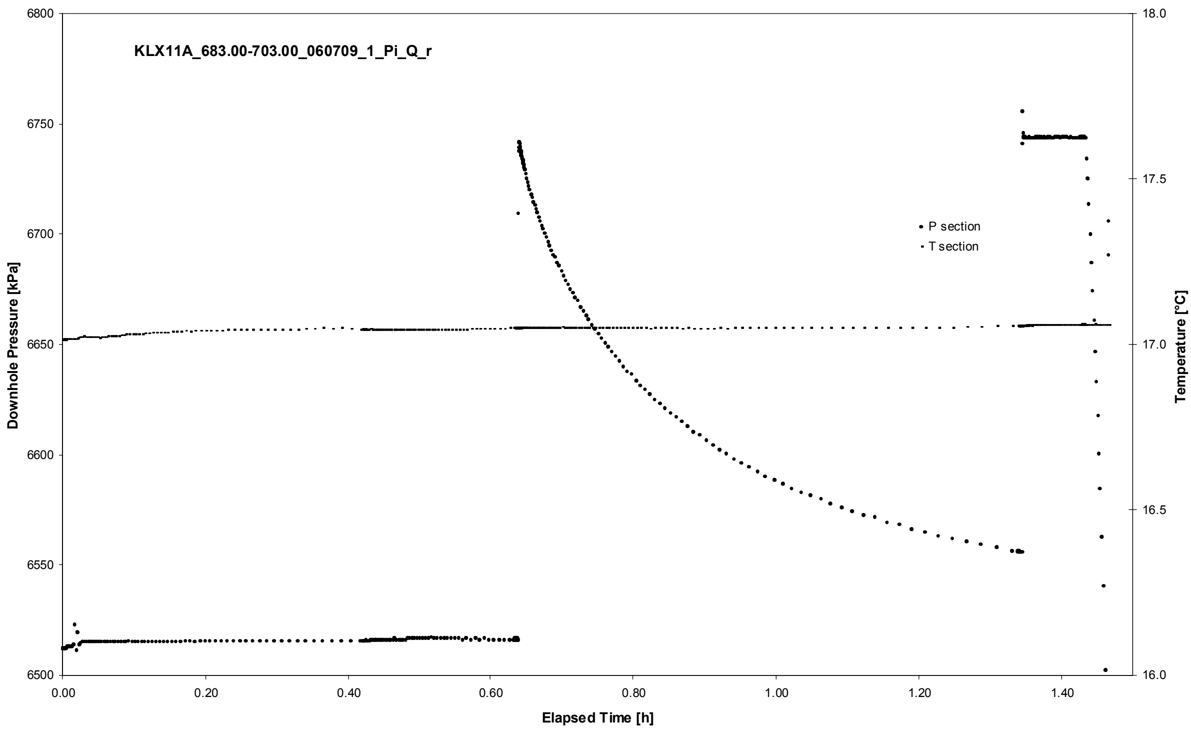
APPENDIX 2-39

Test 683.00 – 703.00 m

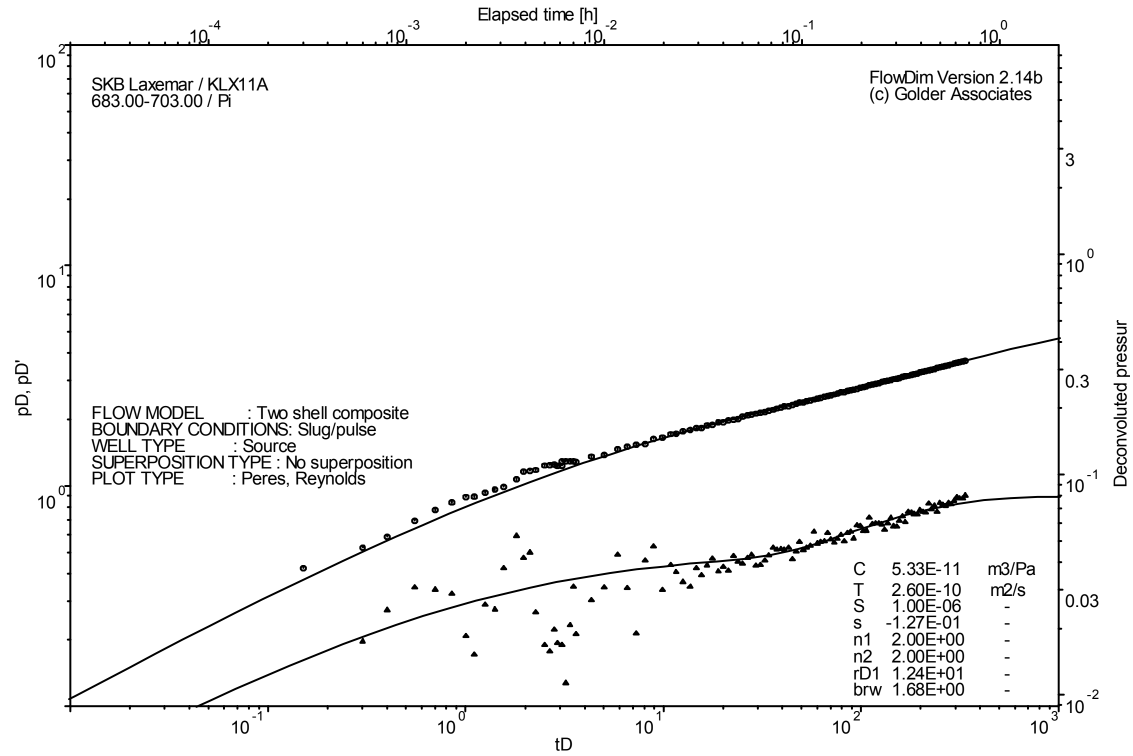
Analysis diagrams



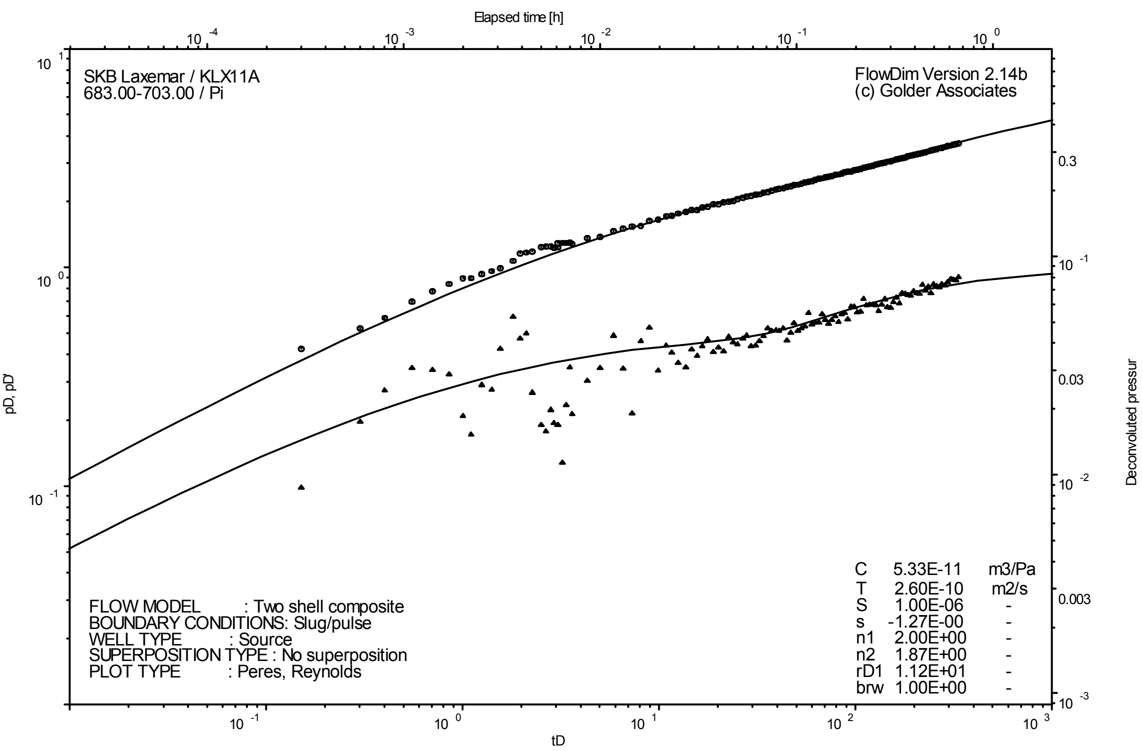
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



Pulse injection; deconvolution match

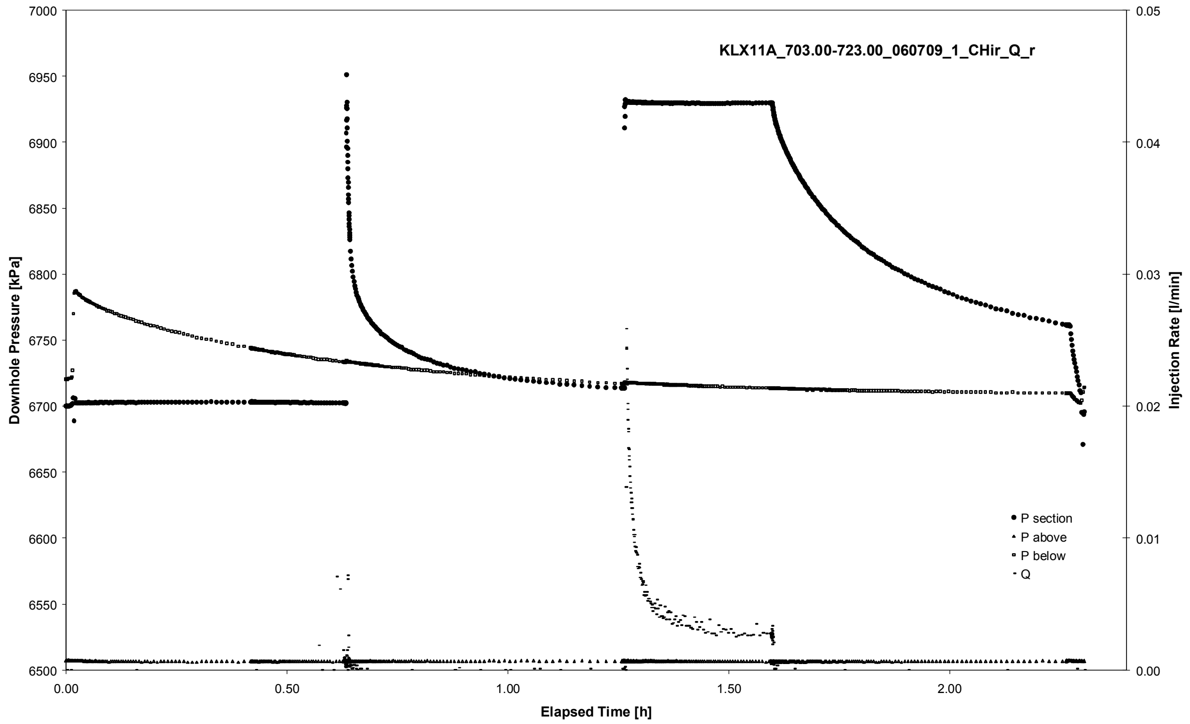


Pulse injection; deconvolution match (n1=2, n2=1.87)

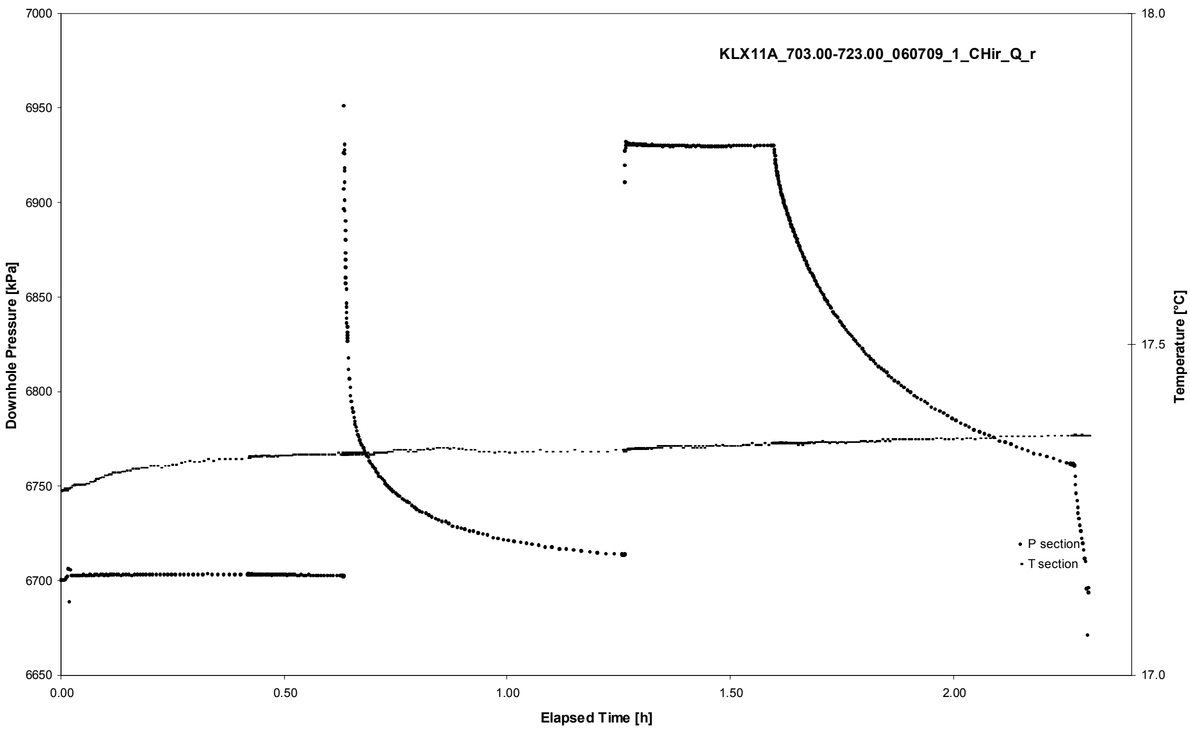
APPENDIX 2-40

Test 703.00 – 723.00 m

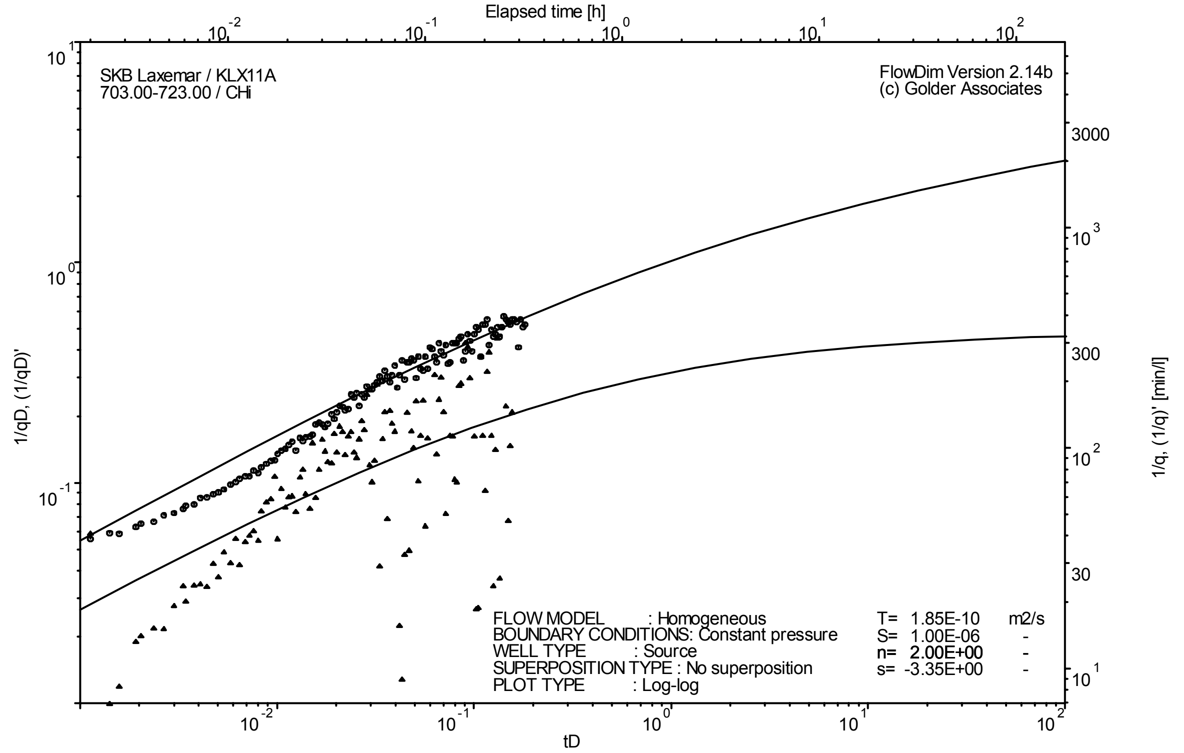
Analysis diagrams



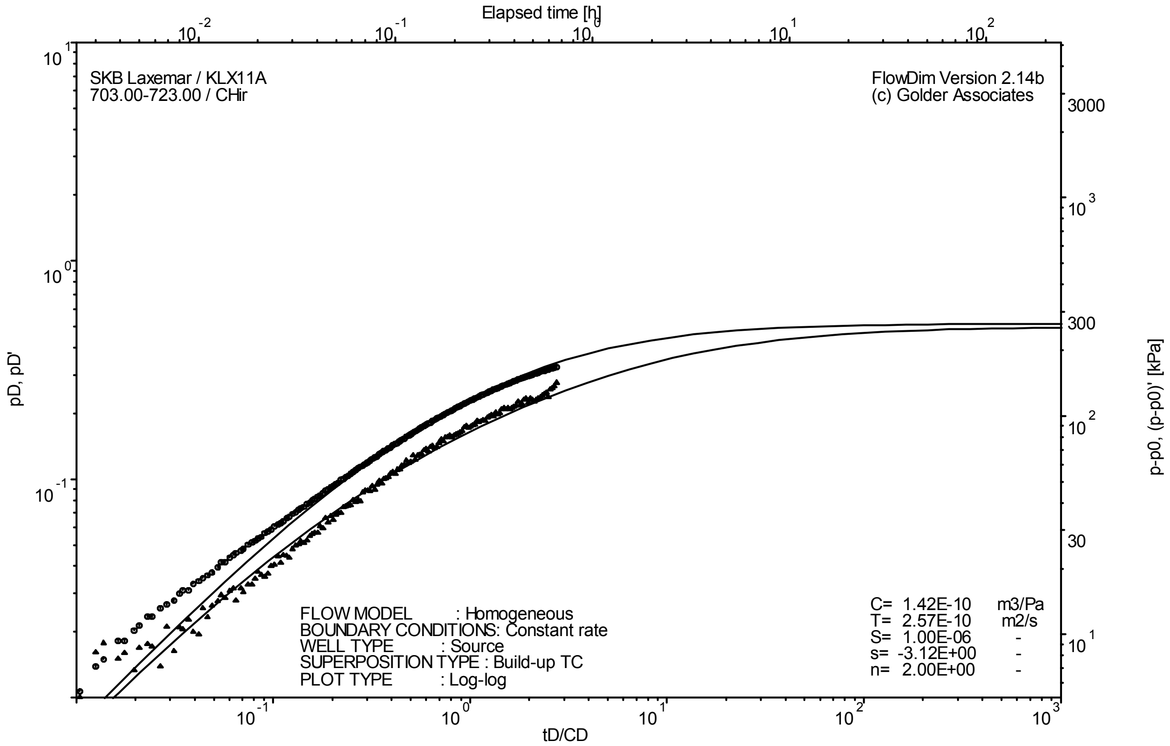
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

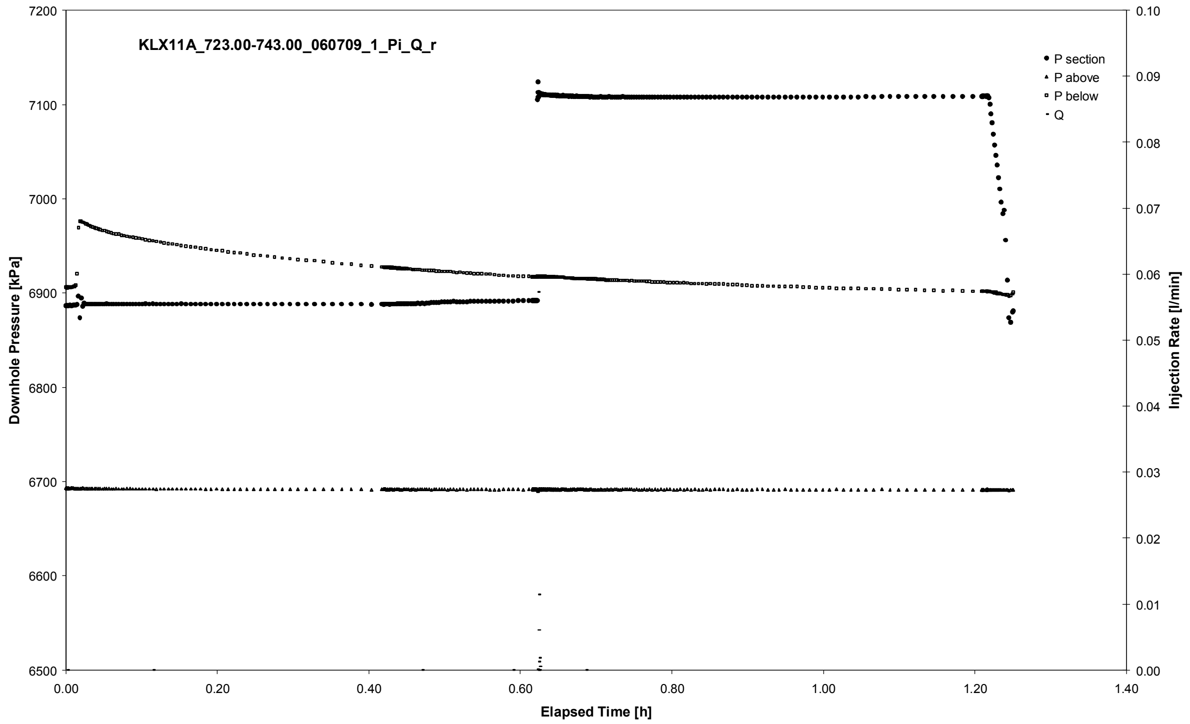
Not analysable

CHIR phase; HORNER match

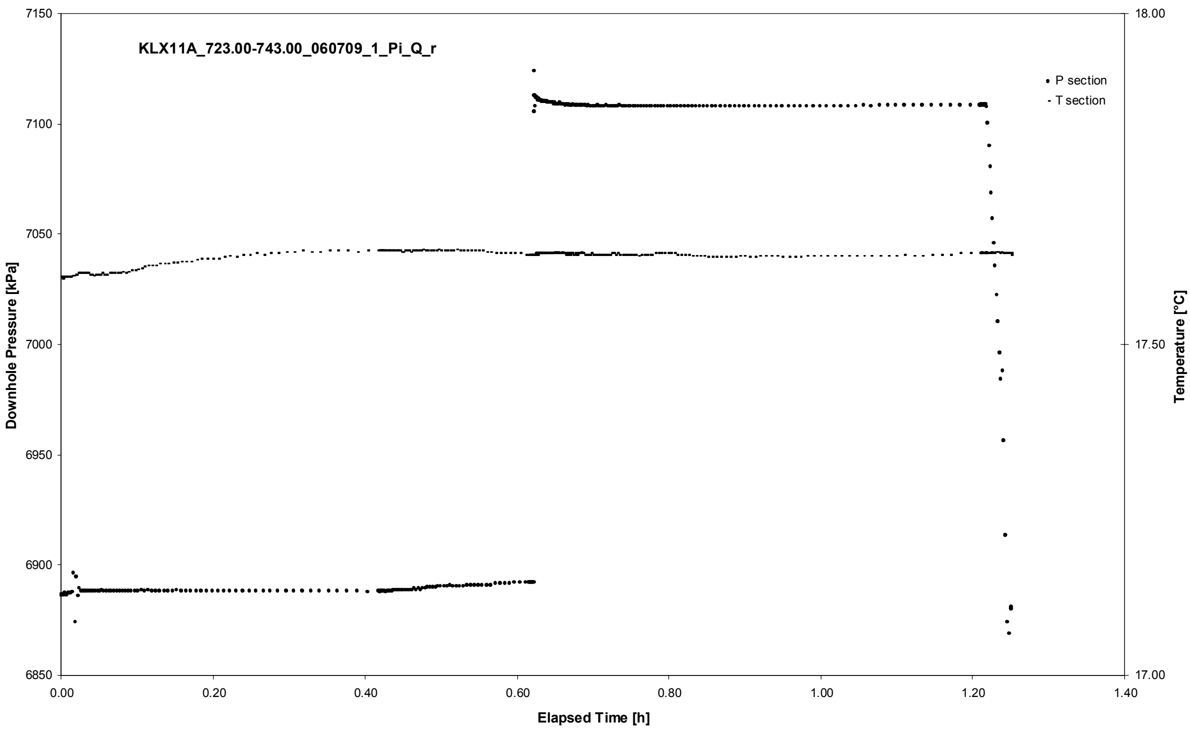
APPENDIX 2-41

Test 723.00 – 743.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

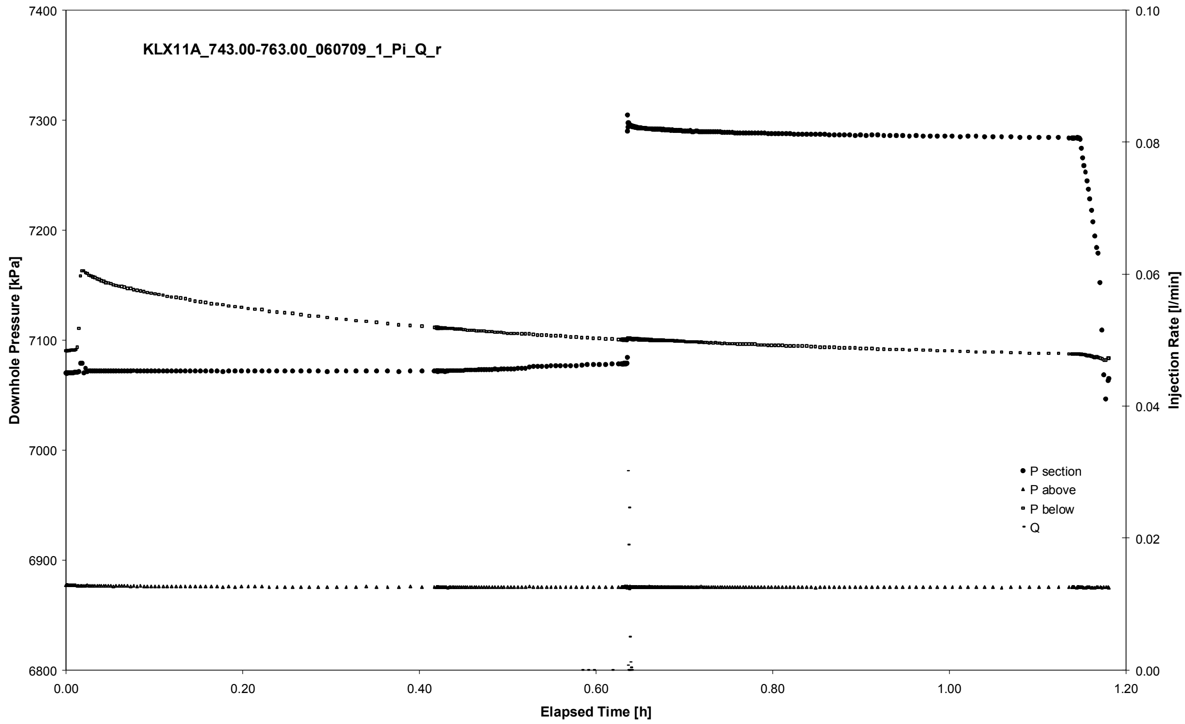
Not analysed

Pulse injection; deconvolution match

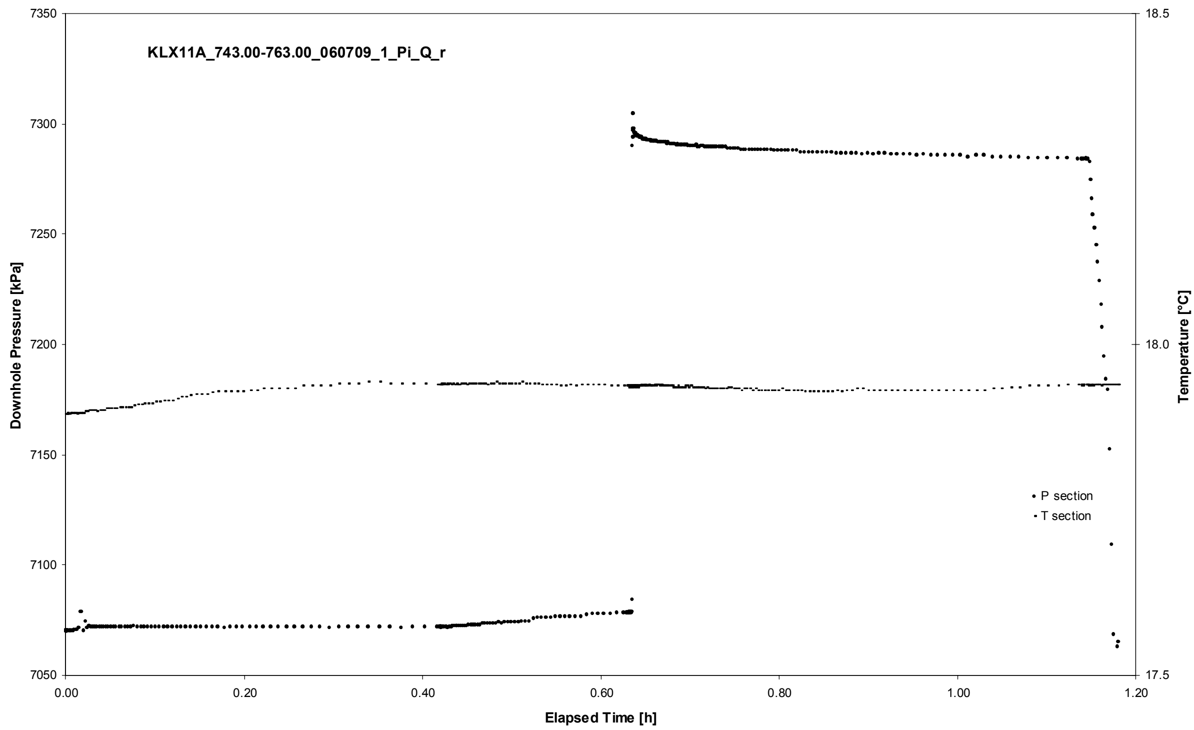
APPENDIX 2-42

Test 743.00 – 763.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

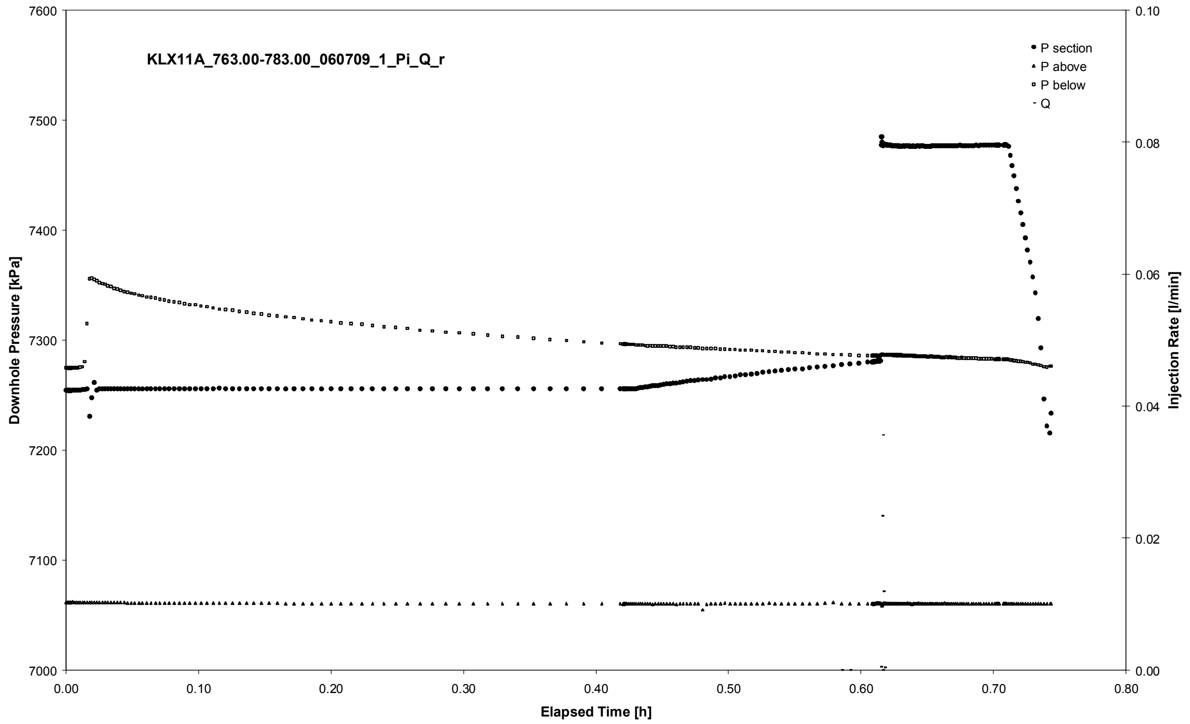
Not analysed

Pulse injection; deconvolution match

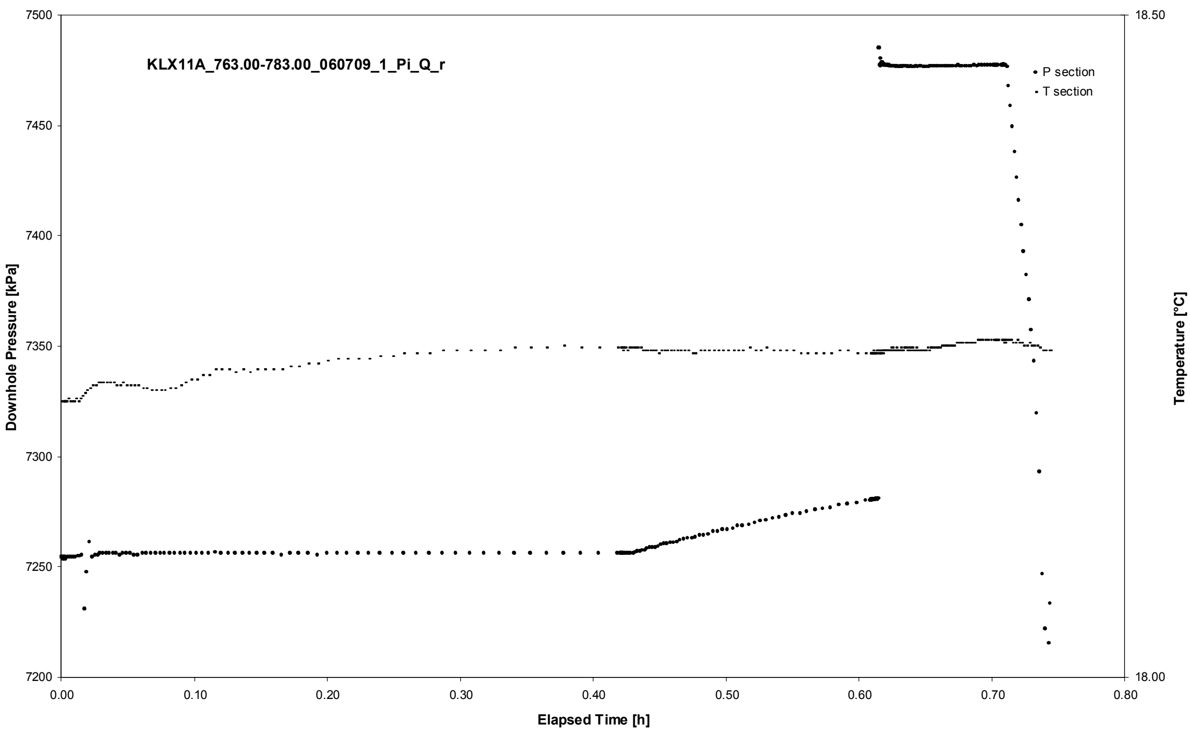
APPENDIX 2-43

Test 763.00 – 783.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

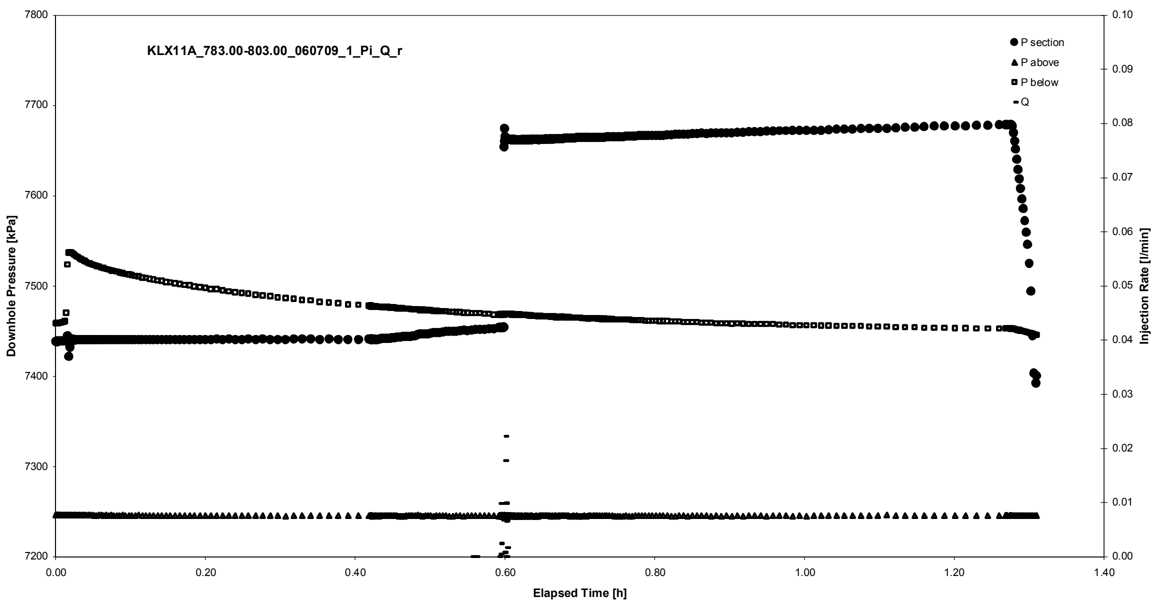
Not analysed

Pulse injection; deconvolution match

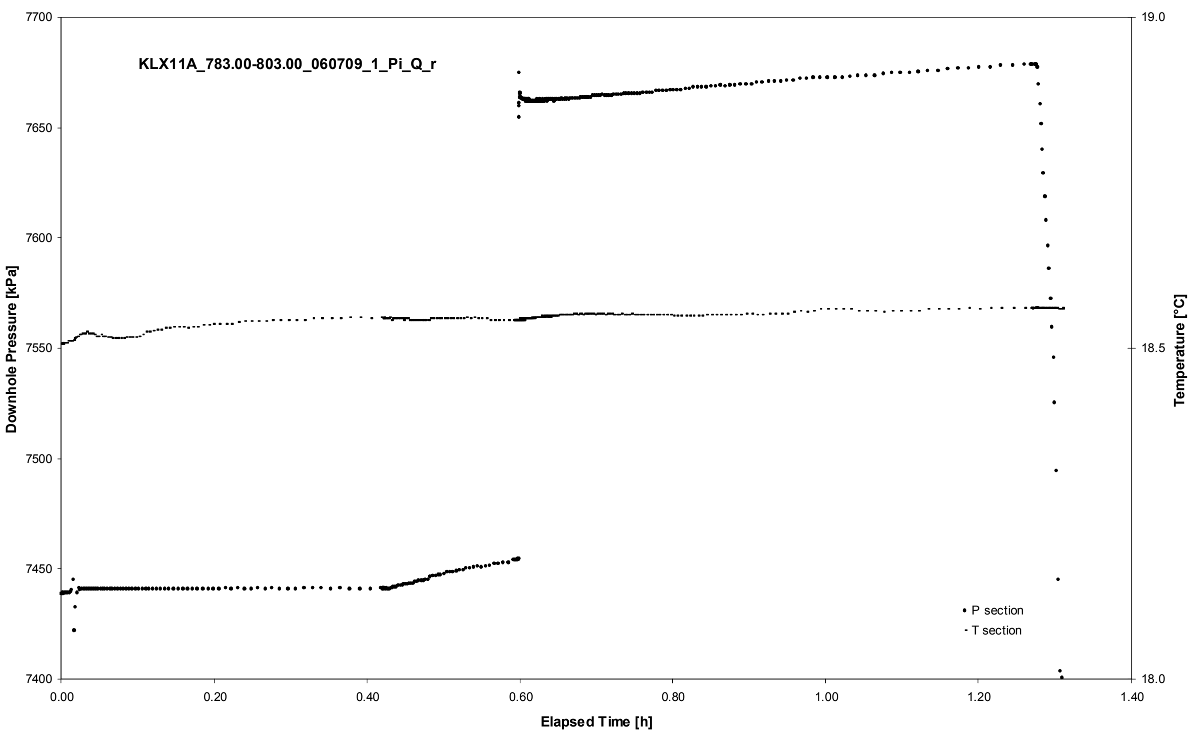
APPENDIX 2-44

Test 783.00 – 803.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

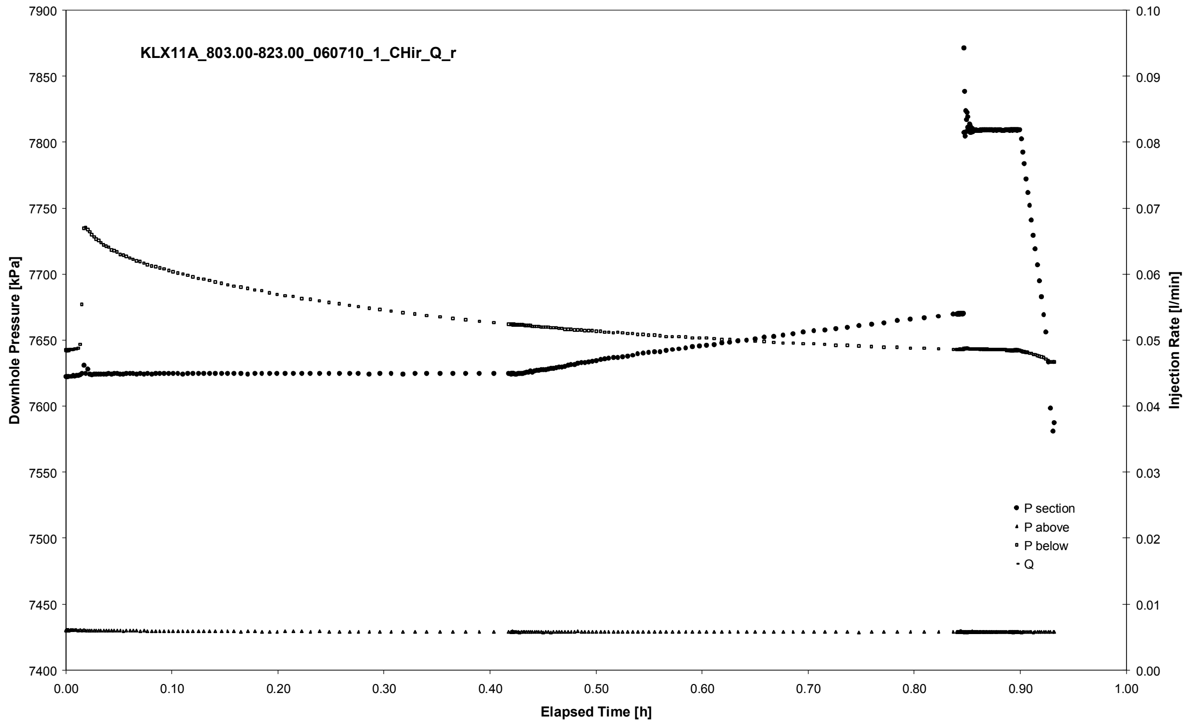
Not analysed

Pulse injection; deconvolution match

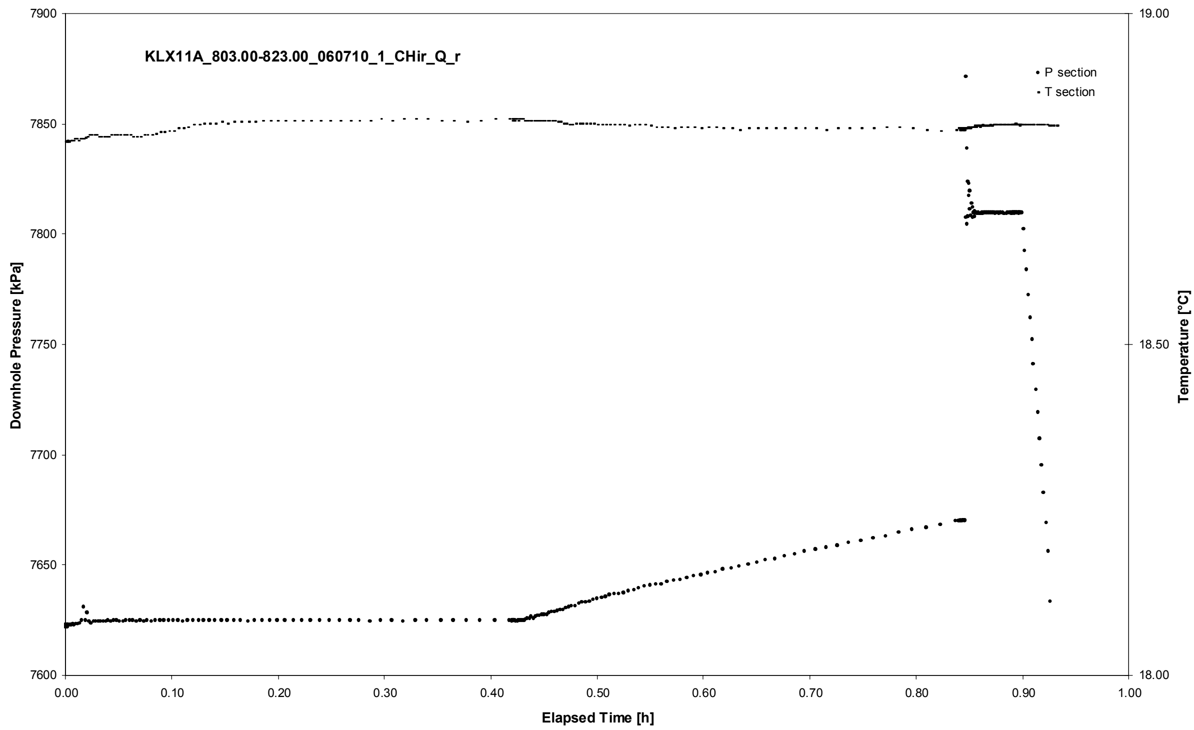
APPENDIX 2-45

Test 803.00 – 823.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

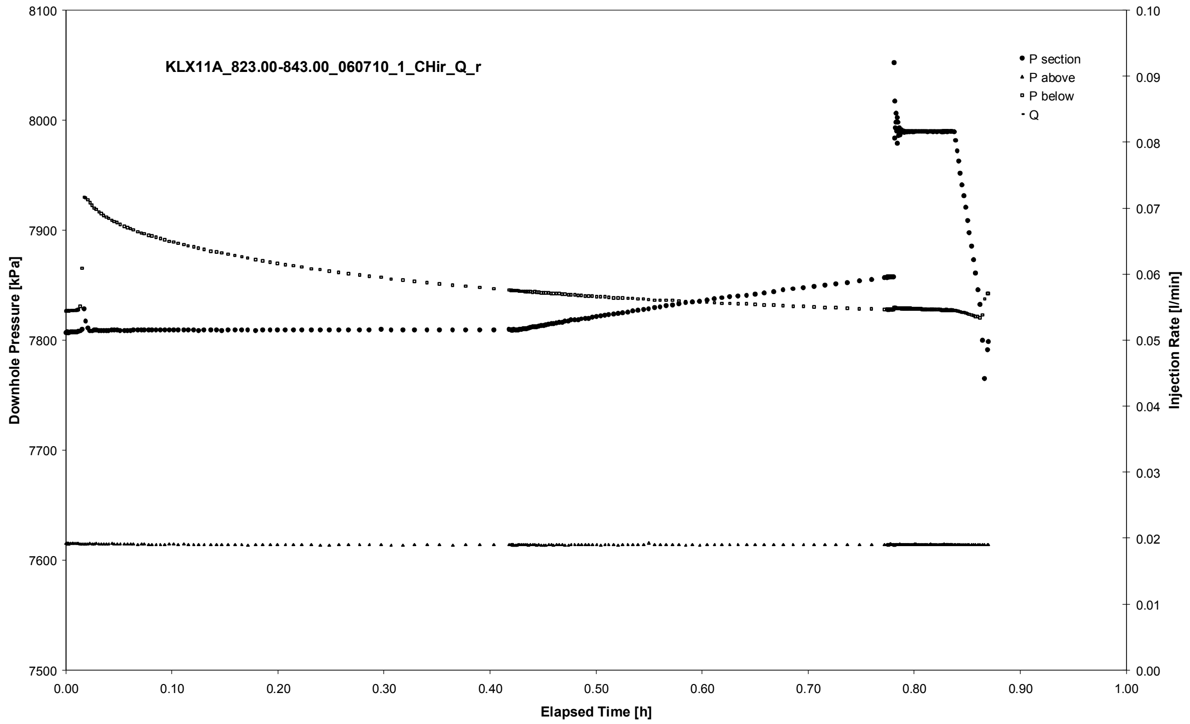
CHIR phase; log-log match

Not analysed

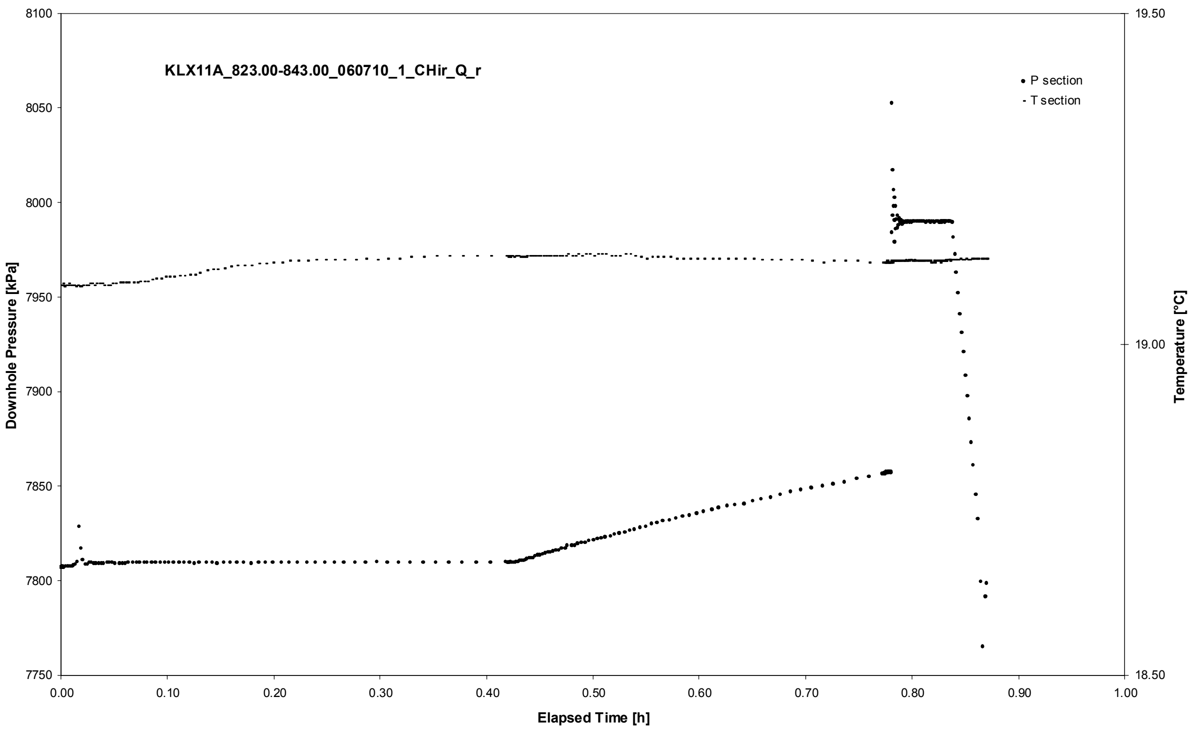
APPENDIX 2-46

Test 823.00 – 843.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

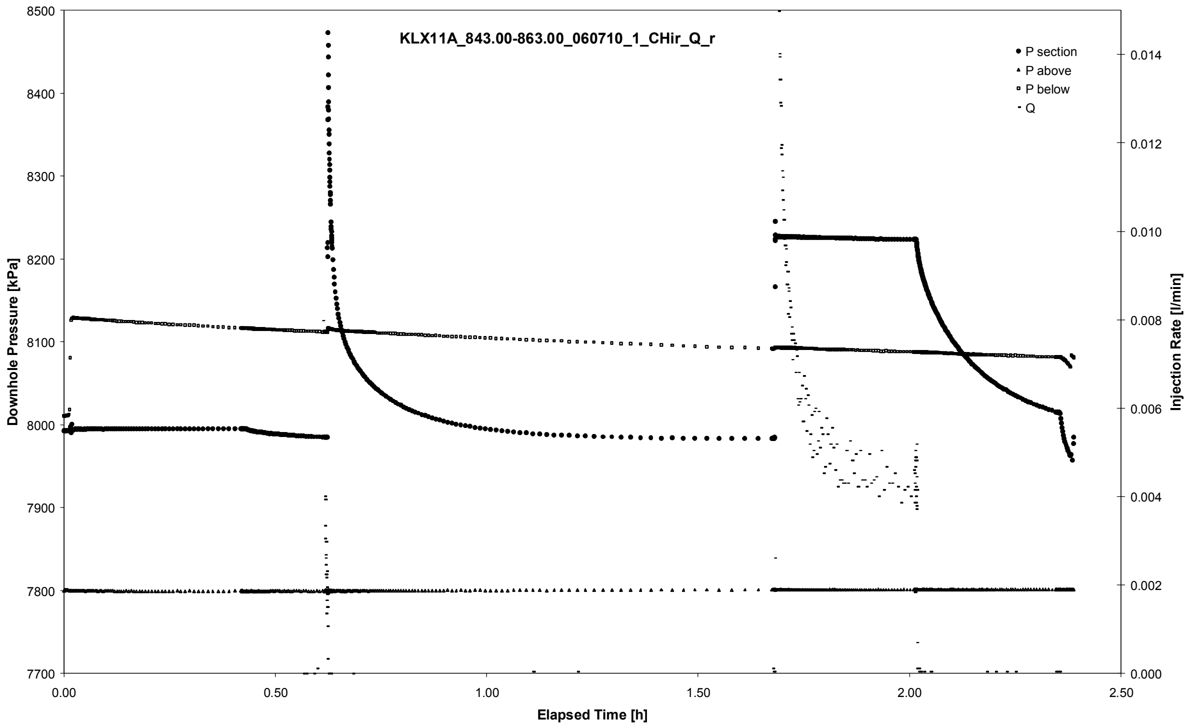
CHIR phase; log-log match

Not analysed

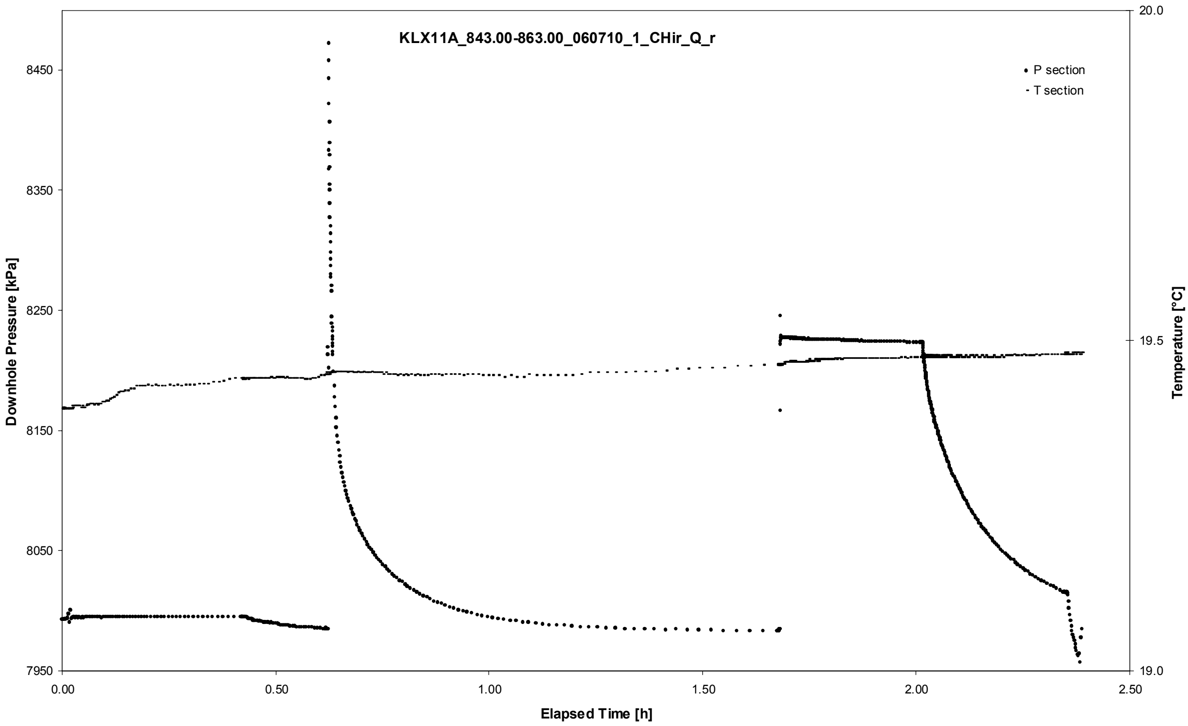
APPENDIX 2-47

Test 843.00 – 863.00 m

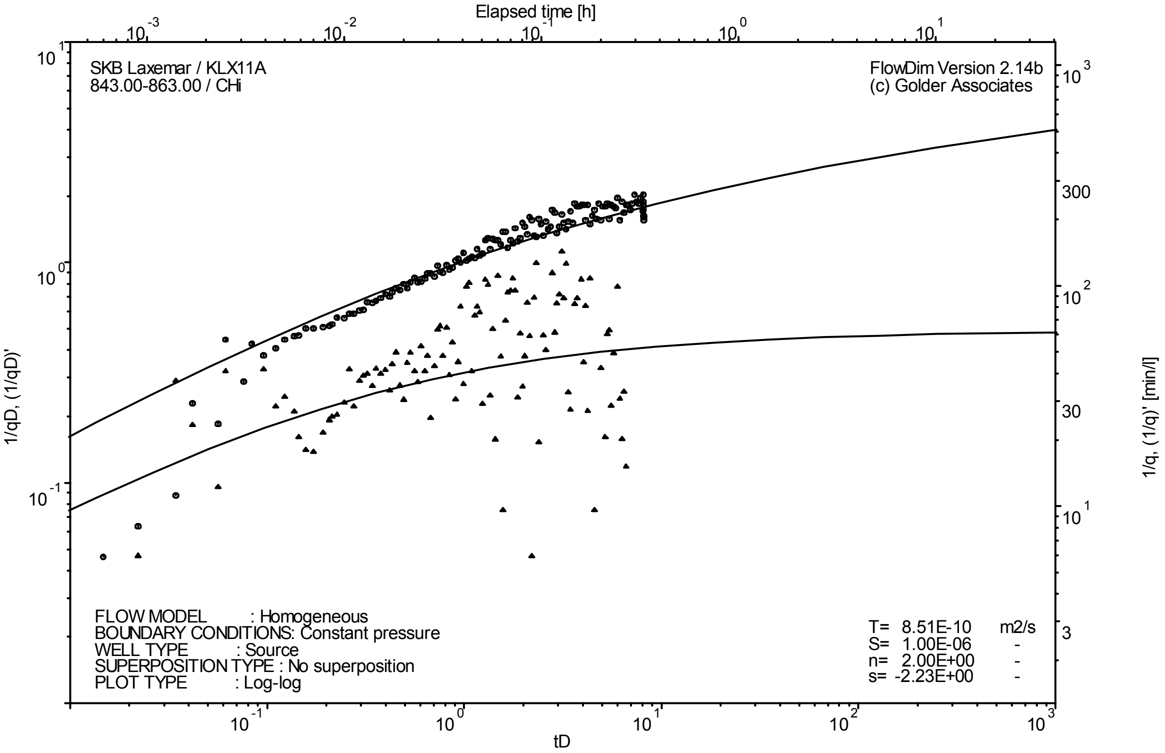
Analysis diagrams



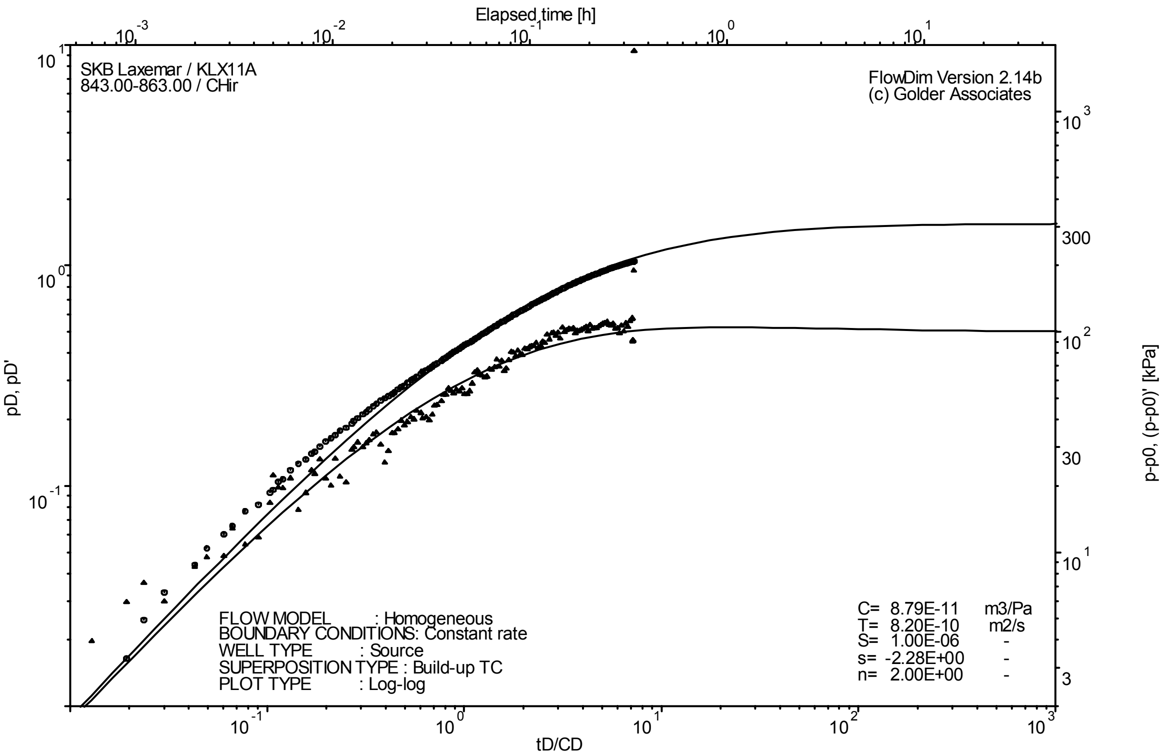
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

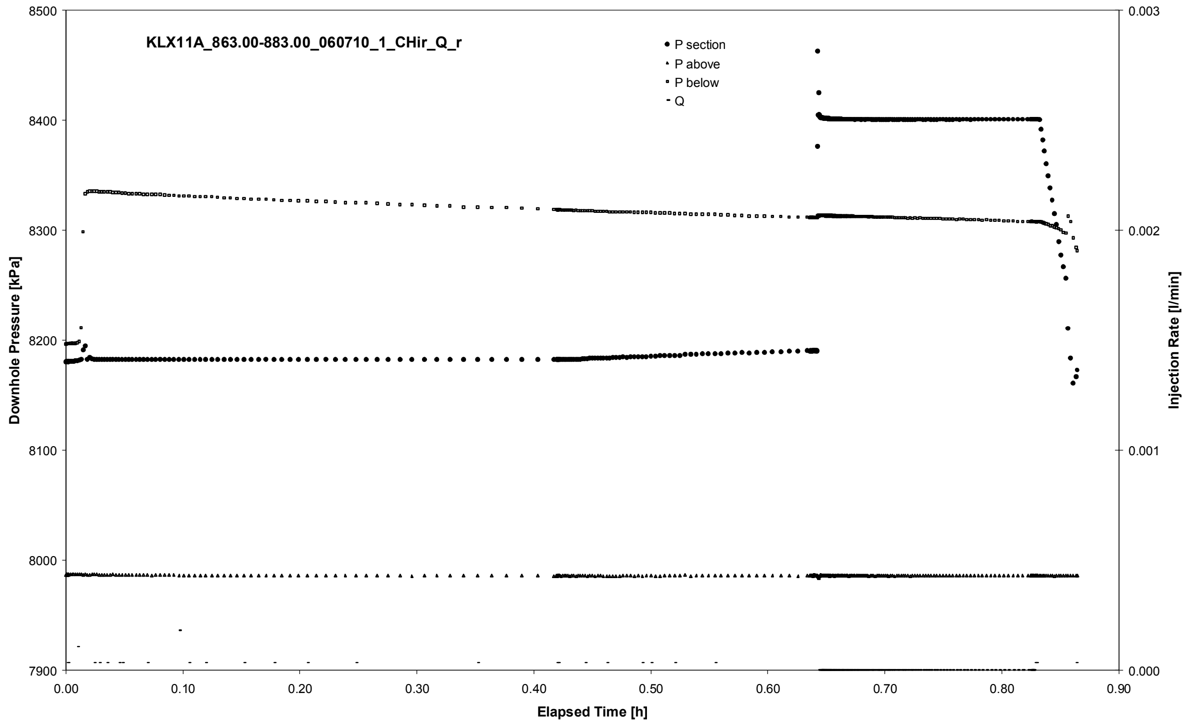
Not analysable

CHIR phase; HORNER match

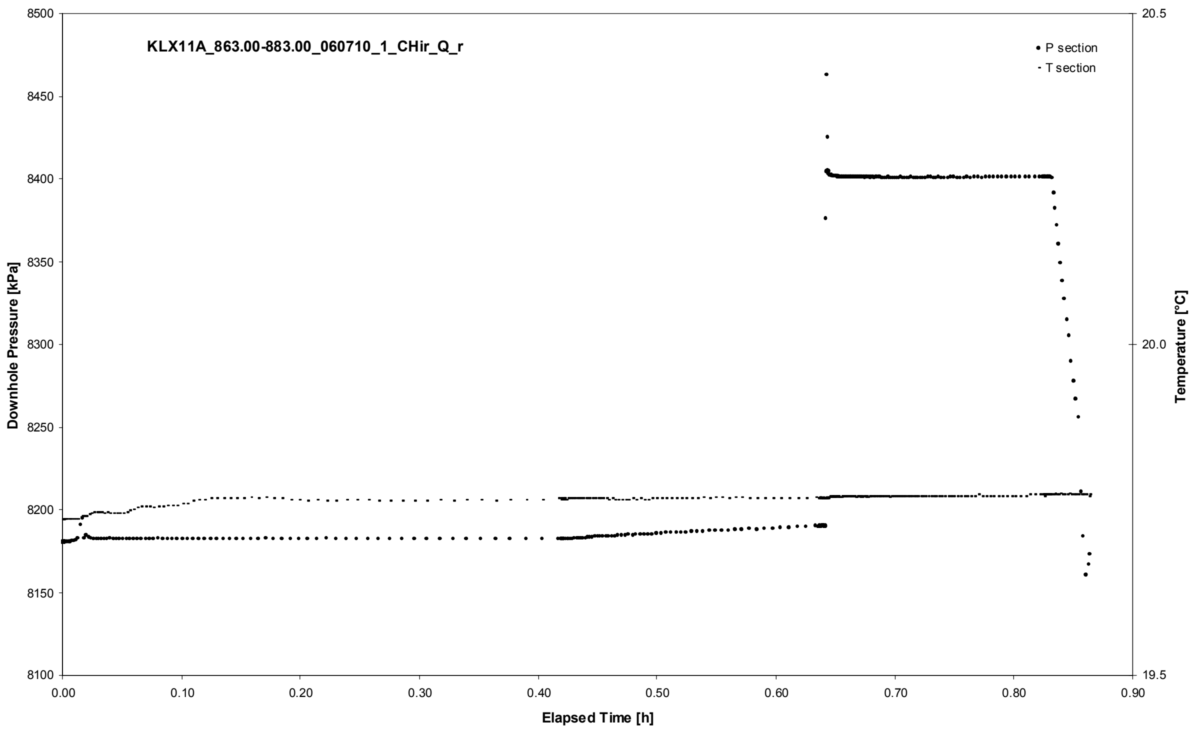
APPENDIX 2-48

Test 863.00 – 883.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

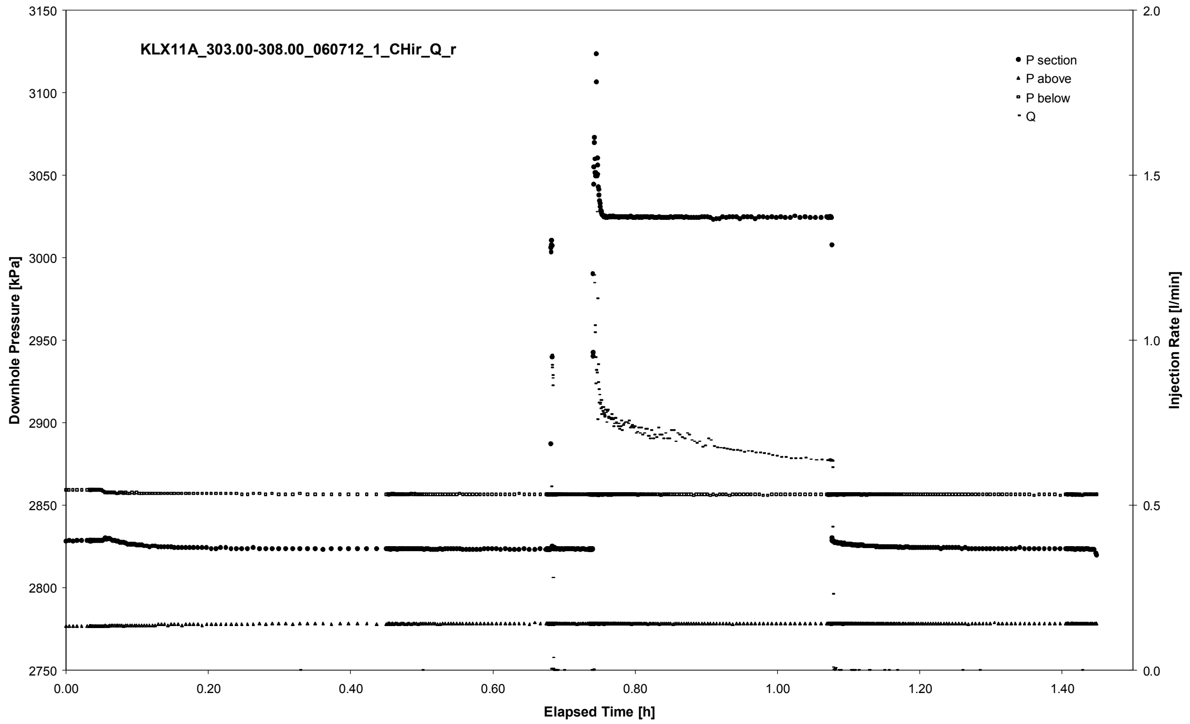
CHIR phase; log-log match

Not analysed

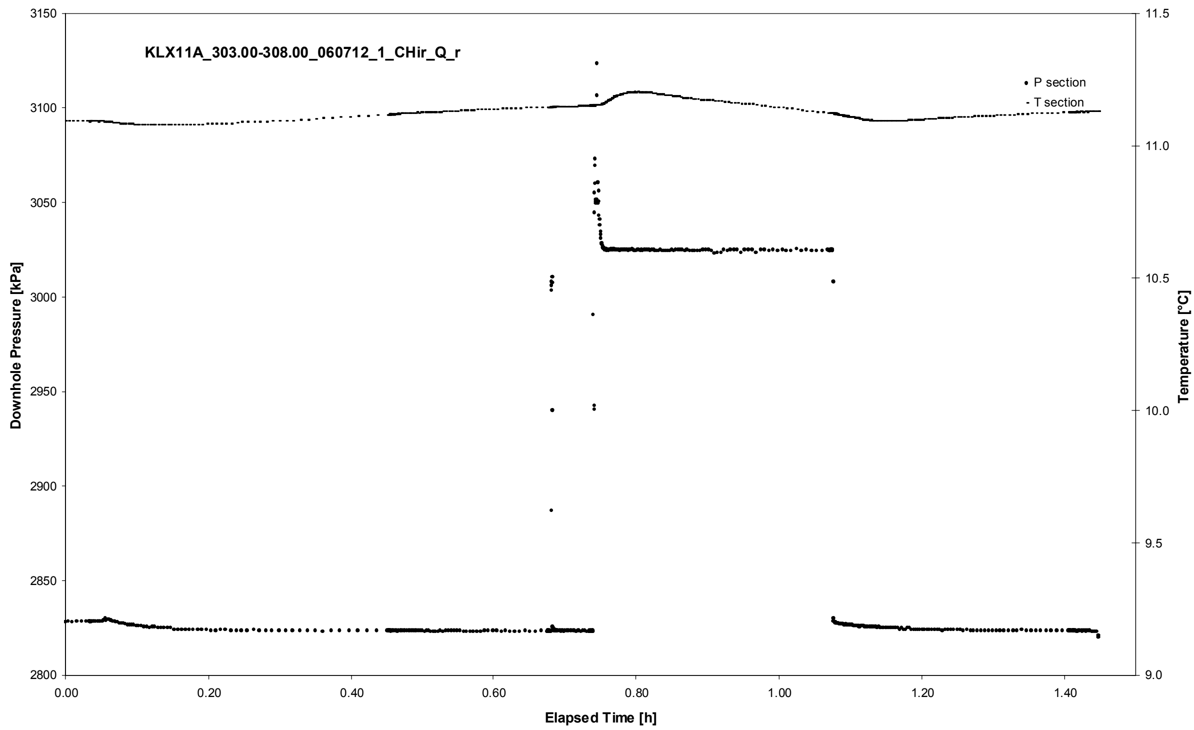
APPENDIX 2-49

Test 303.00 – 308.00 m

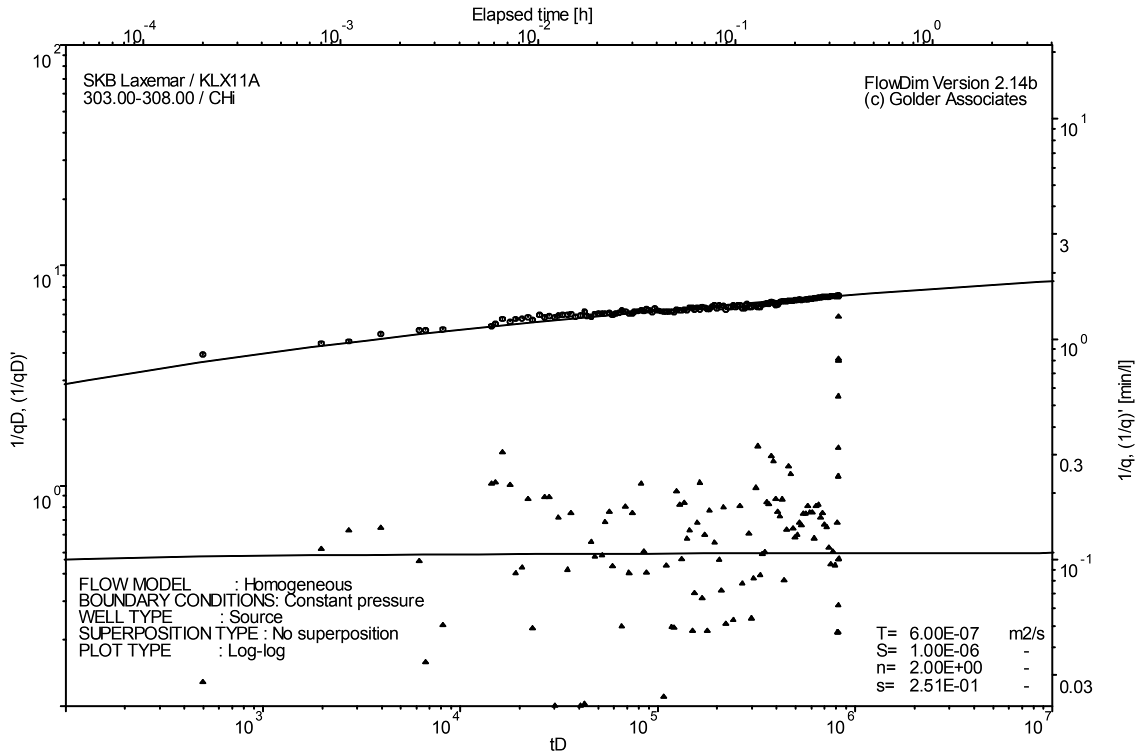
Analysis diagrams



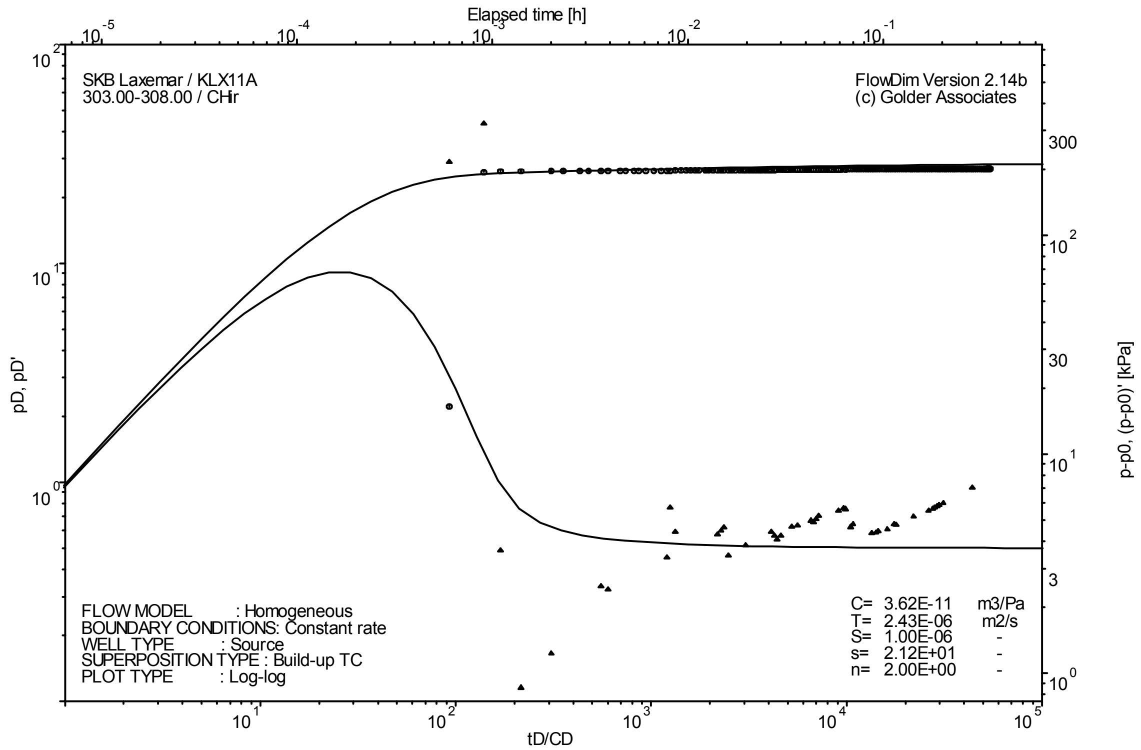
Pressure and flow rate vs. time; cartesian plot



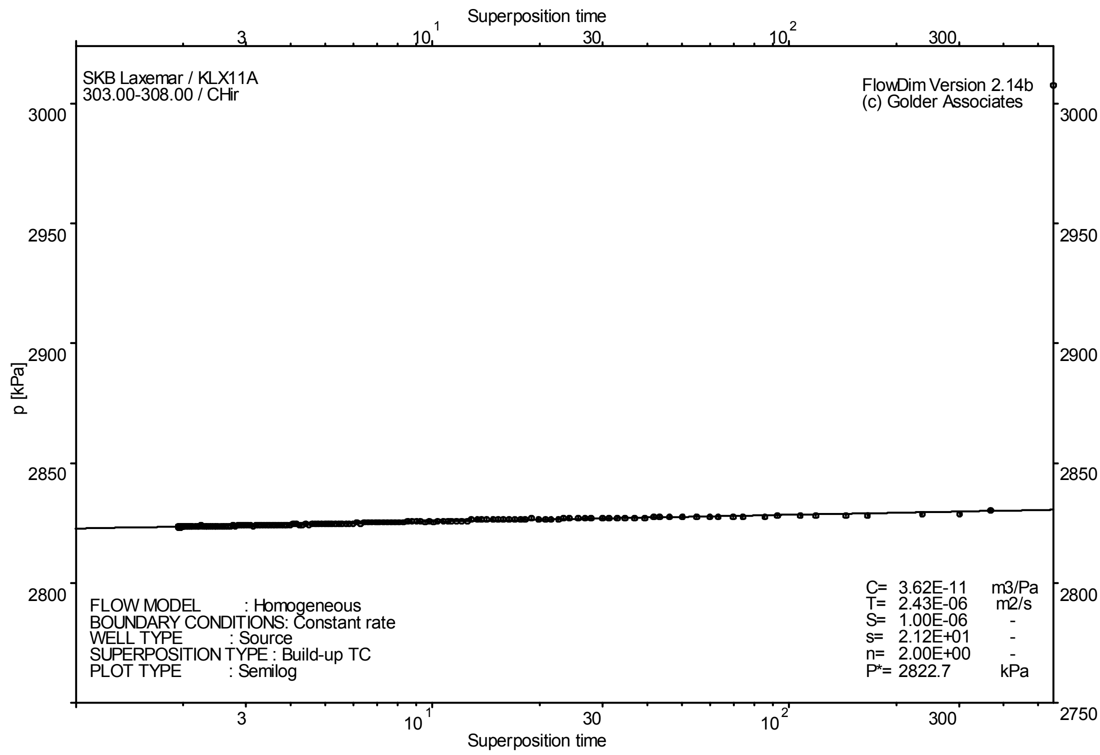
Interval pressure and temperature vs. time; cartesian plot



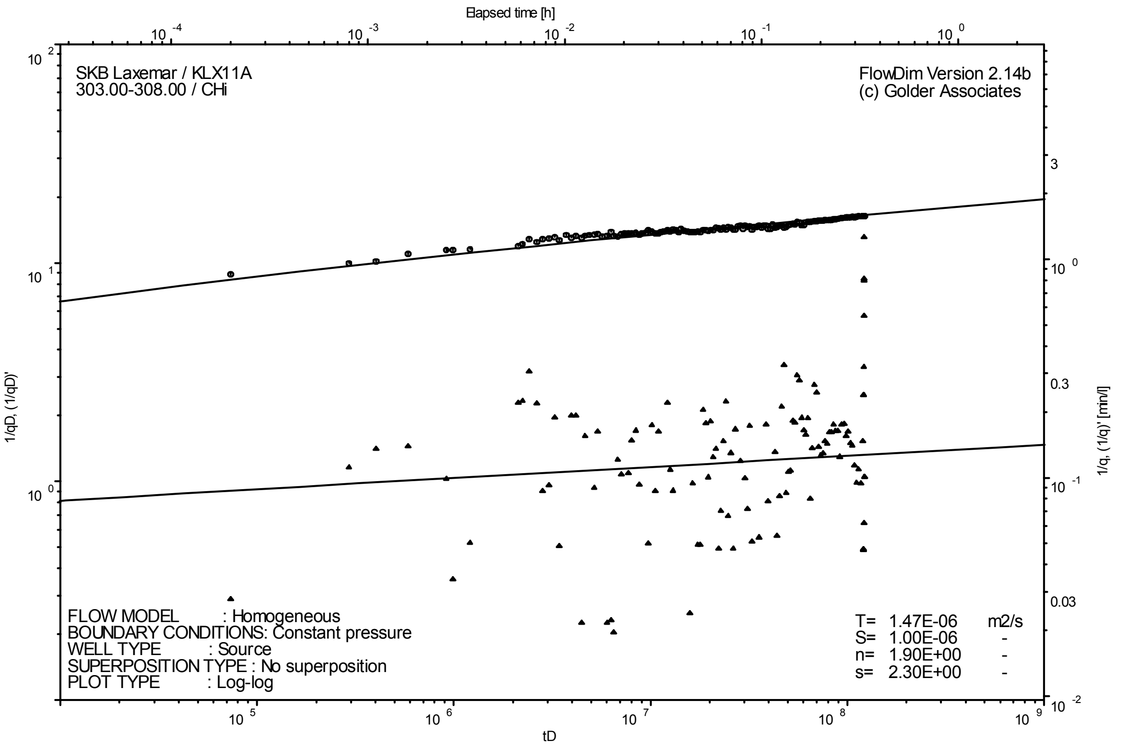
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

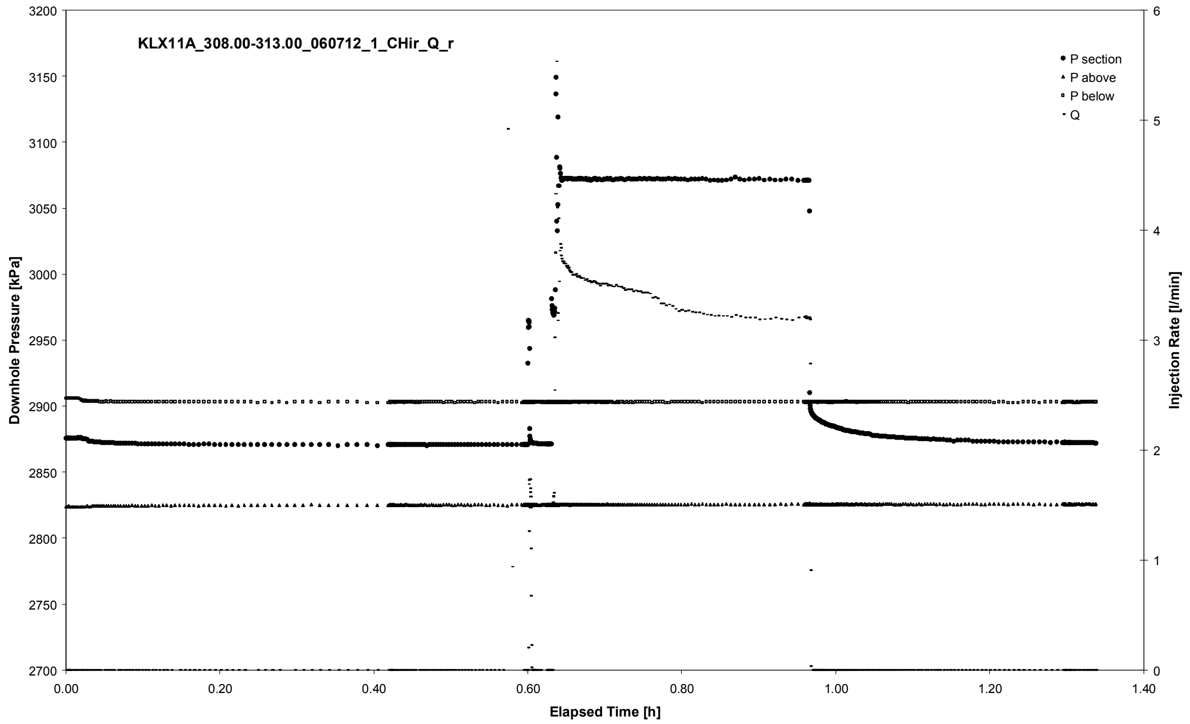


CHI phase; log-log match (n=1.9)

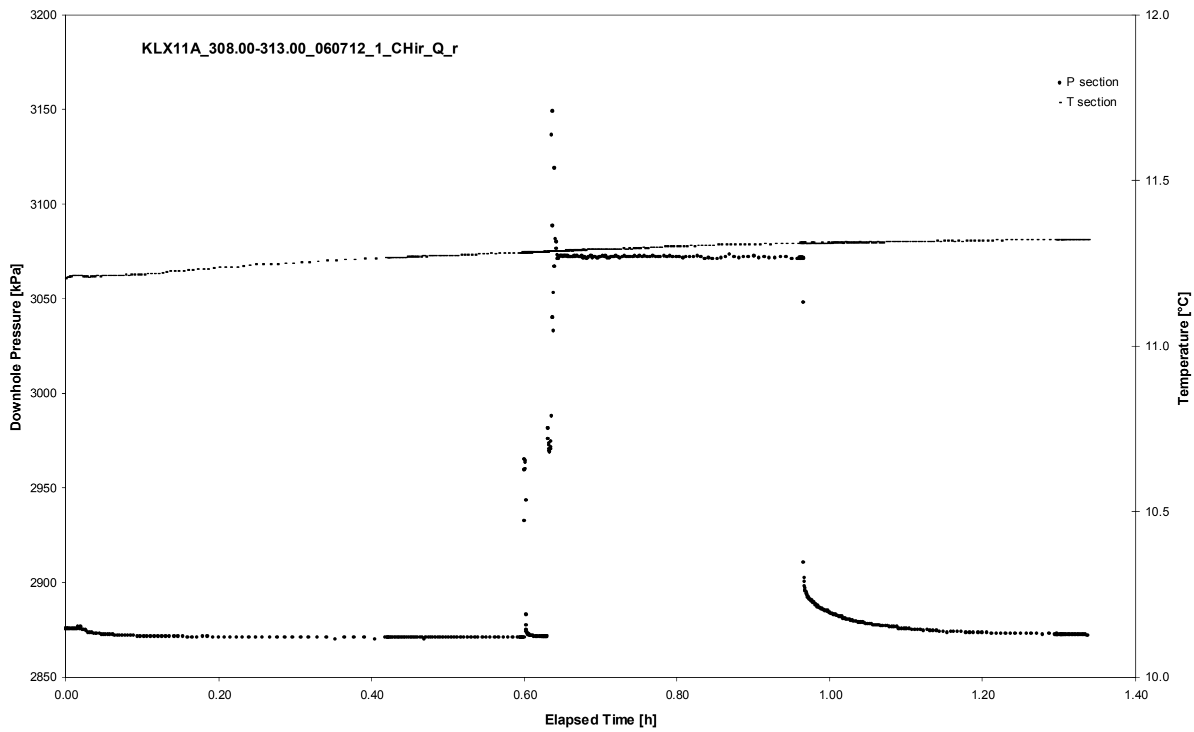
APPENDIX 2-50

Test 308.00 – 313.00 m

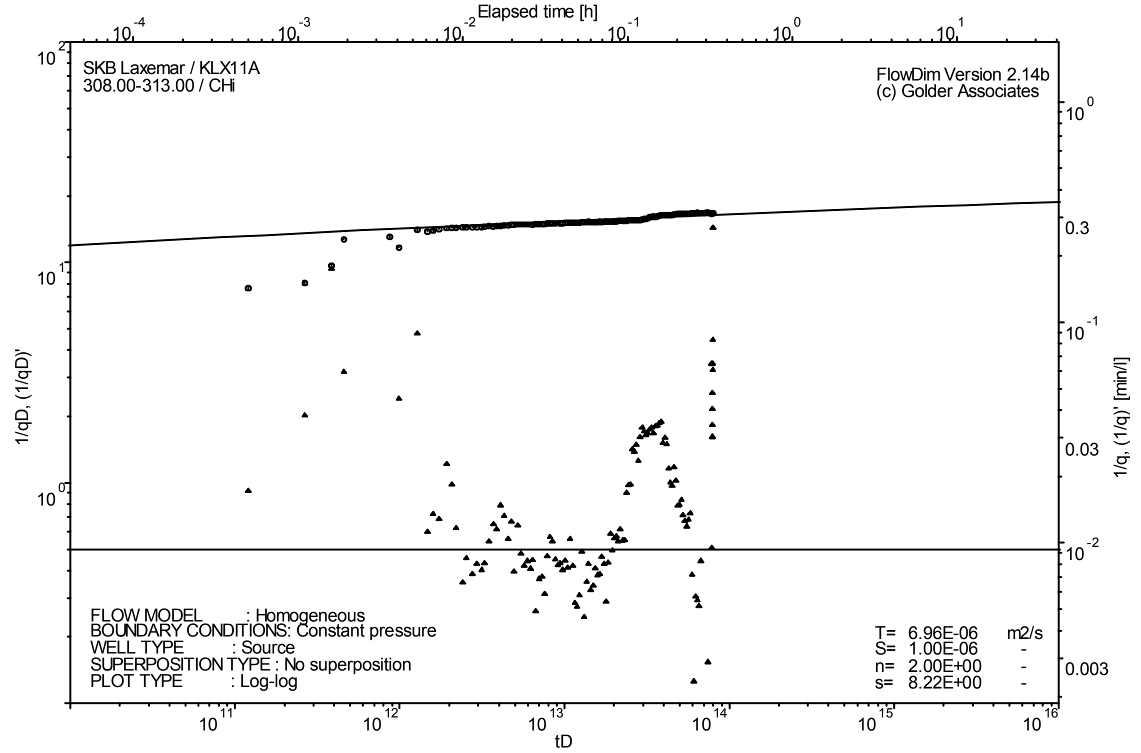
Analysis diagrams



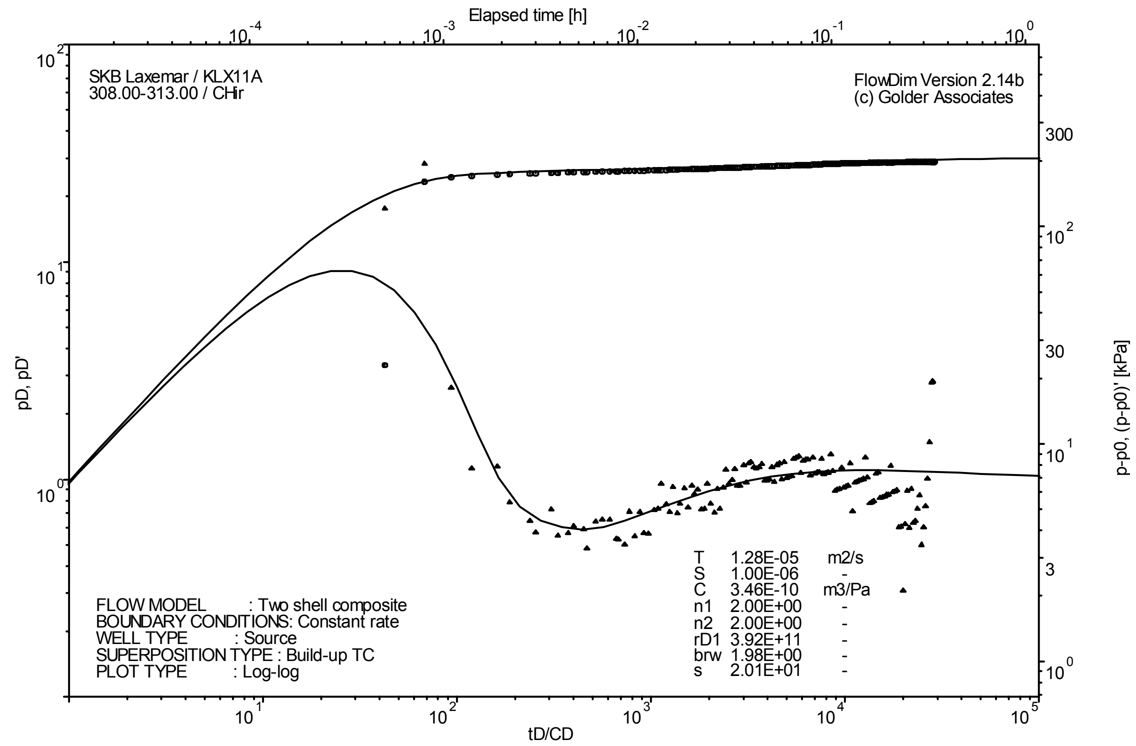
Pressure and flow rate vs. time; cartesian plot



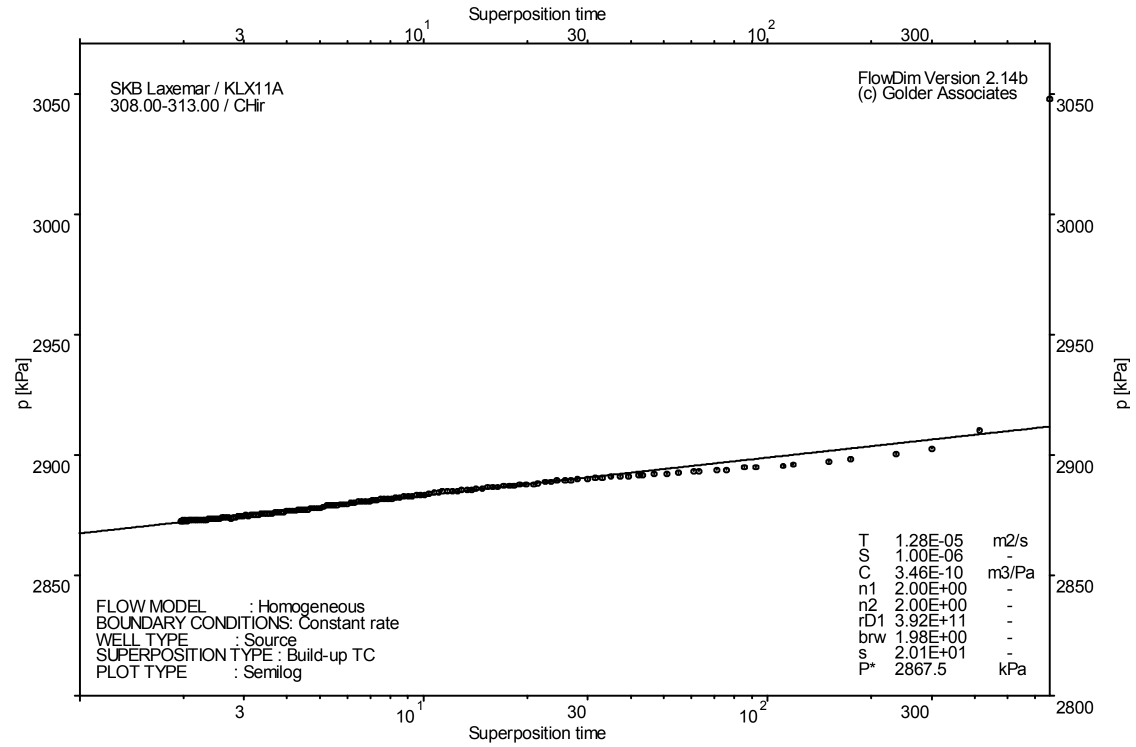
Interval pressure and temperature vs. time; cartesian plot



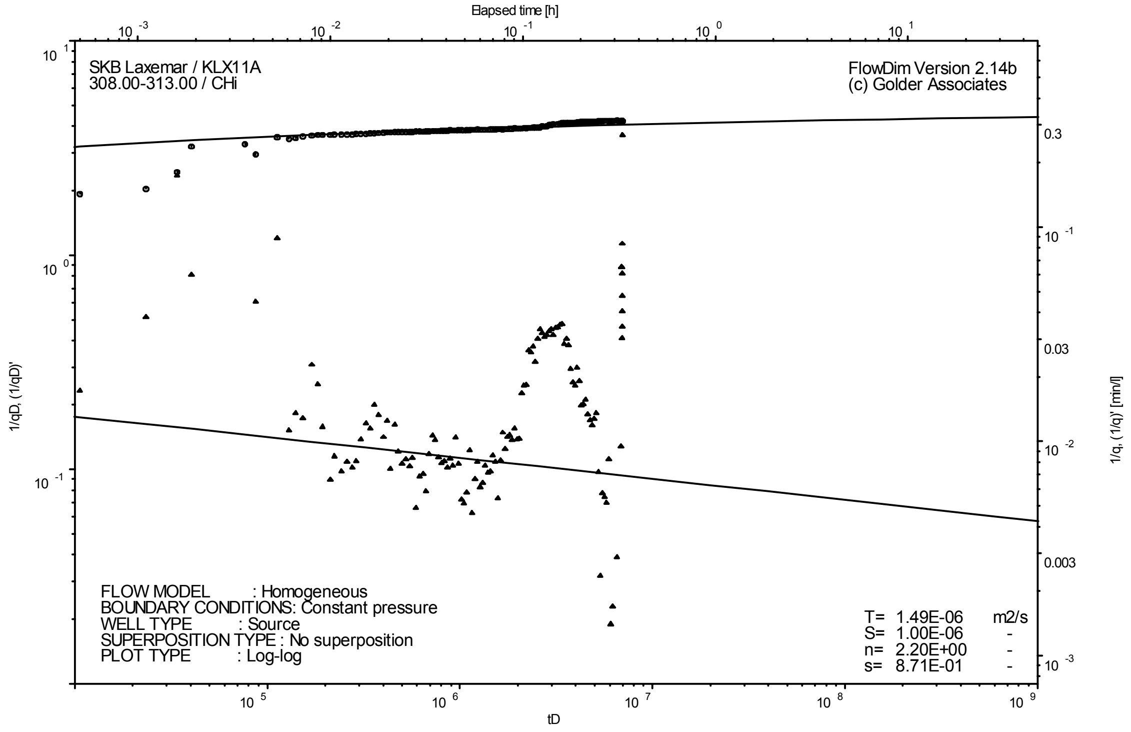
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

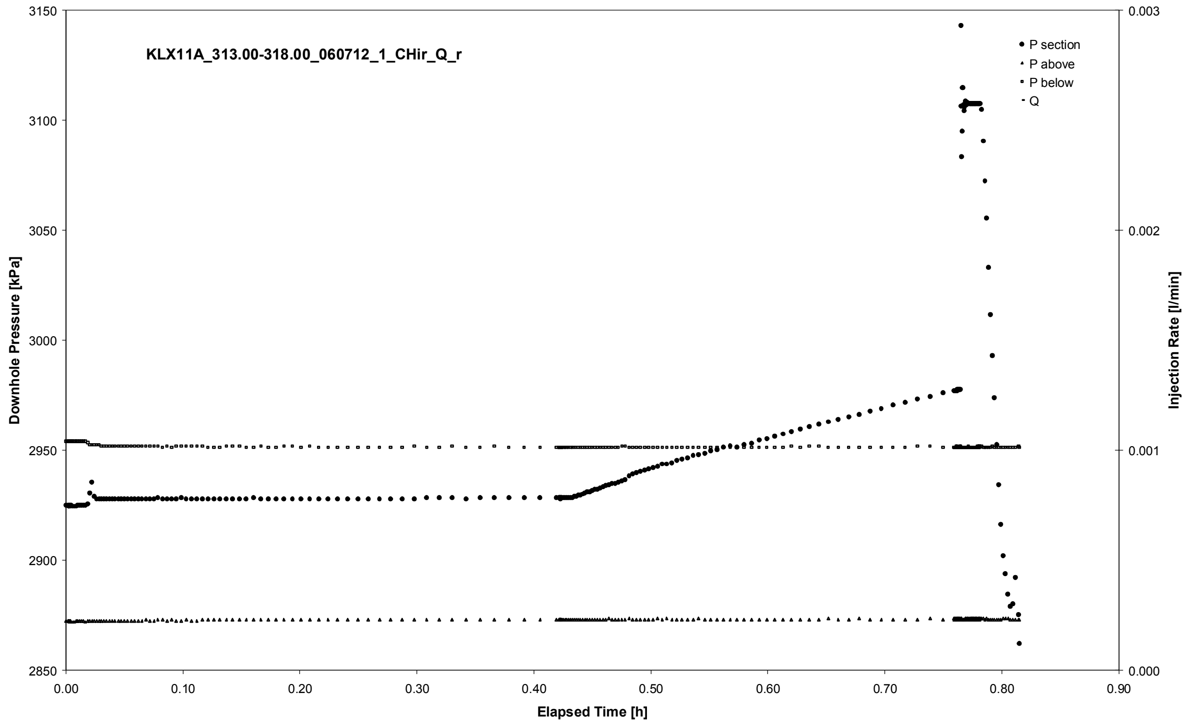


CHI phase; log-log match (n=2.2)

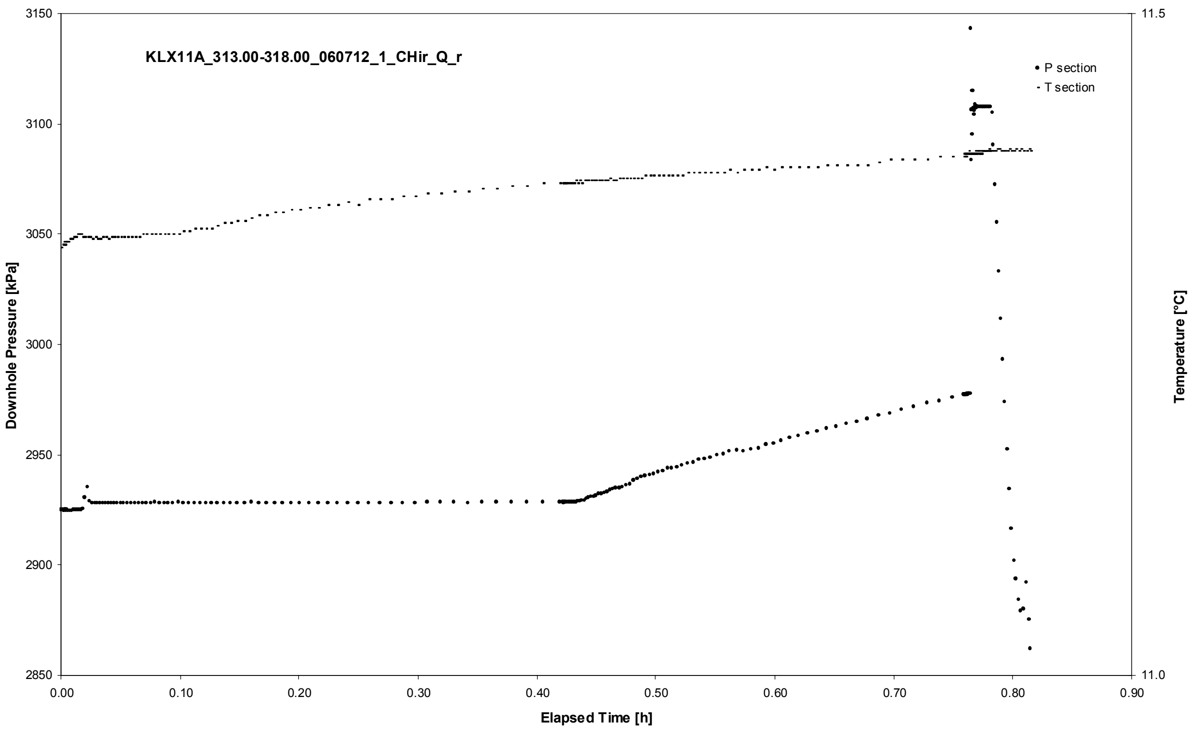
APPENDIX 2-51

Test 313.00 – 318.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

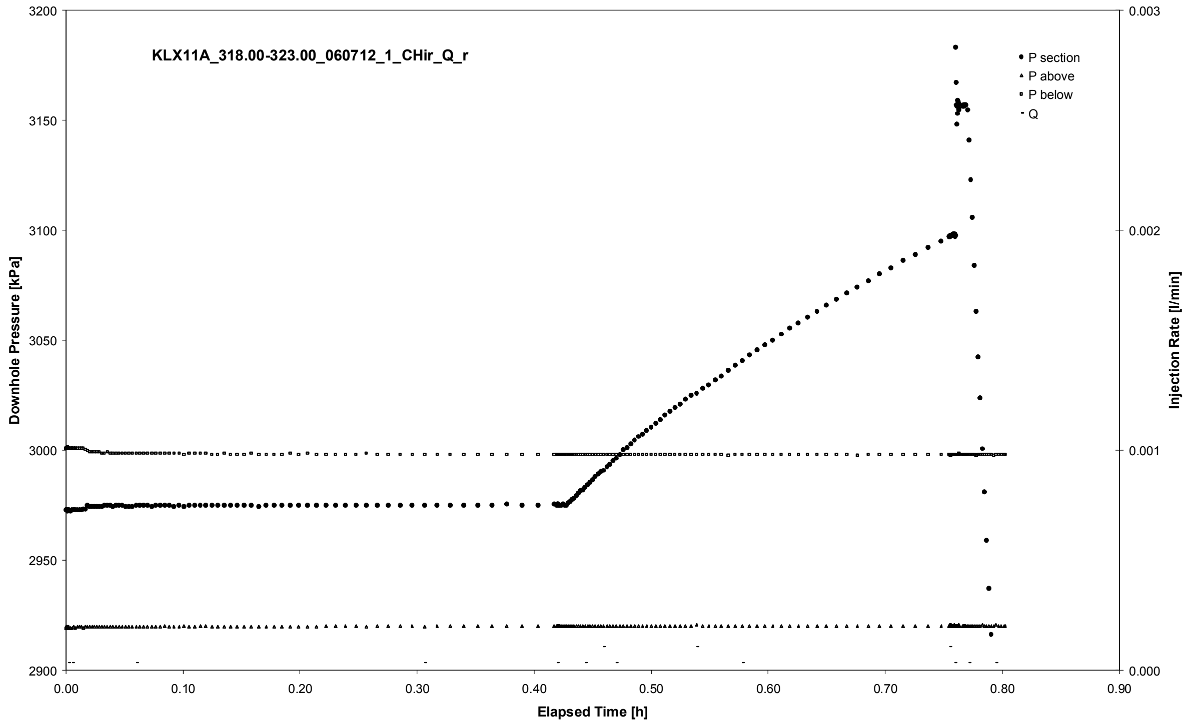
CHIR phase; log-log match

Not analysed

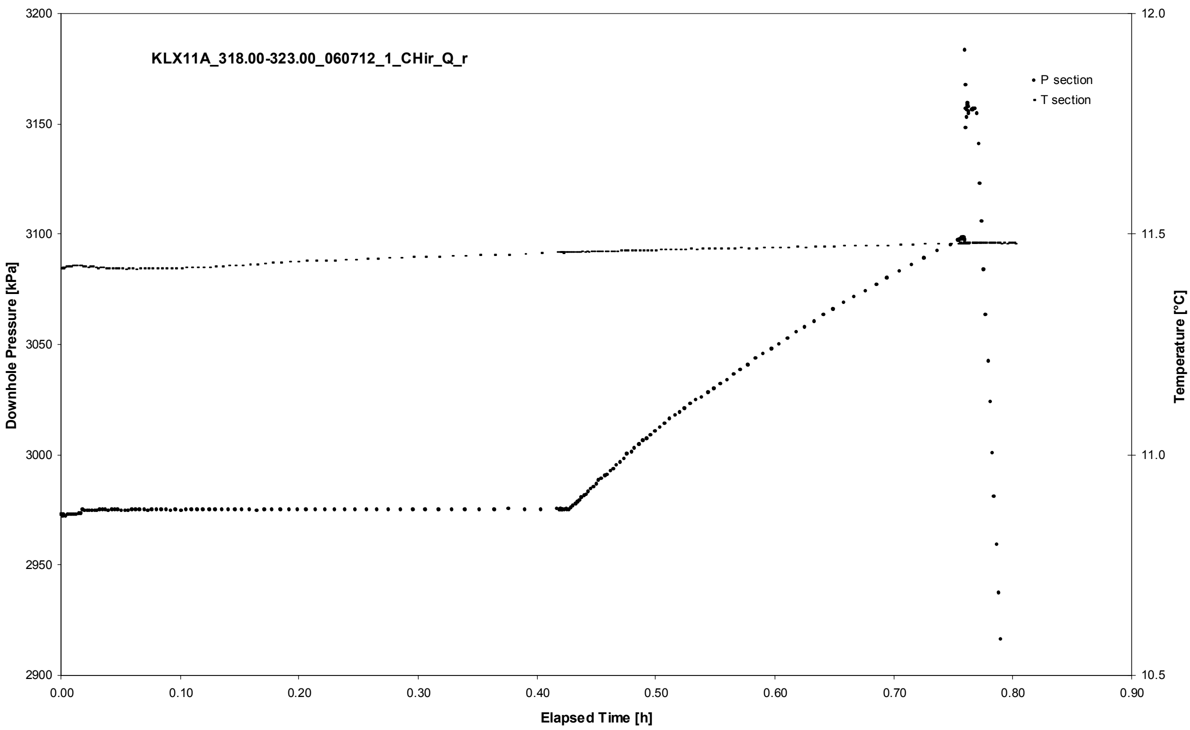
APPENDIX 2-52

Test 318.00 – 323.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

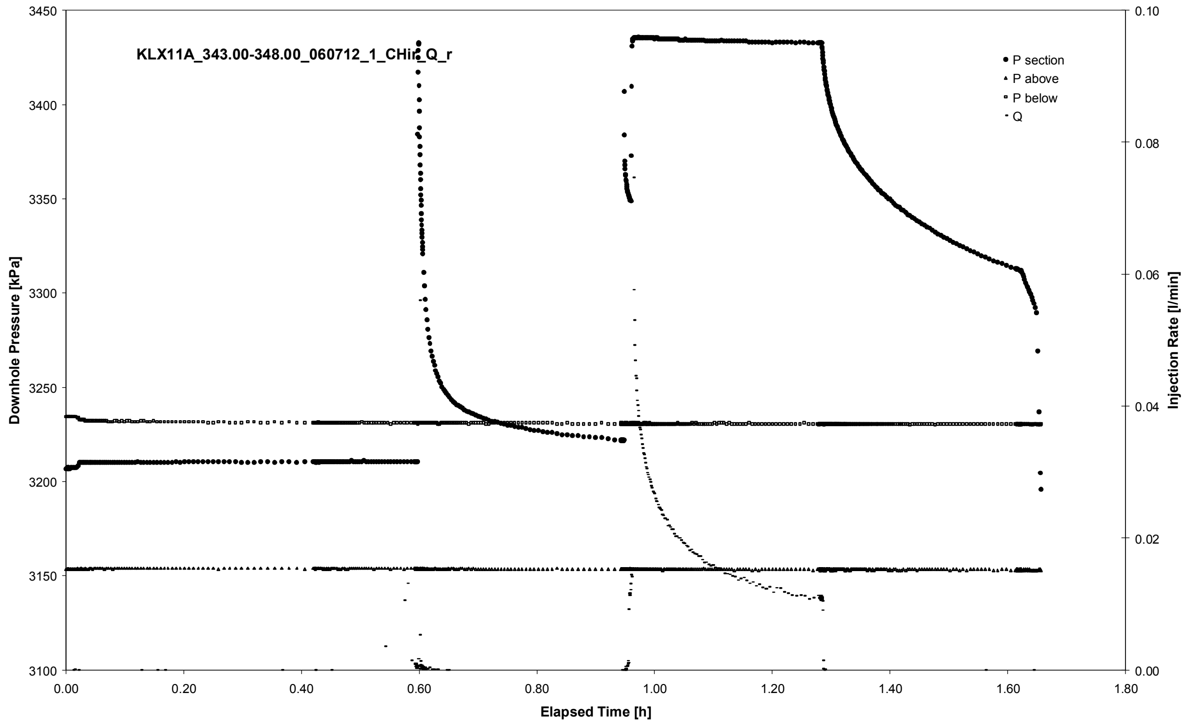
CHIR phase; log-log match

Not analysed

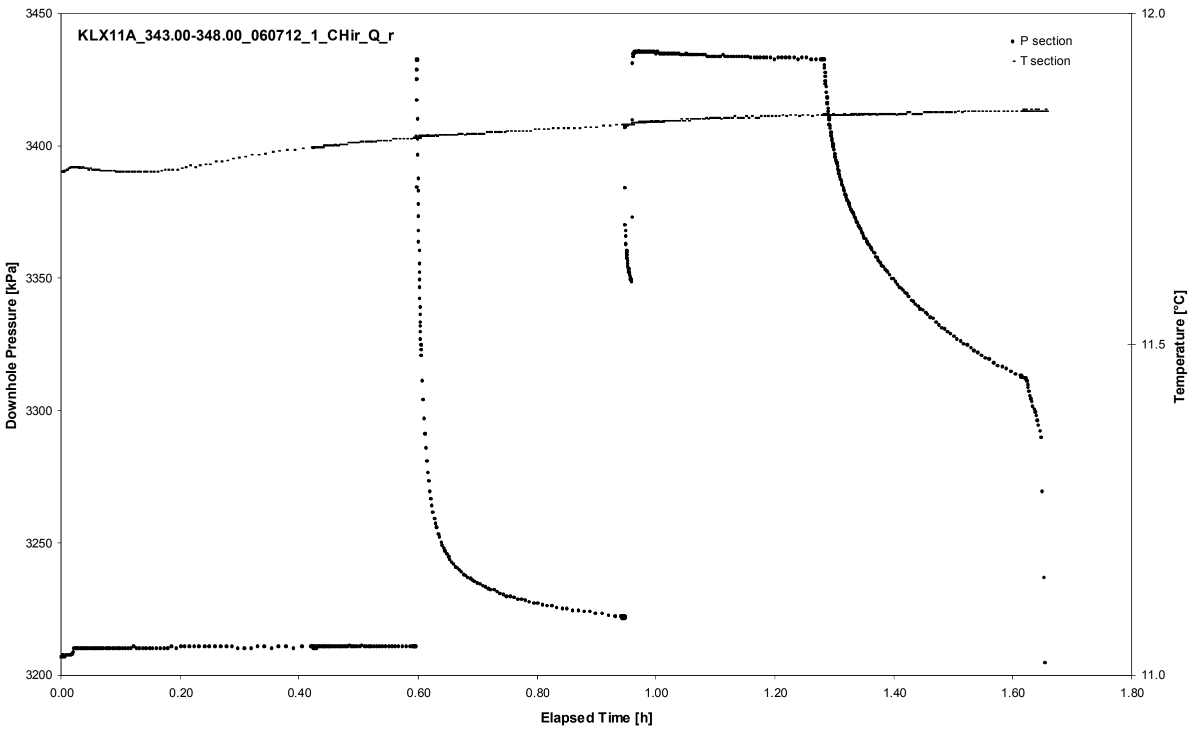
APPENDIX 2-53

Test 343.00 – 348.00 m

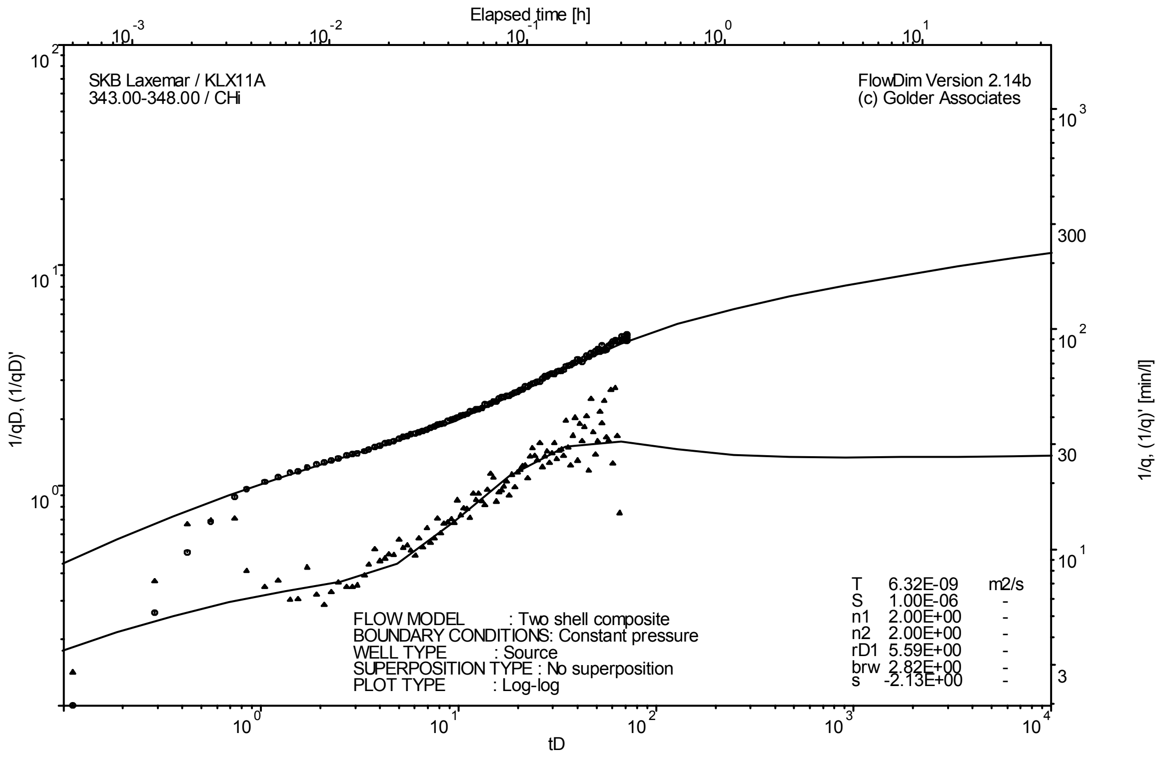
Analysis diagrams



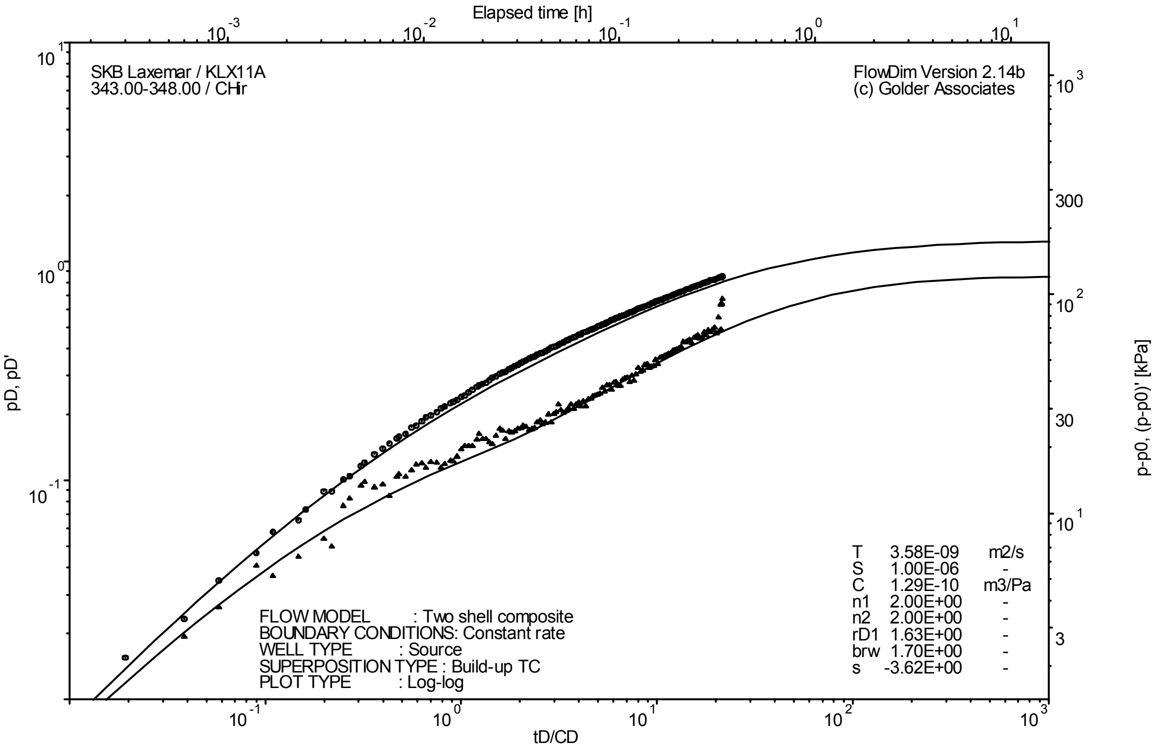
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



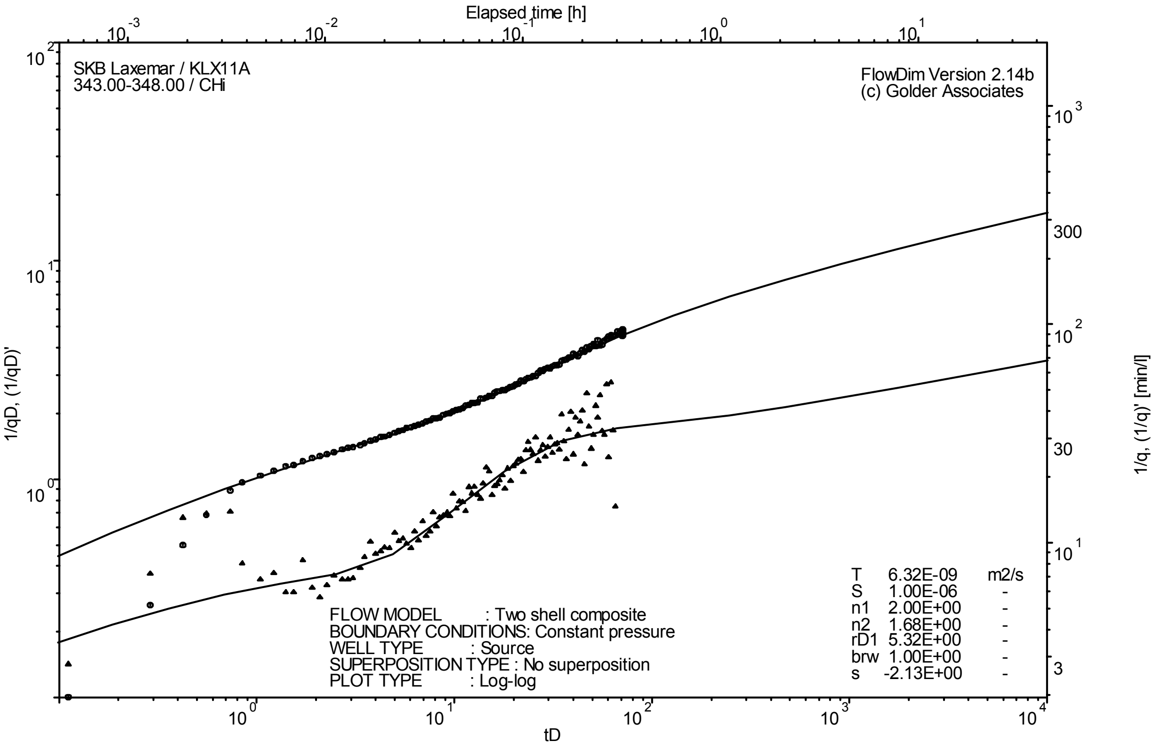
CHI phase; log-log match



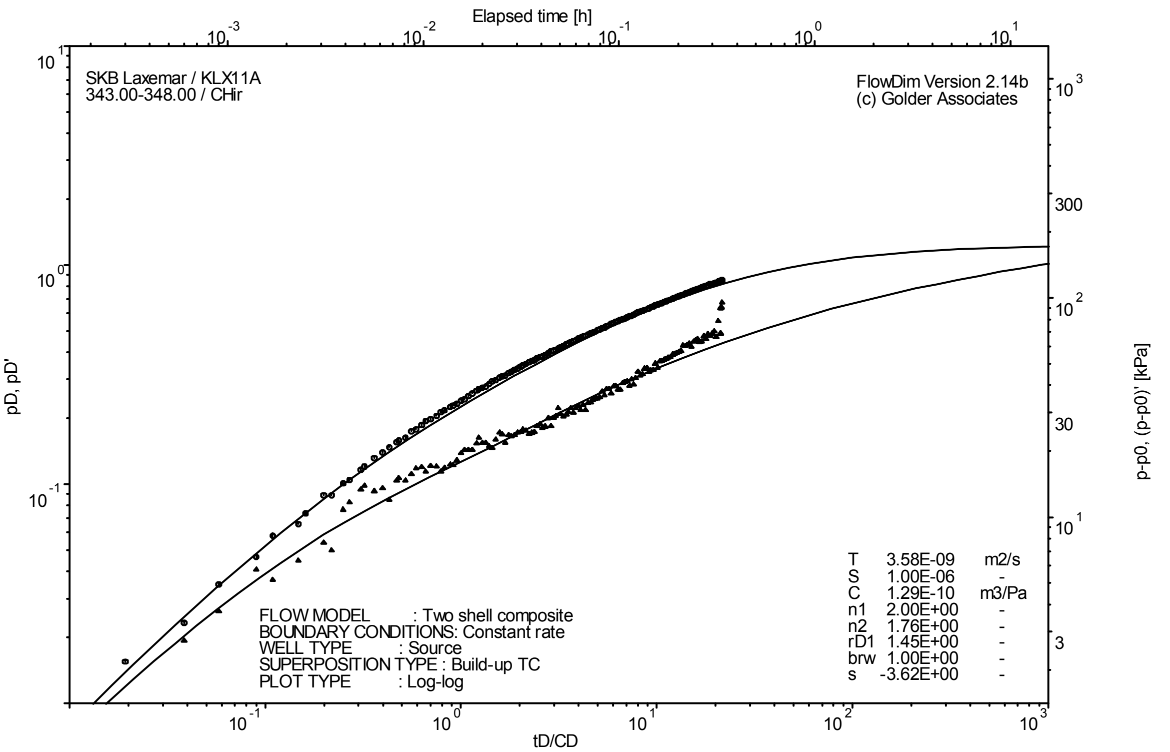
CHIR phase; log-log match

Not analysable

CHIR phase; HORNER match



CHI phase; log-log match (n1=2, n2=1.68)

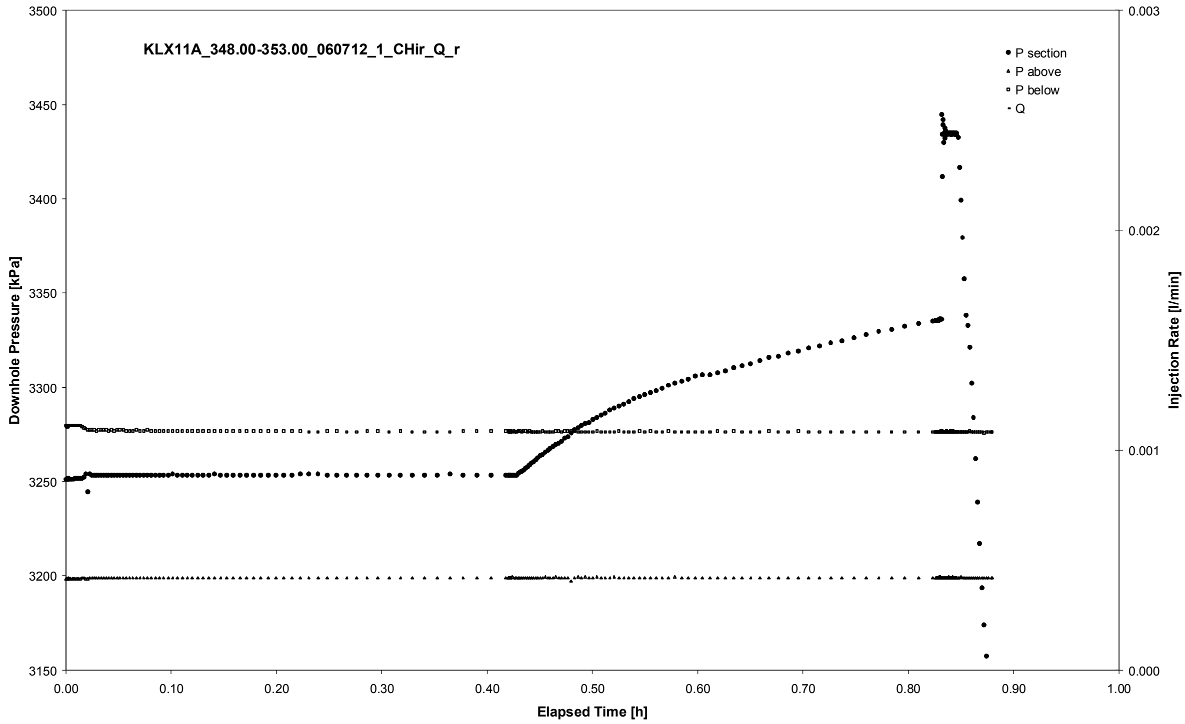


CHIR phase; log-log match (n1=2, n2=1.76)

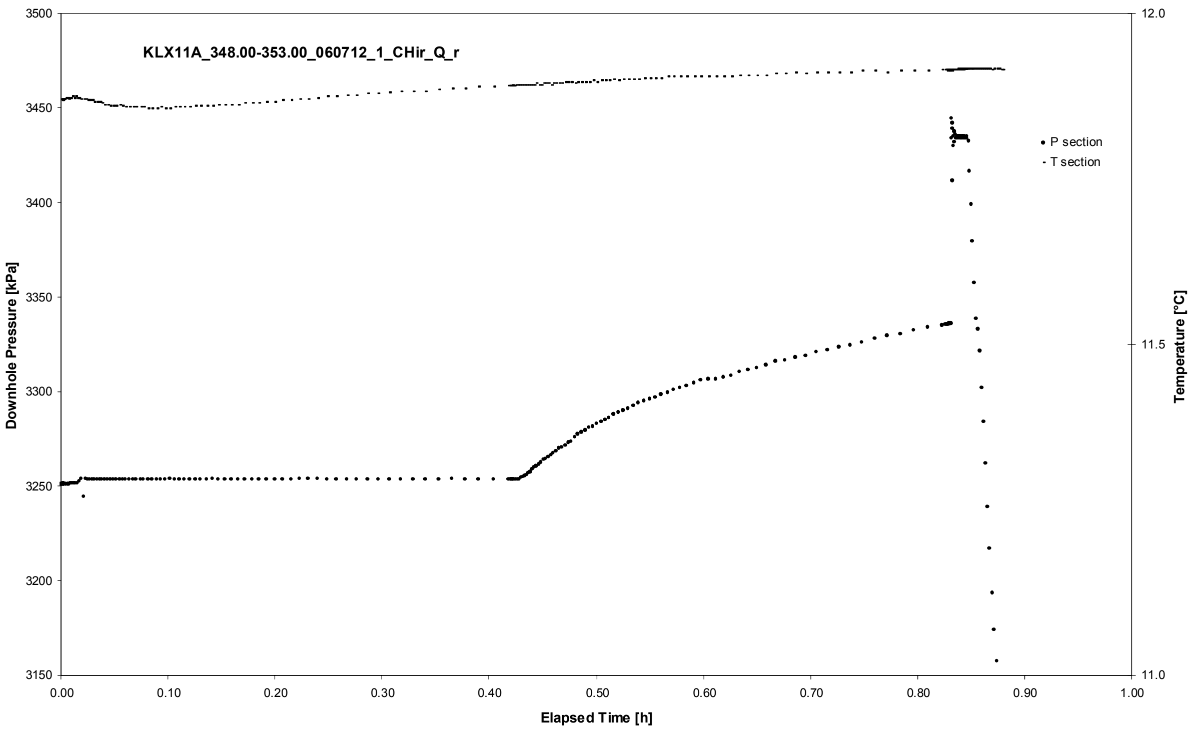
APPENDIX 2-54

Test 348.00 – 353.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

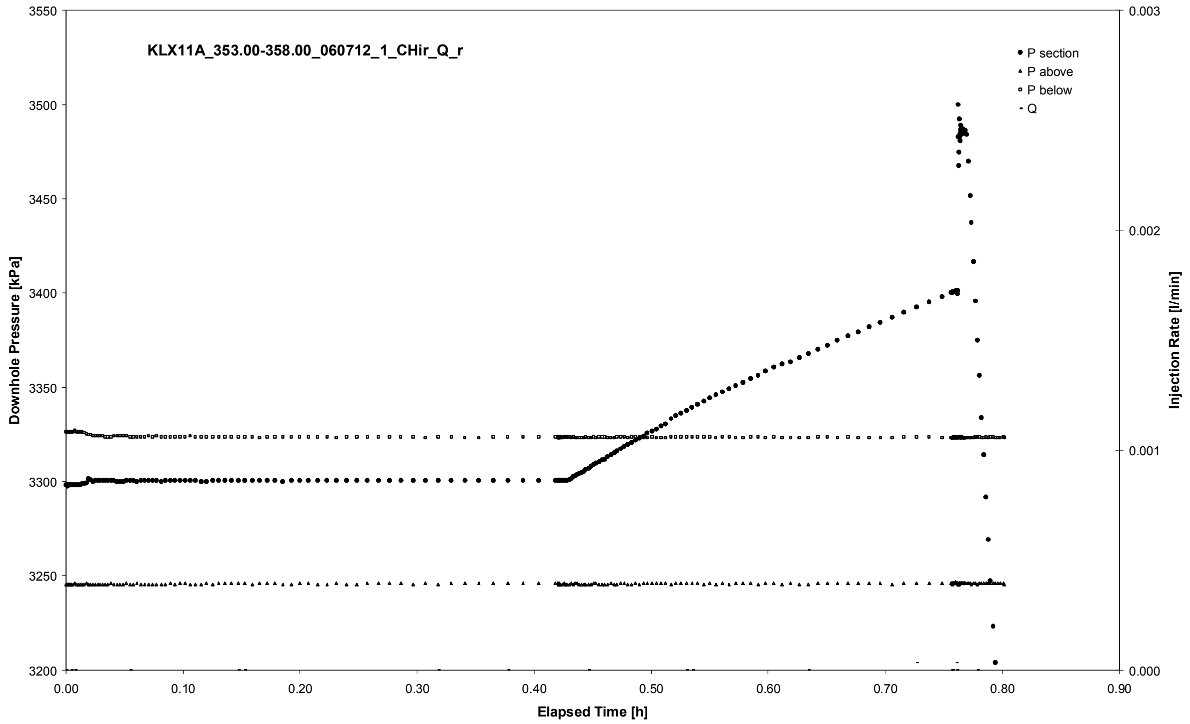
CHIR phase; log-log match

Not analysed

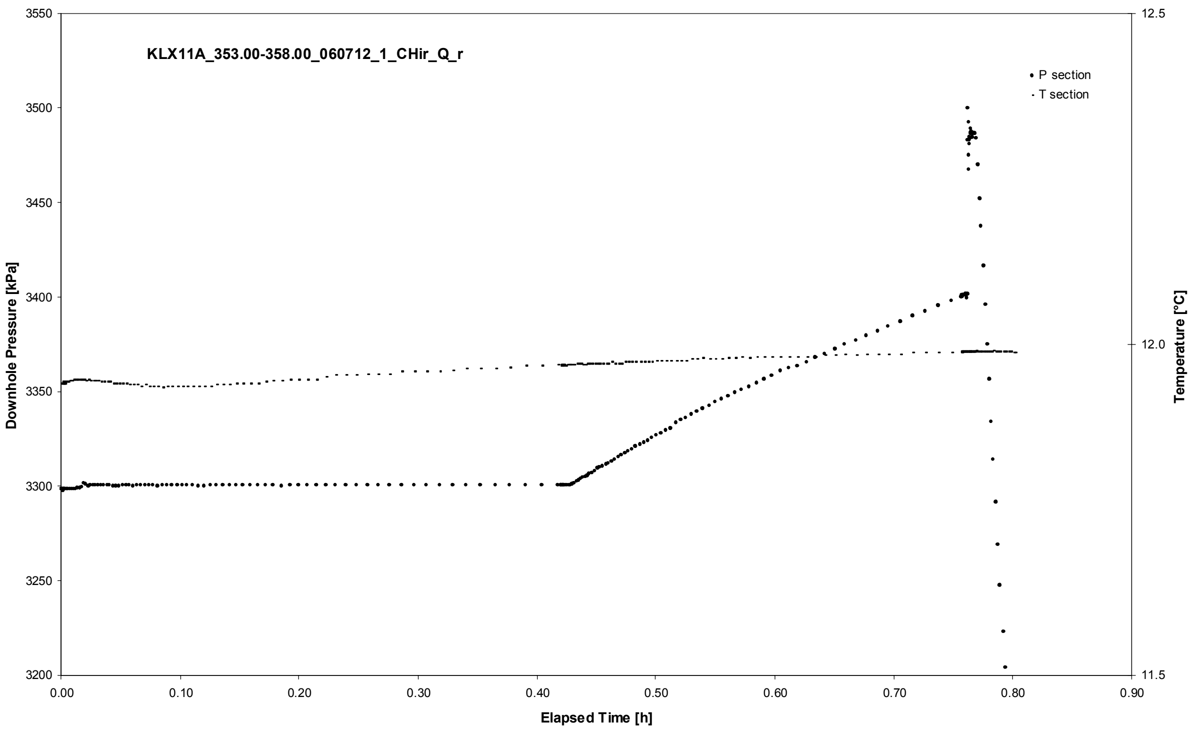
APPENDIX 2-55

Test 353.00 – 358.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

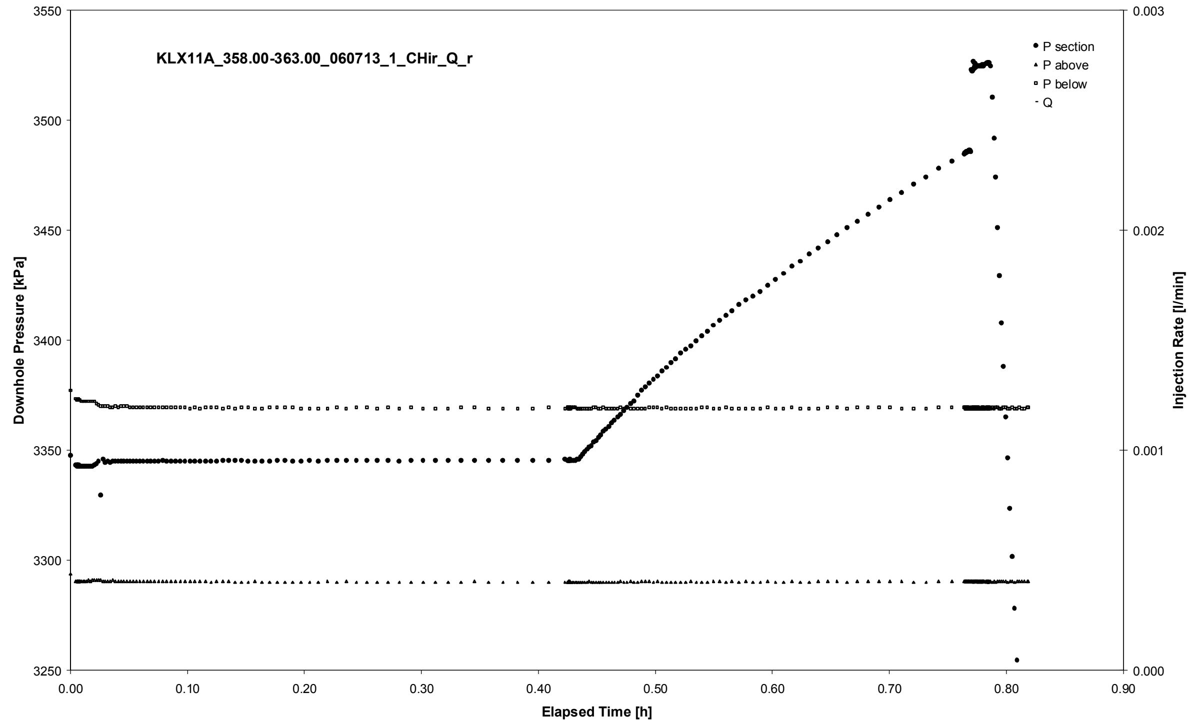
CHIR phase; log-log match

Not analysed

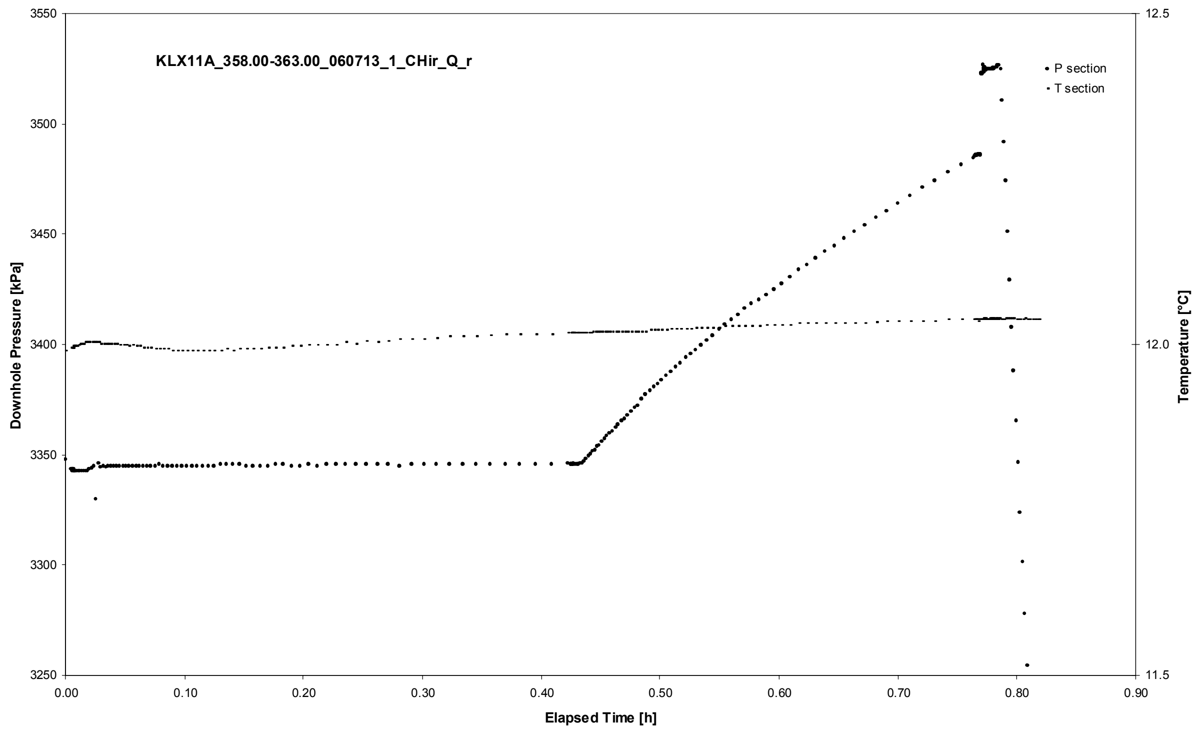
APPENDIX 2-56

Test 358.00 – 363.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

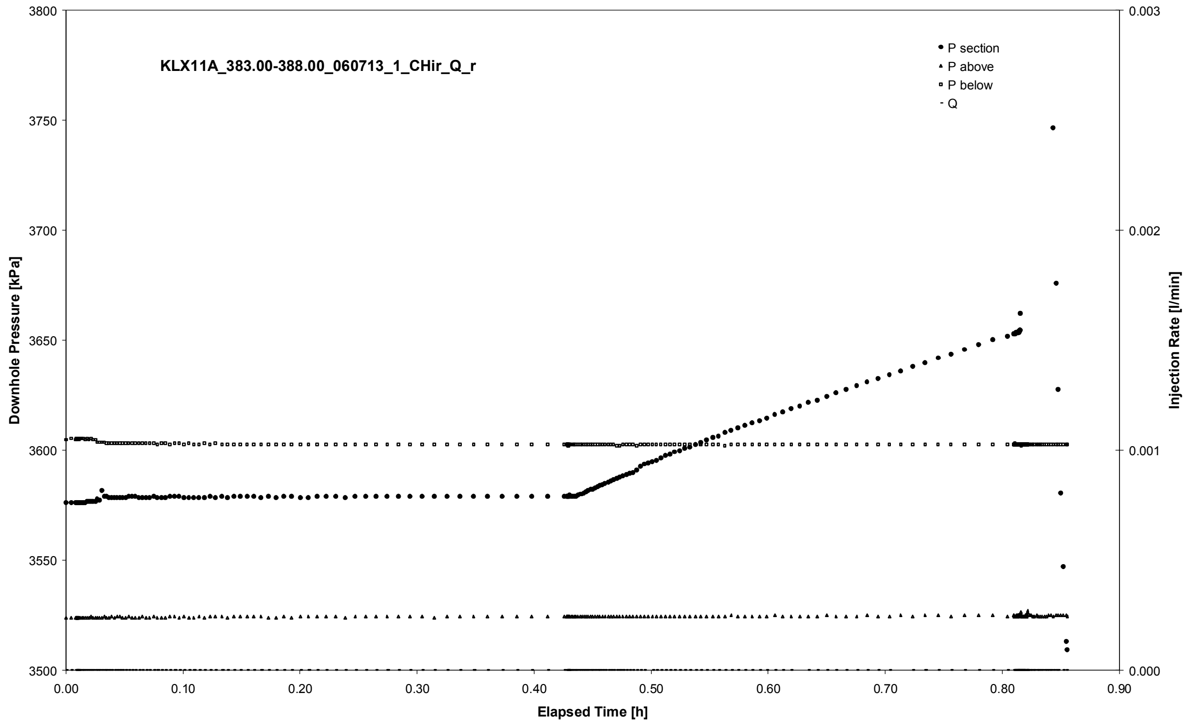
CHIR phase; log-log match

Not analysed

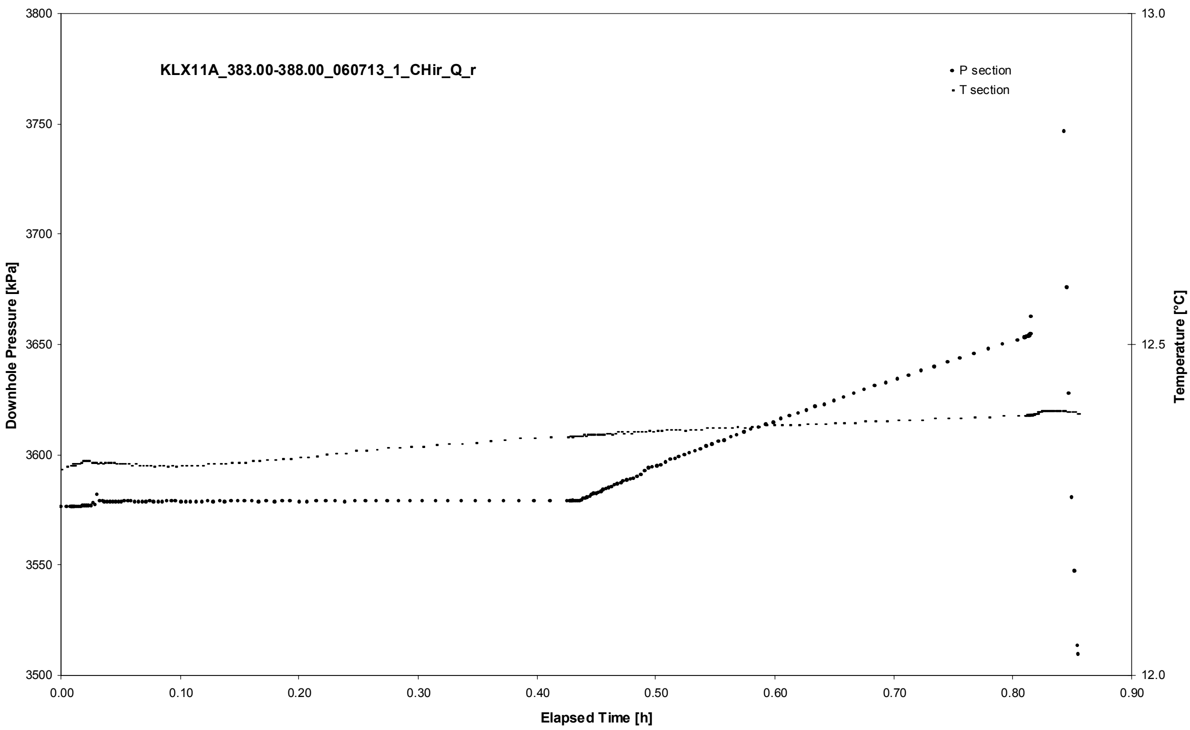
APPENDIX 2-57

Test 383.00 – 388.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

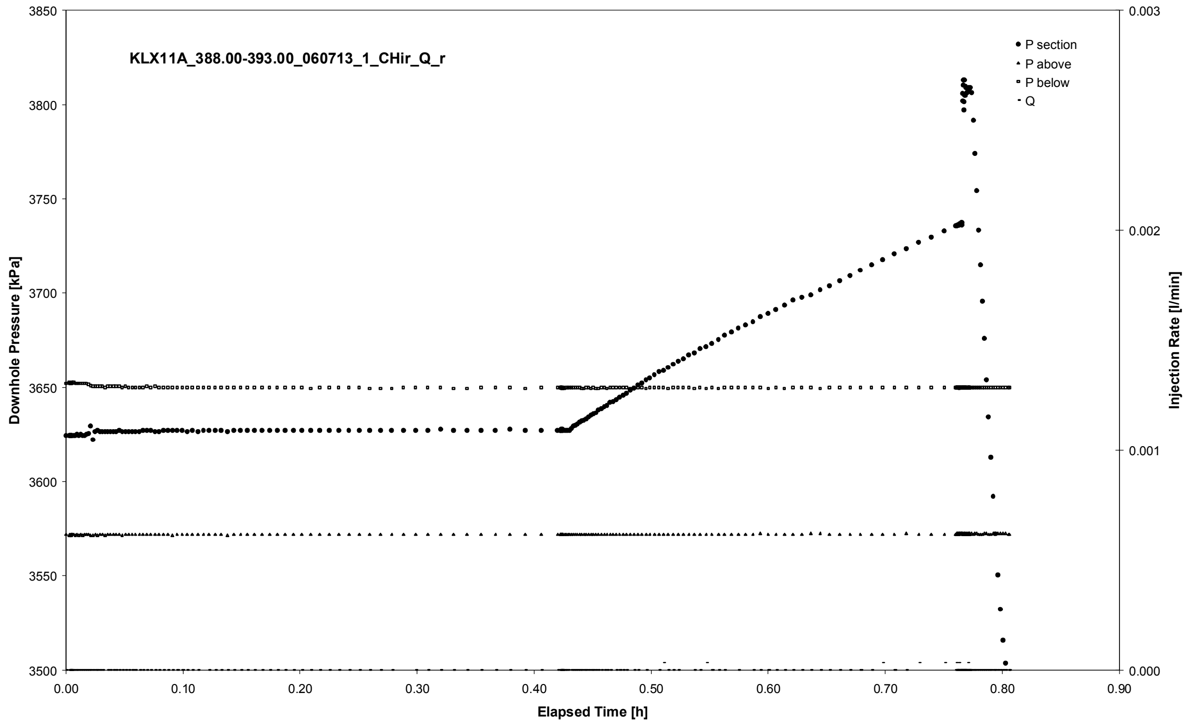
CHIR phase; log-log match

Not analysed

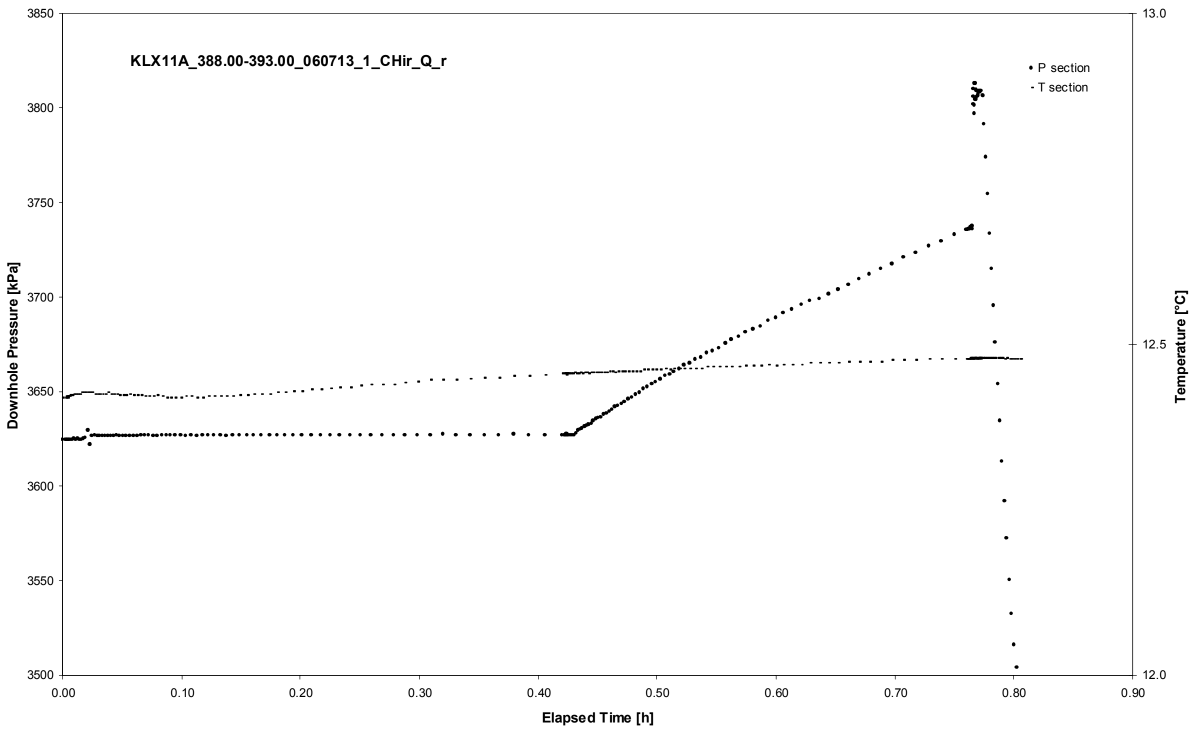
APPENDIX 2-58

Test 388.00 – 393.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

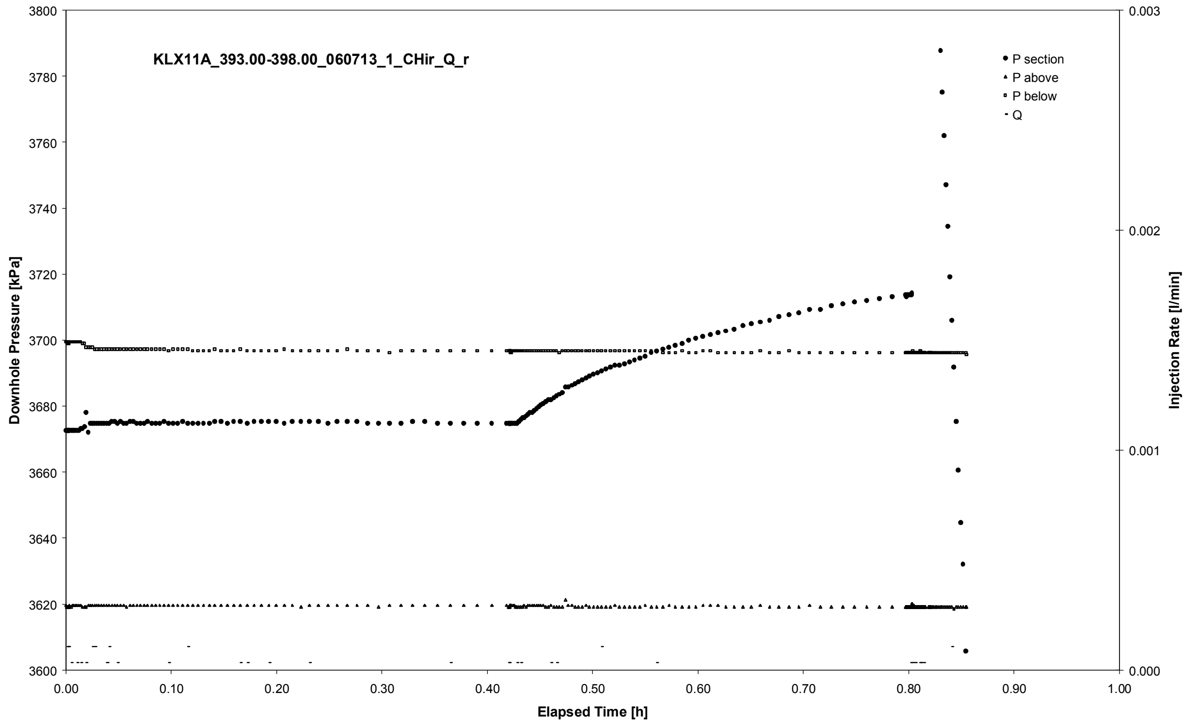
CHIR phase; log-log match

Not analysed

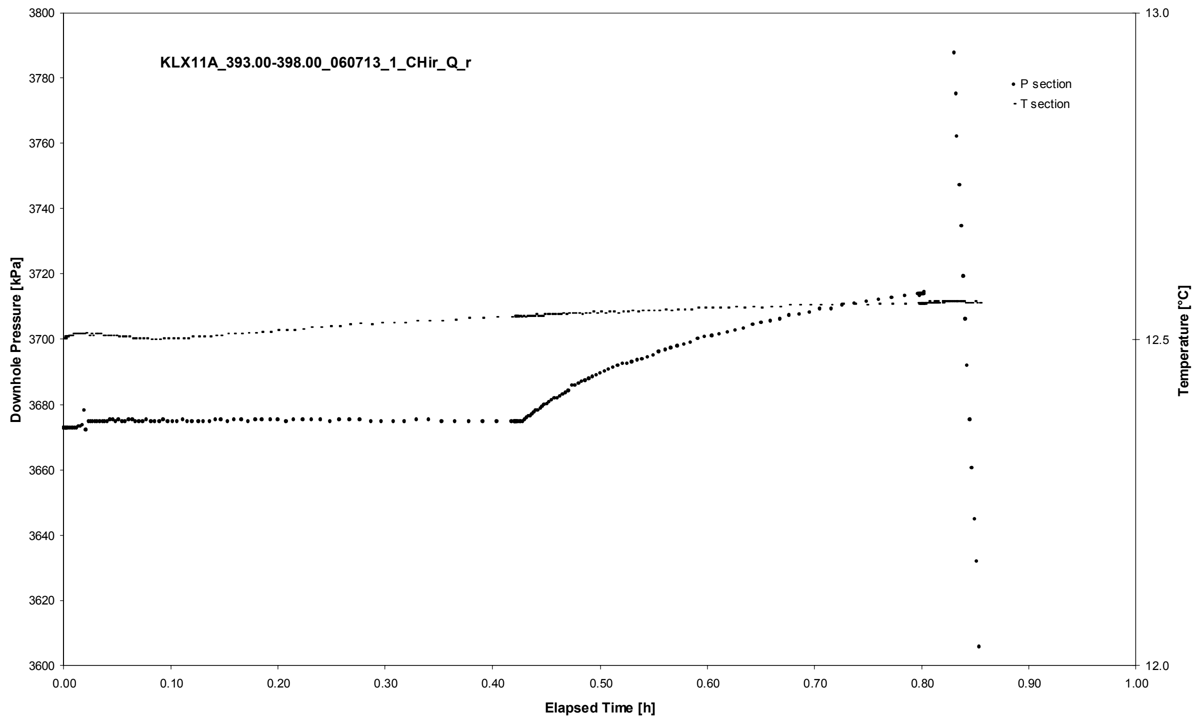
APPENDIX 2-59

Test 393.00 – 398.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

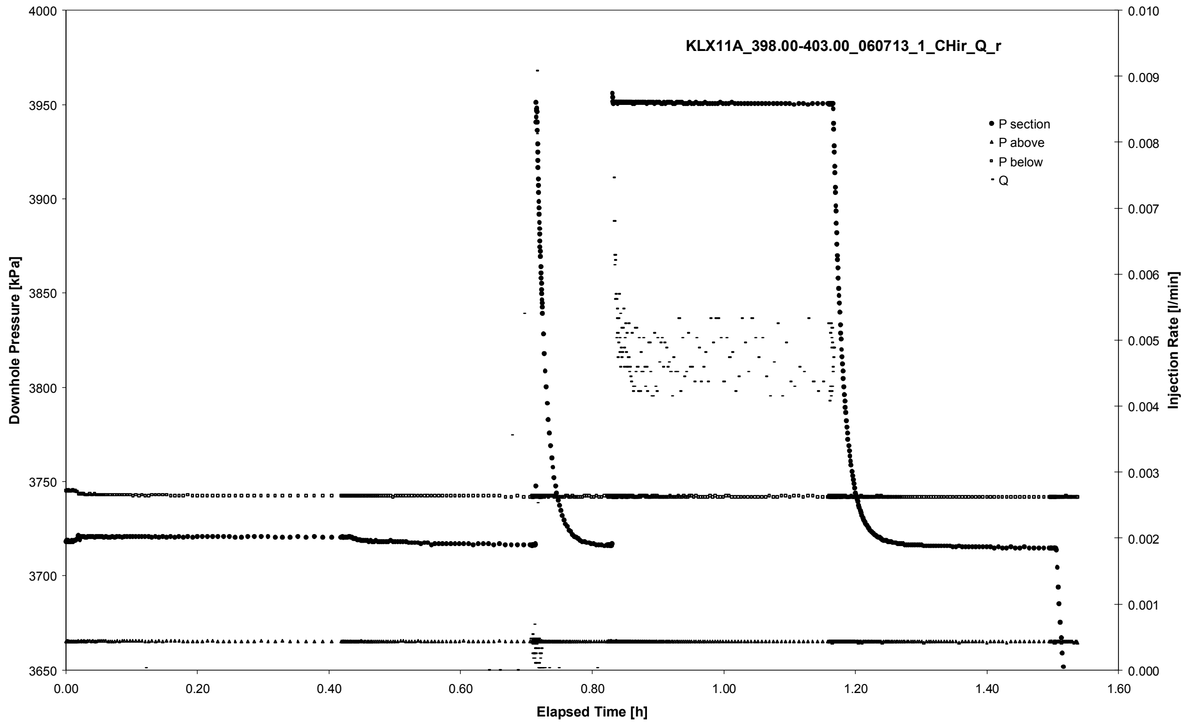
CHIR phase; log-log match

Not analysed

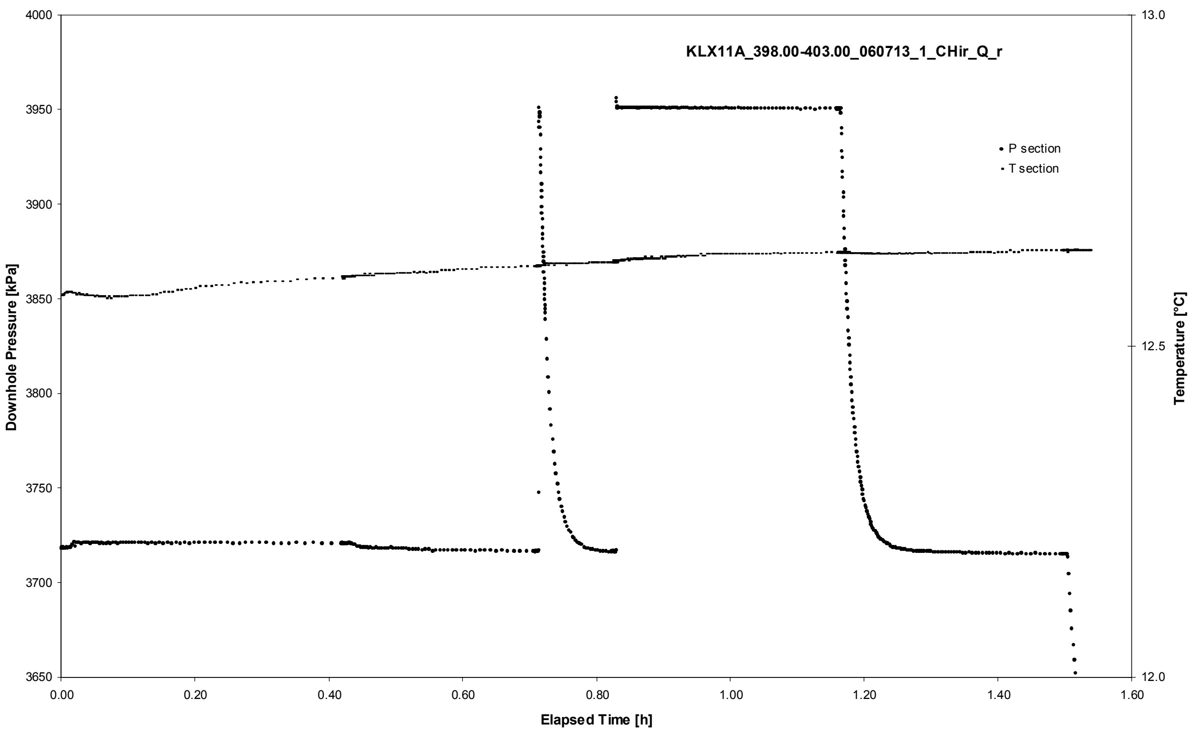
APPENDIX 2-60

Test 398.00 – 403.00 m

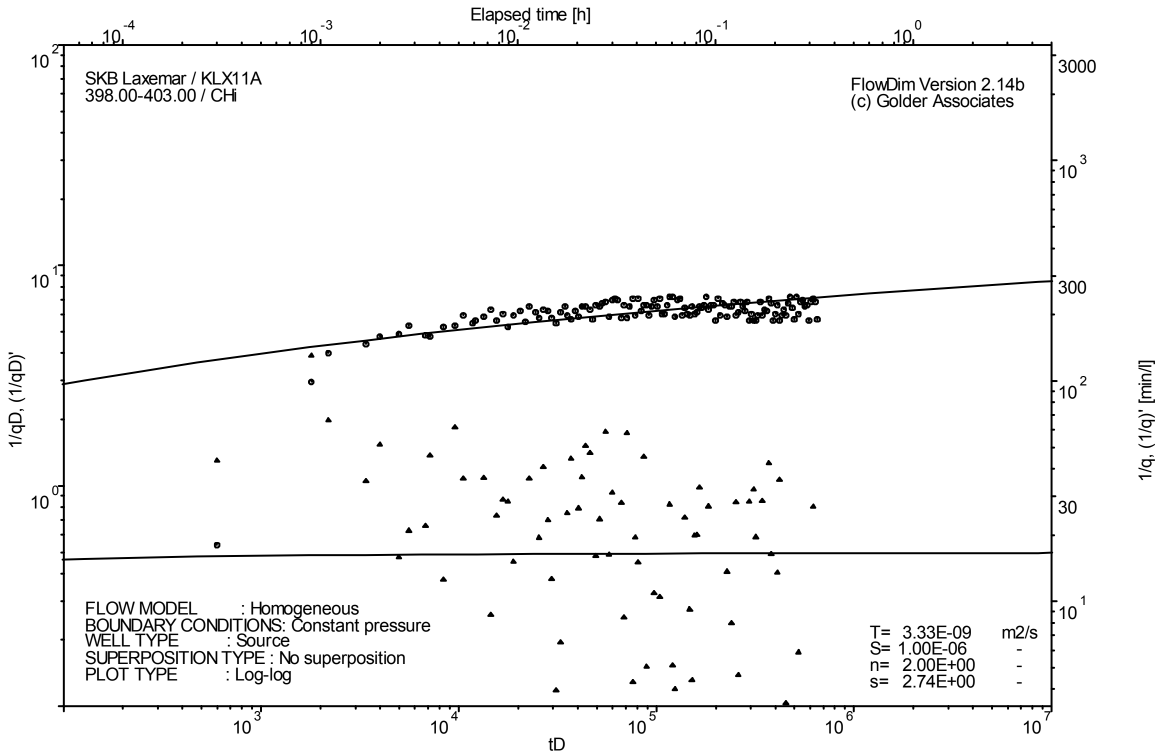
Analysis diagrams



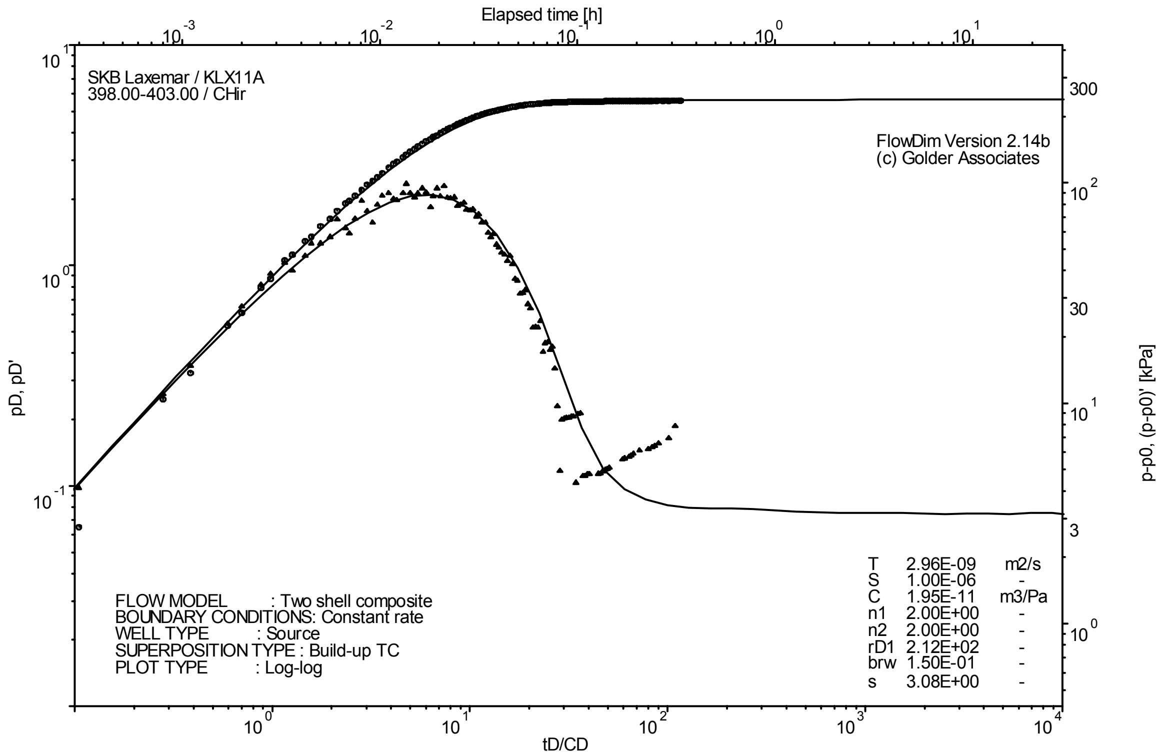
Pressure and flow rate vs. time; cartesian plot



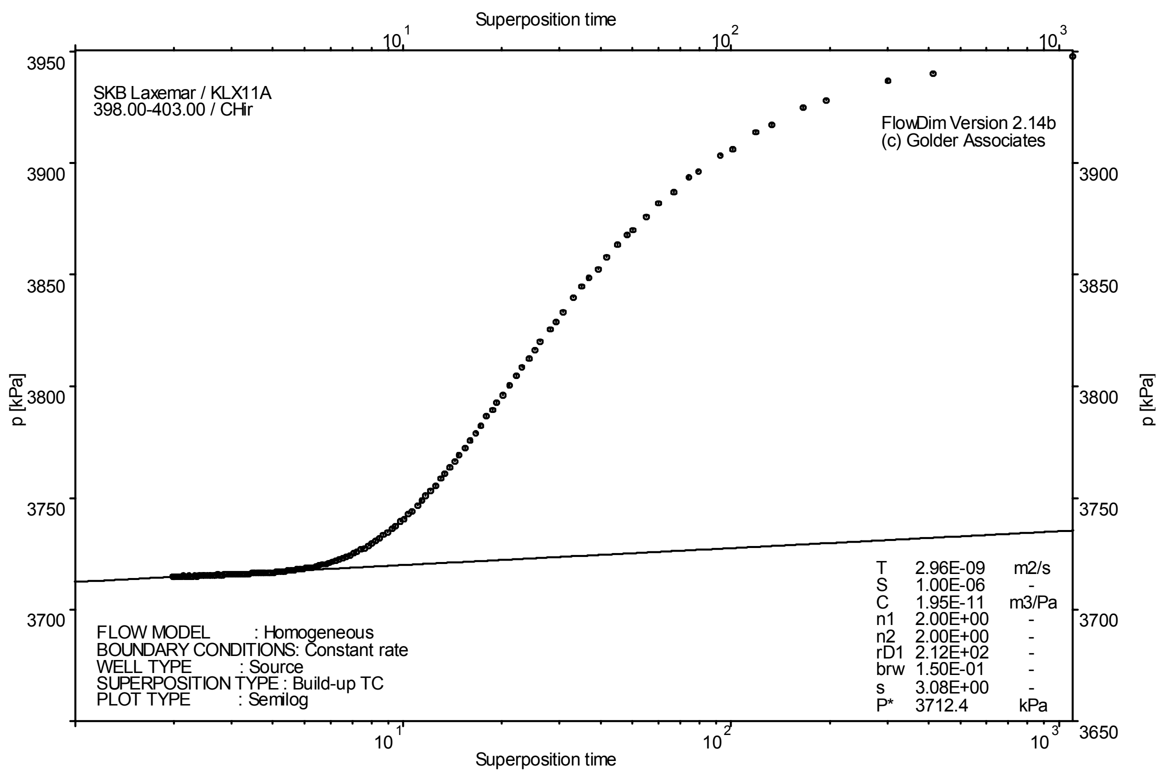
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

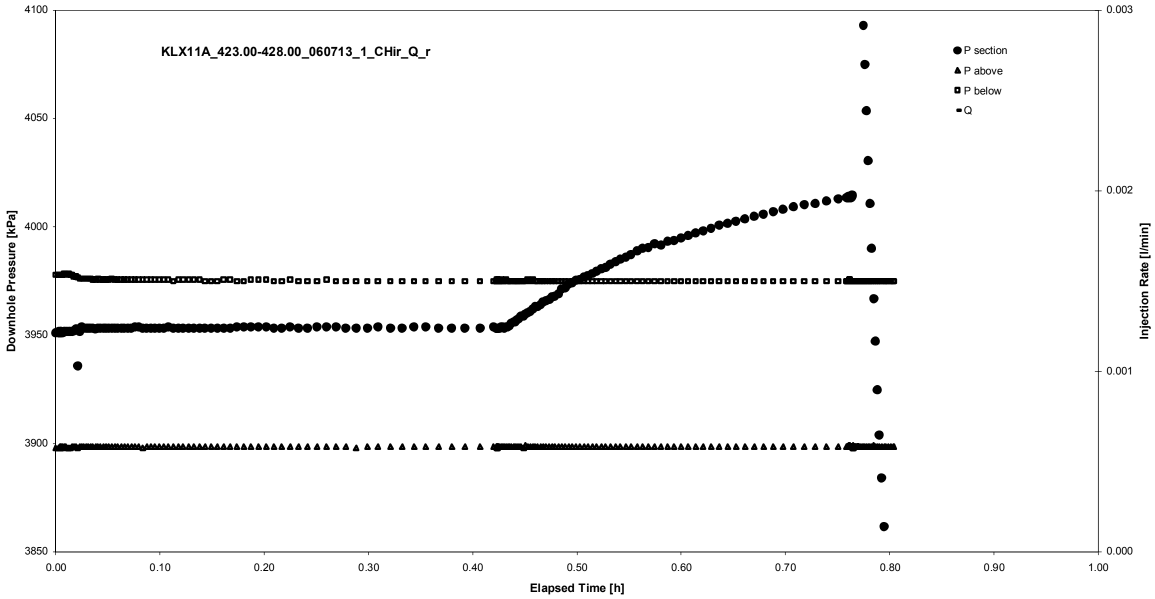


CHIR phase; HORNER match

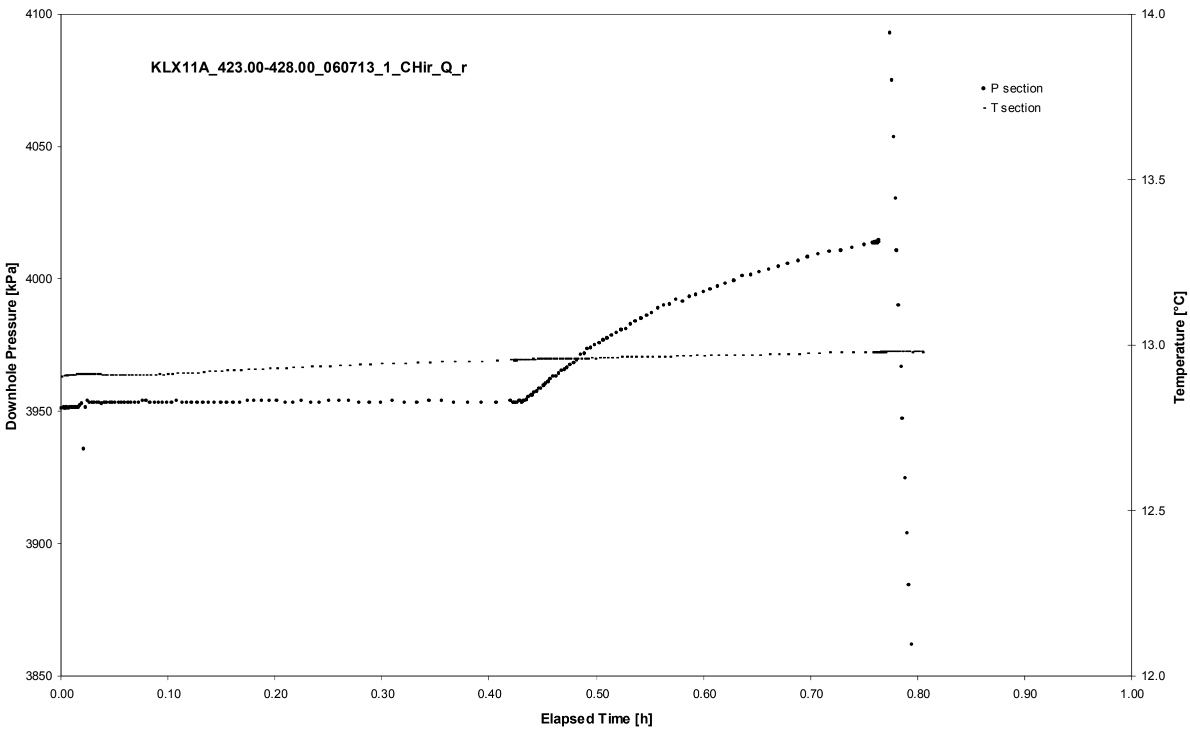
APPENDIX 2-61

Test 423.00 – 428.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

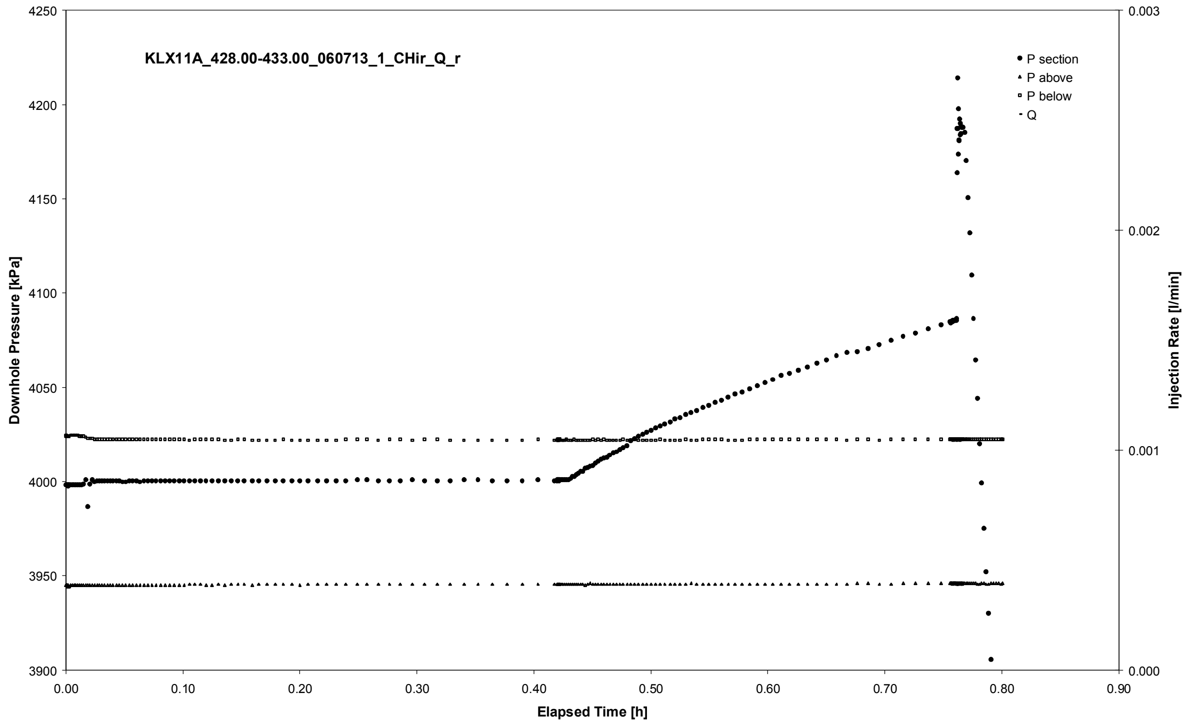
CHIR phase; log-log match

Not analysed

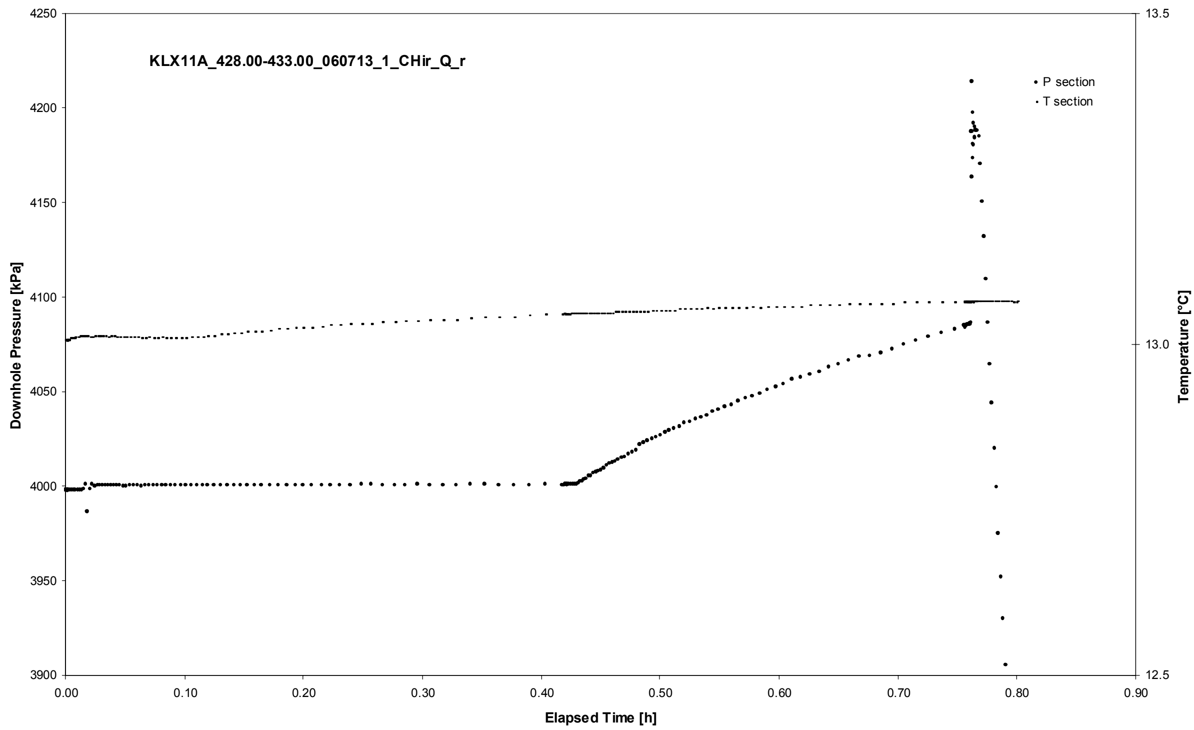
APPENDIX 2-62

Test 428.00 – 433.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

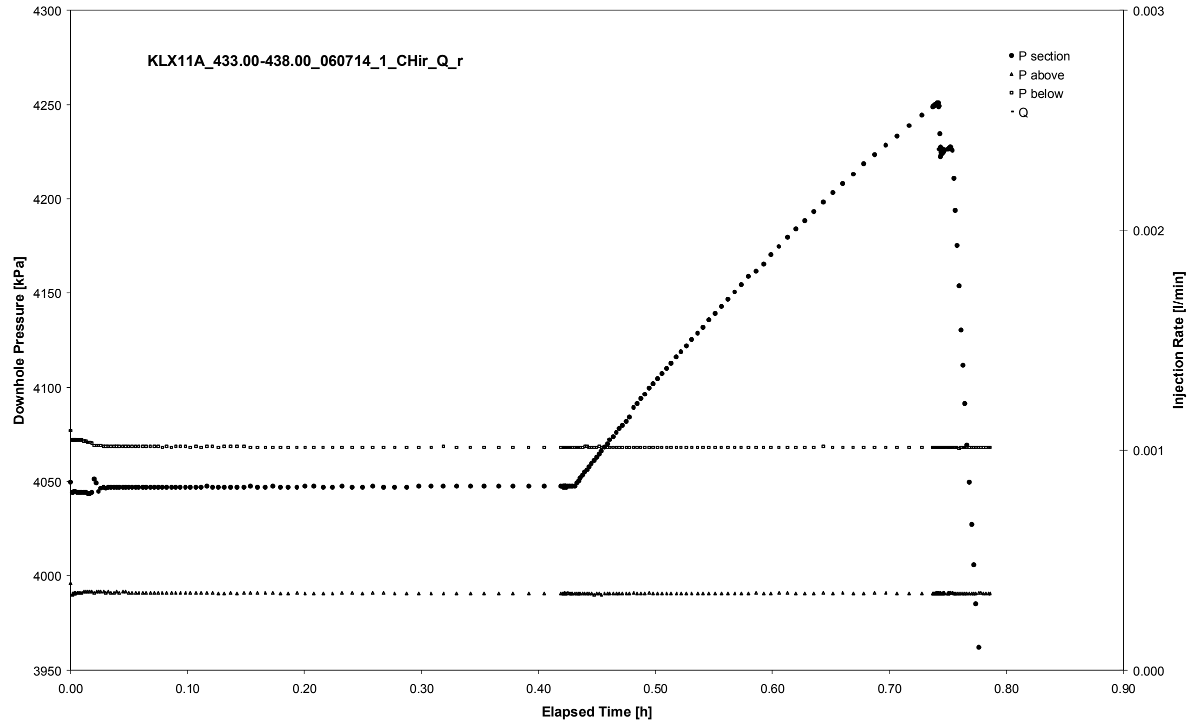
CHIR phase; log-log match

Not analysed

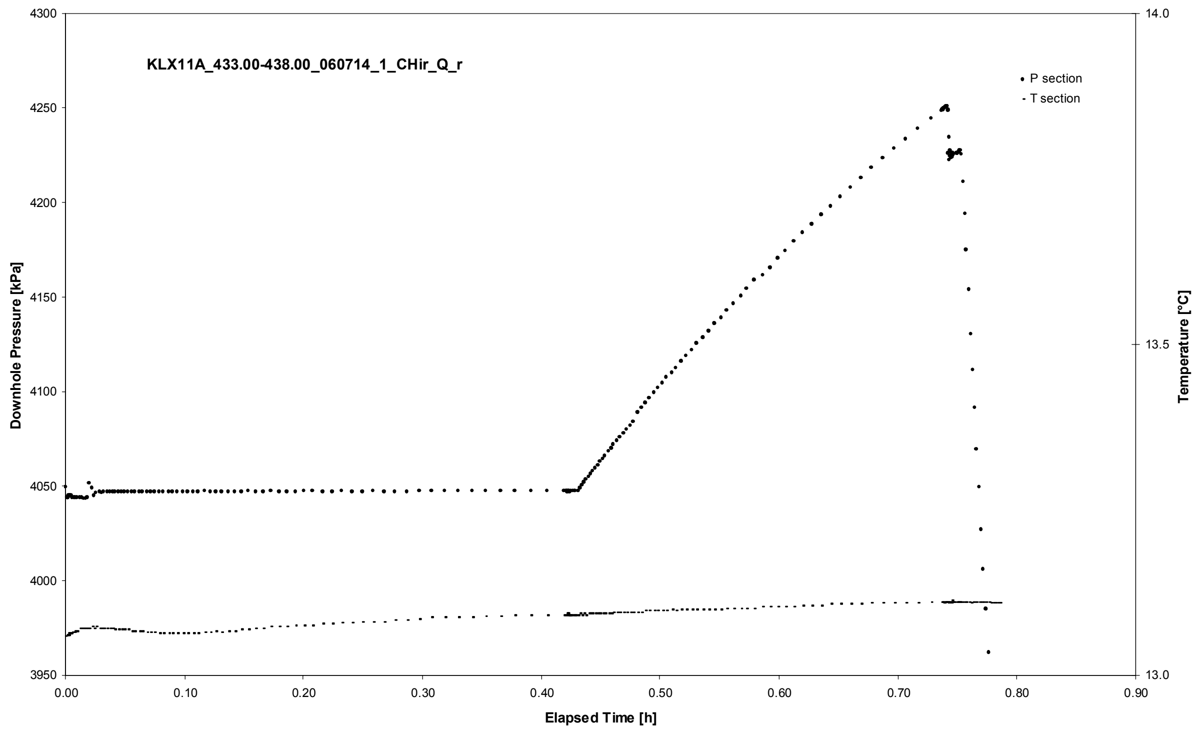
APPENDIX 2-63

Test 433.00 – 438.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

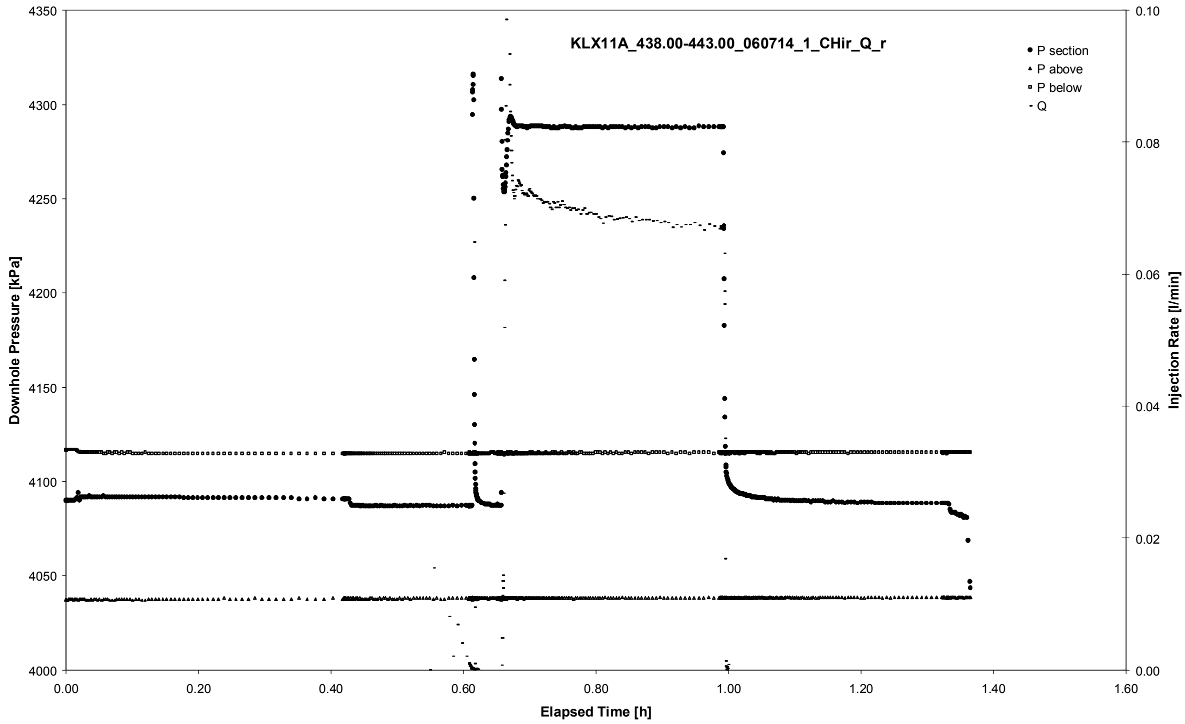
CHIR phase; log-log match

Not analysed

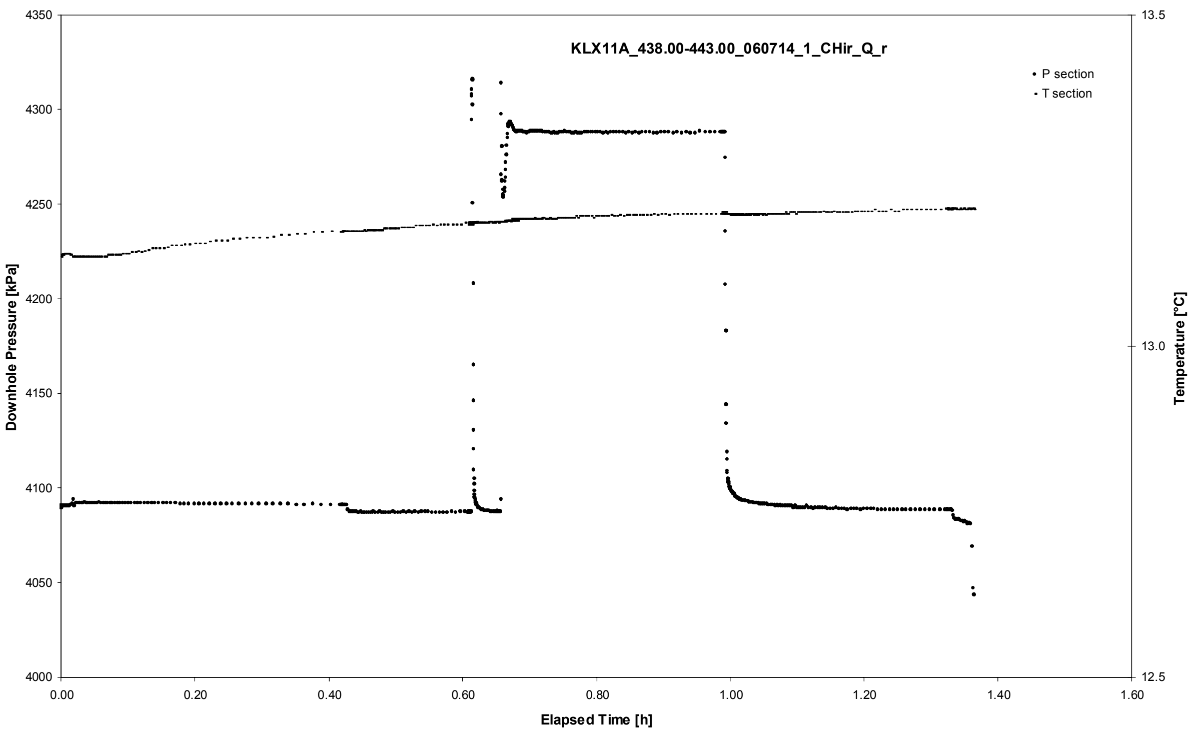
APPENDIX 2-64

Test 438.00 – 443.00 m

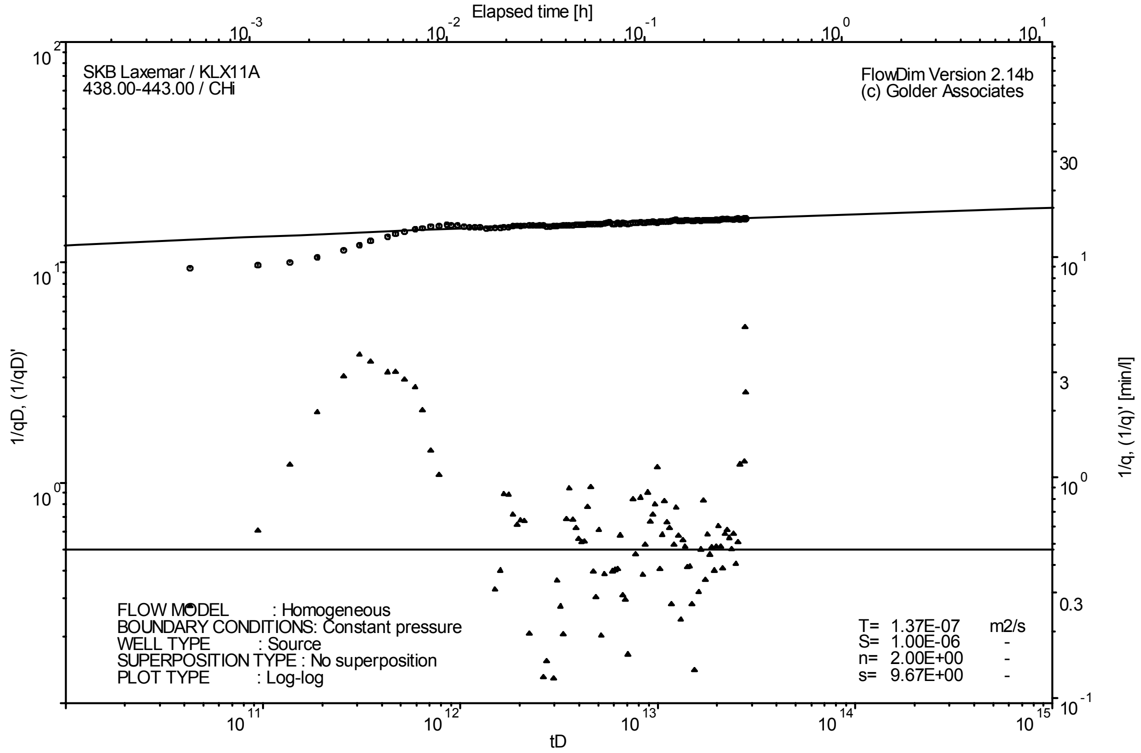
Analysis diagrams



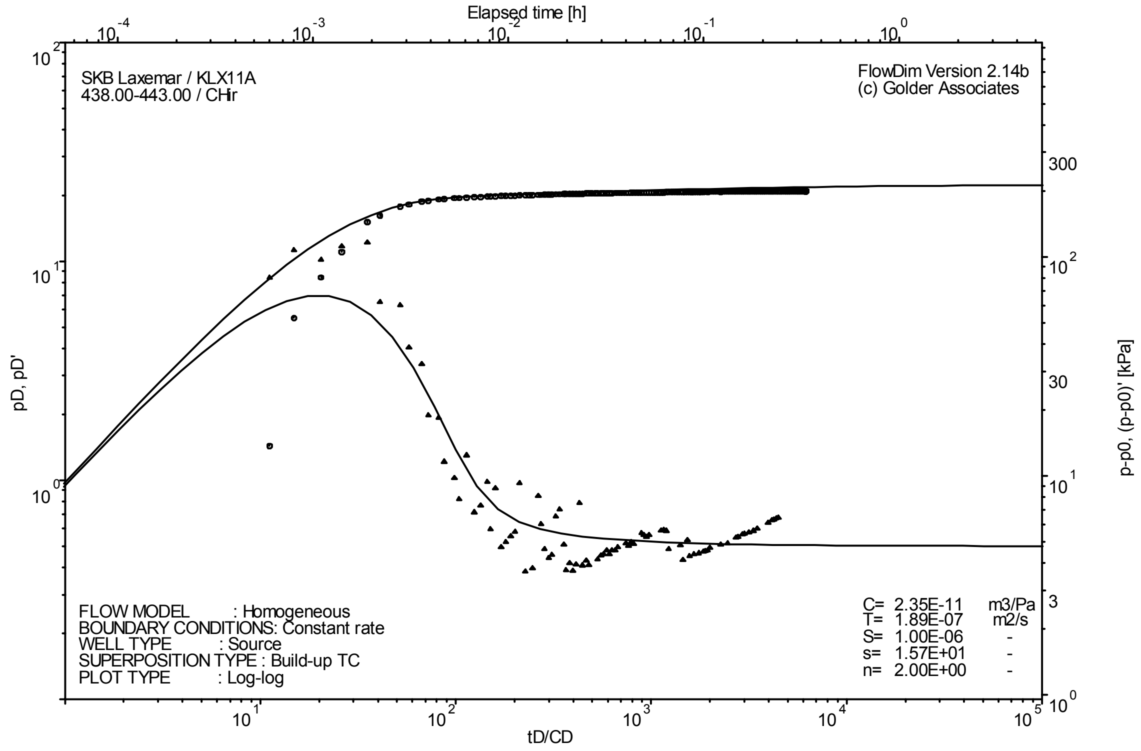
Pressure and flow rate vs. time; cartesian plot



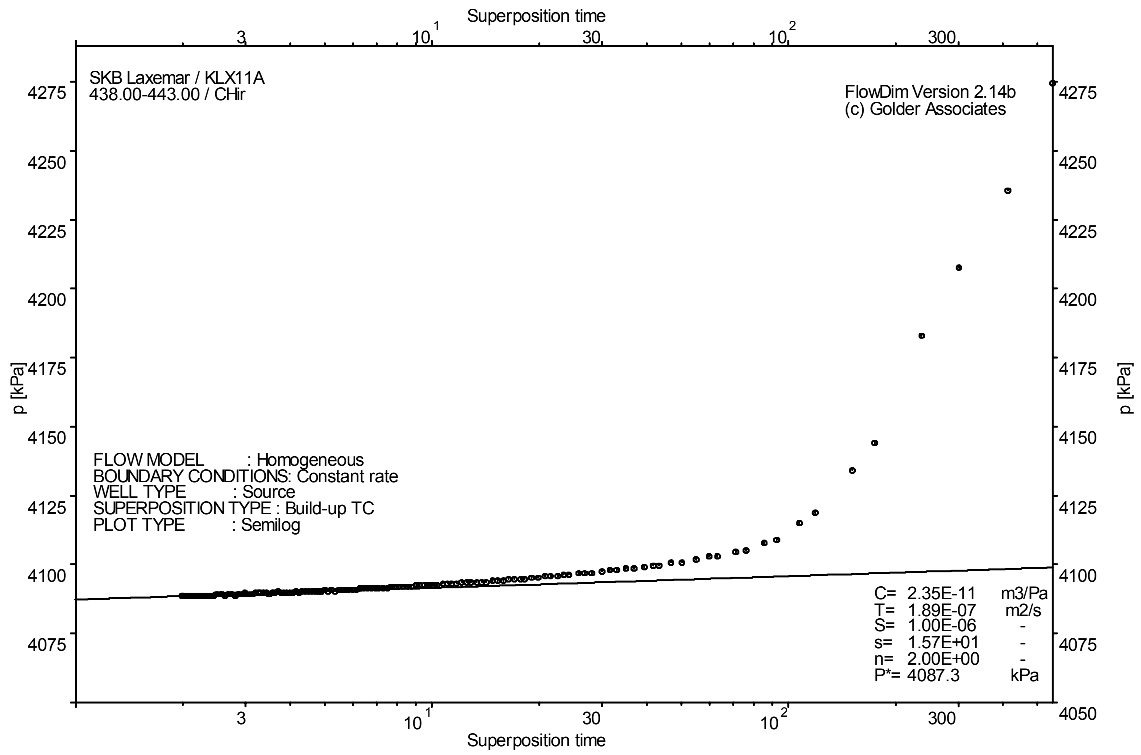
Interval pressure and temperature vs. time; cartesian plot



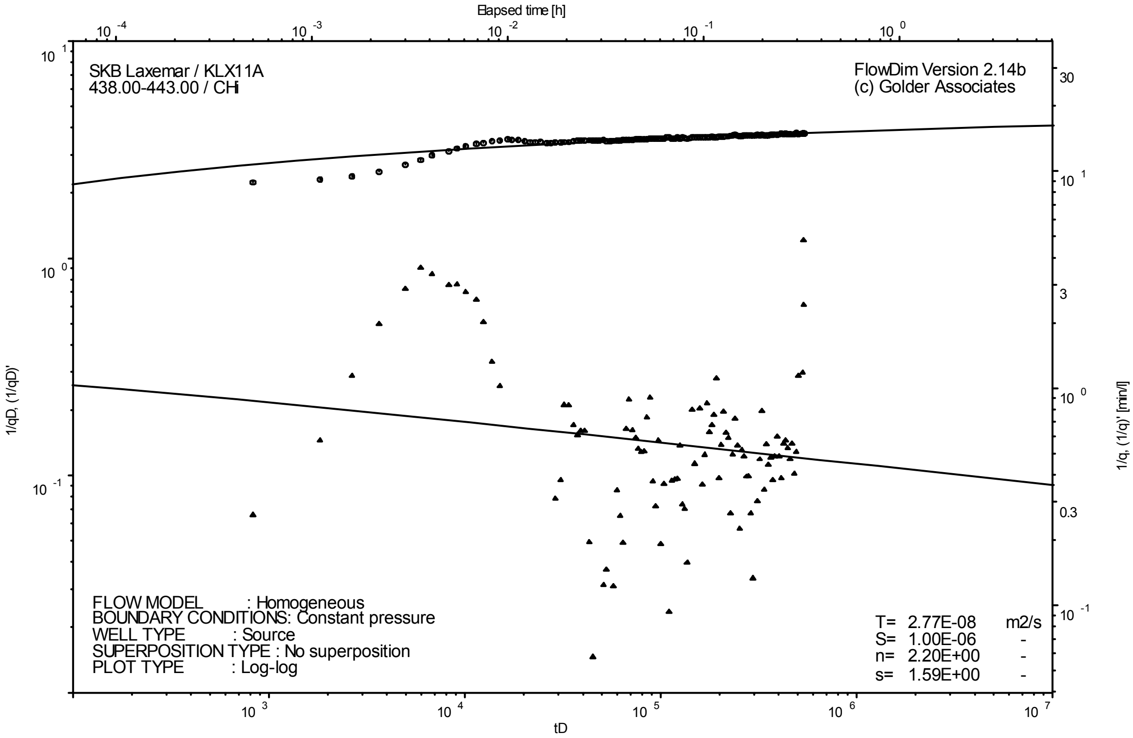
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

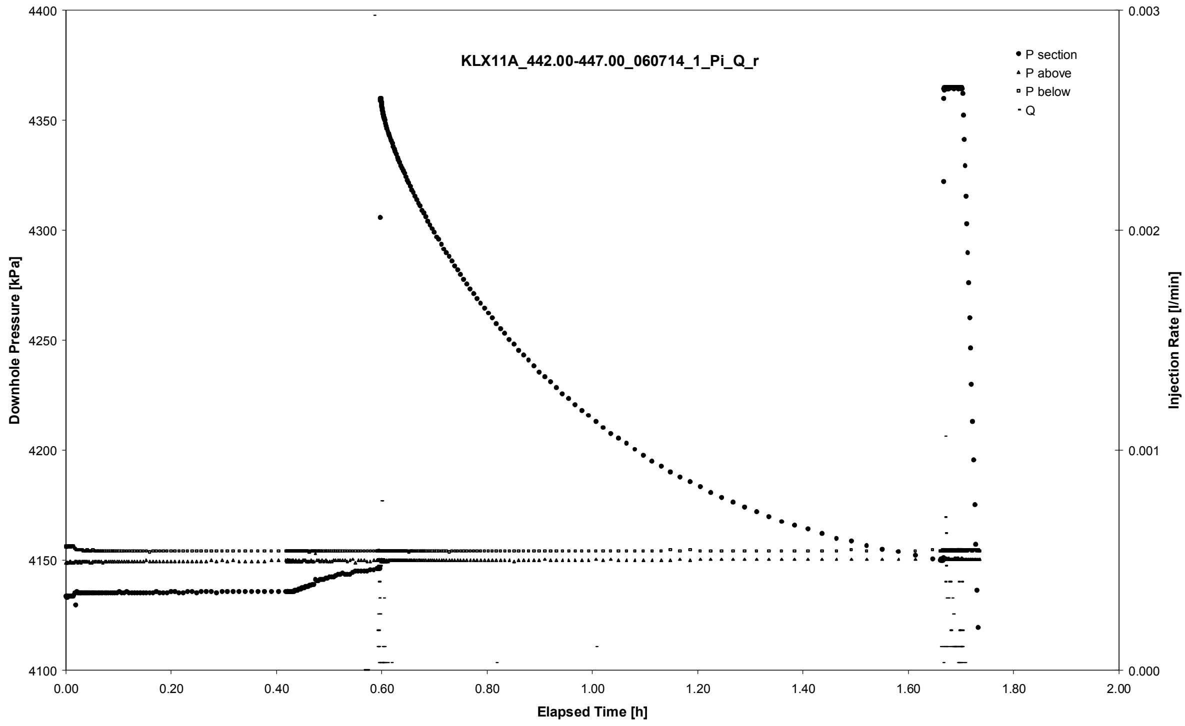


CHI phase; log-log match (n=2.2)

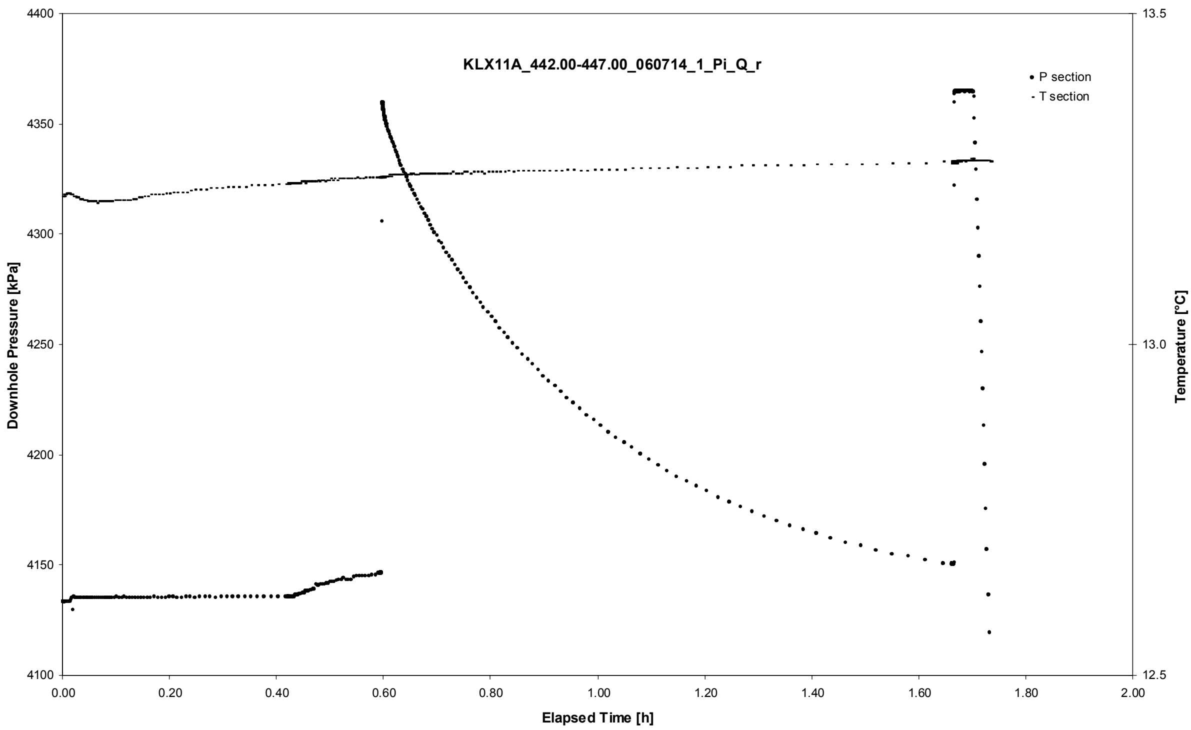
APPENDIX 2-65

Test 442.00 – 447.00 m

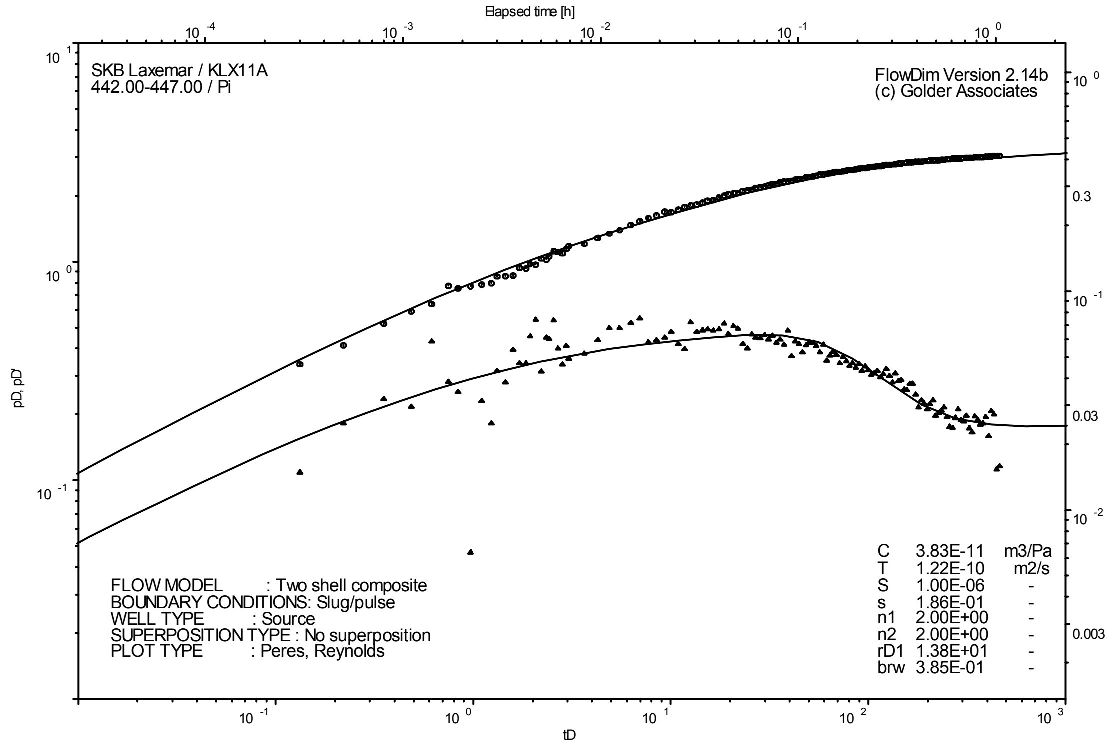
Analysis diagrams



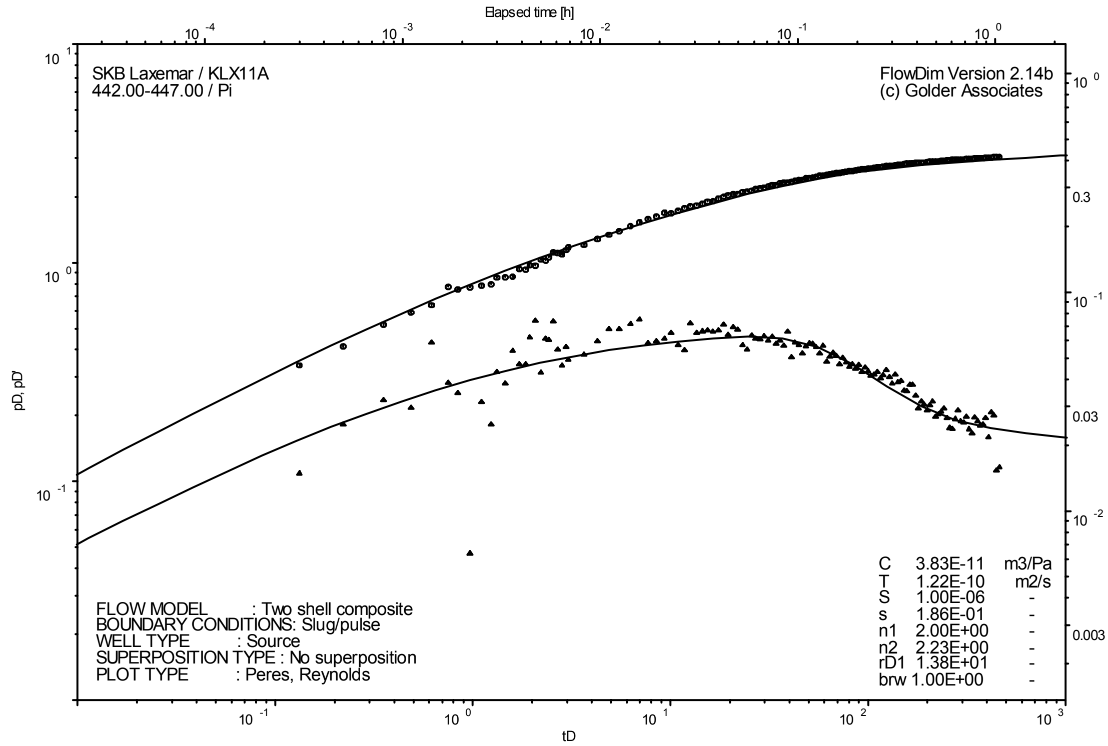
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



Pulse injection; deconvolution match

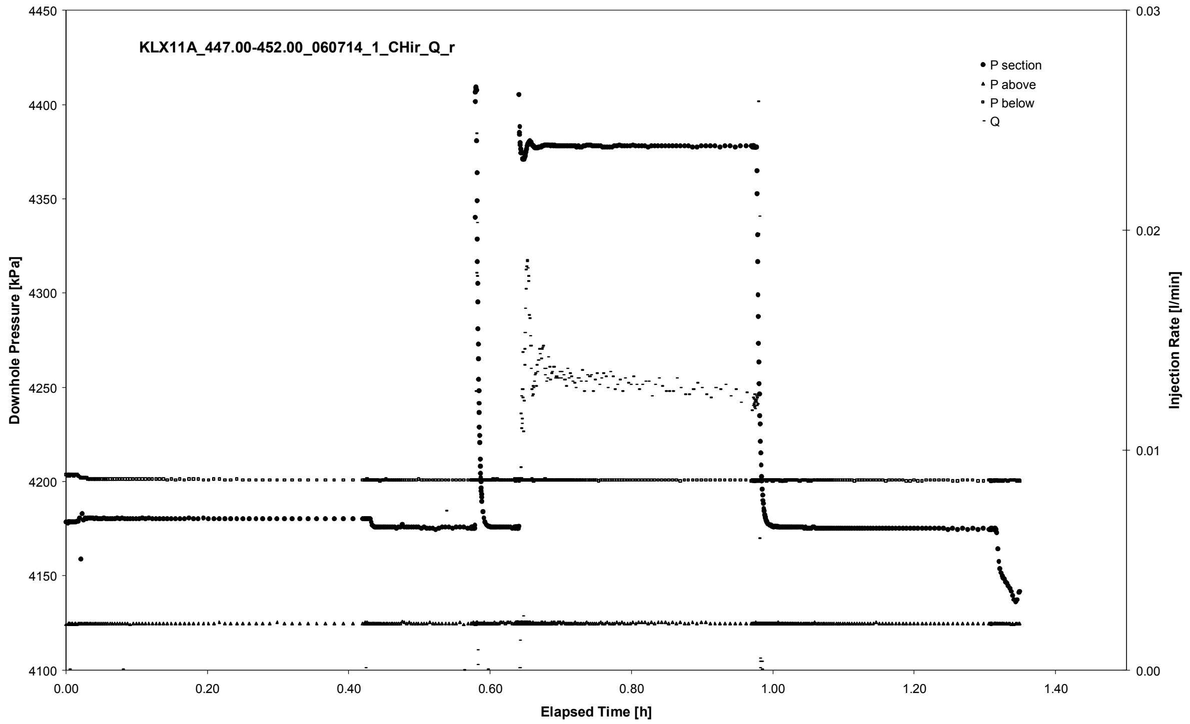


Pulse injection; deconvolution match (n1=2, n2=2.23)

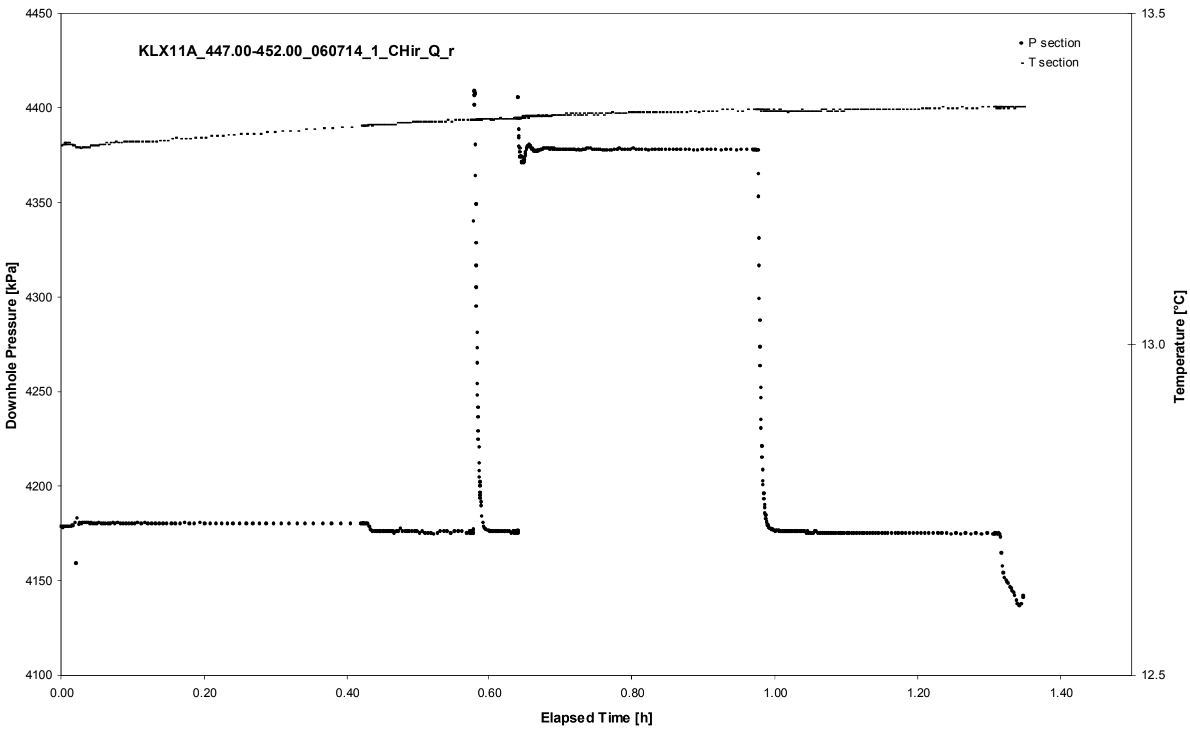
APPENDIX 2-66

Test 447.00 – 452.00 m

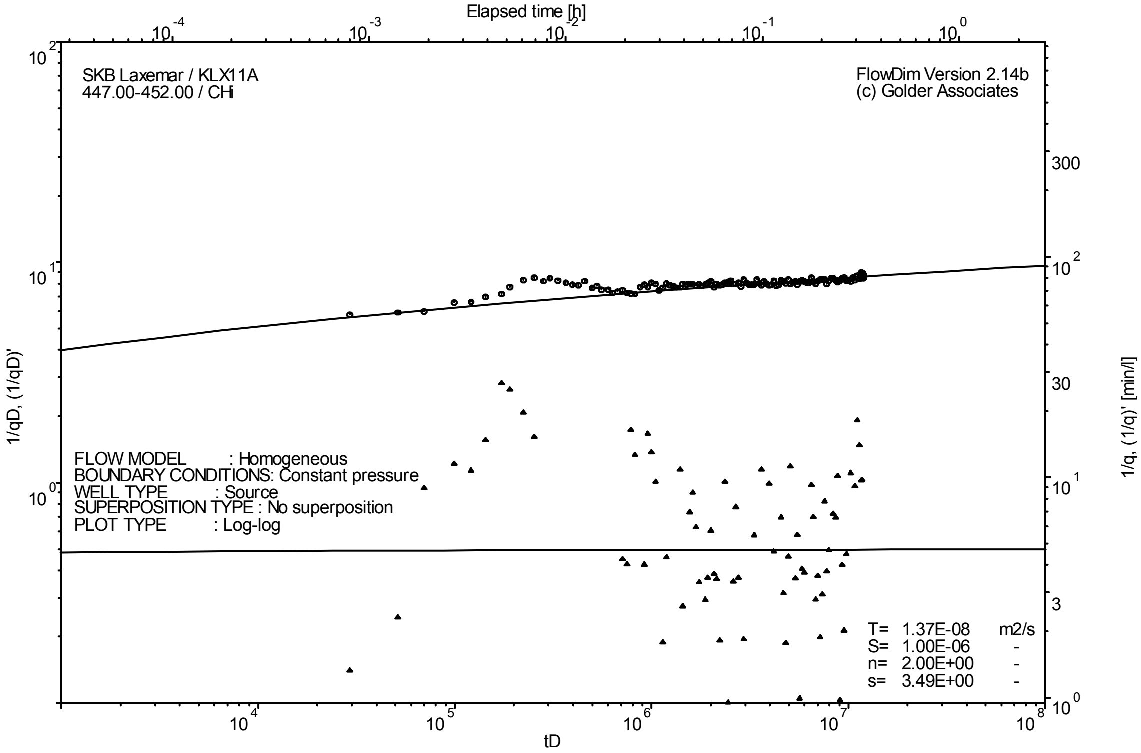
Analysis diagrams



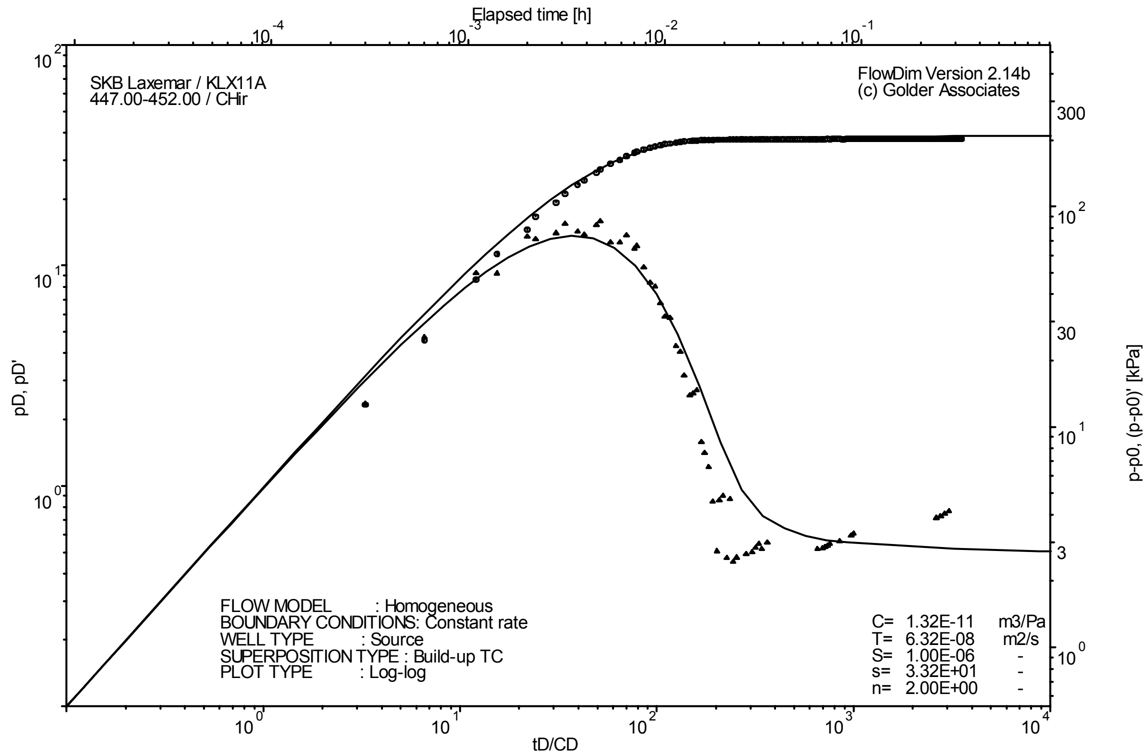
Pressure and flow rate vs. time; cartesian plot



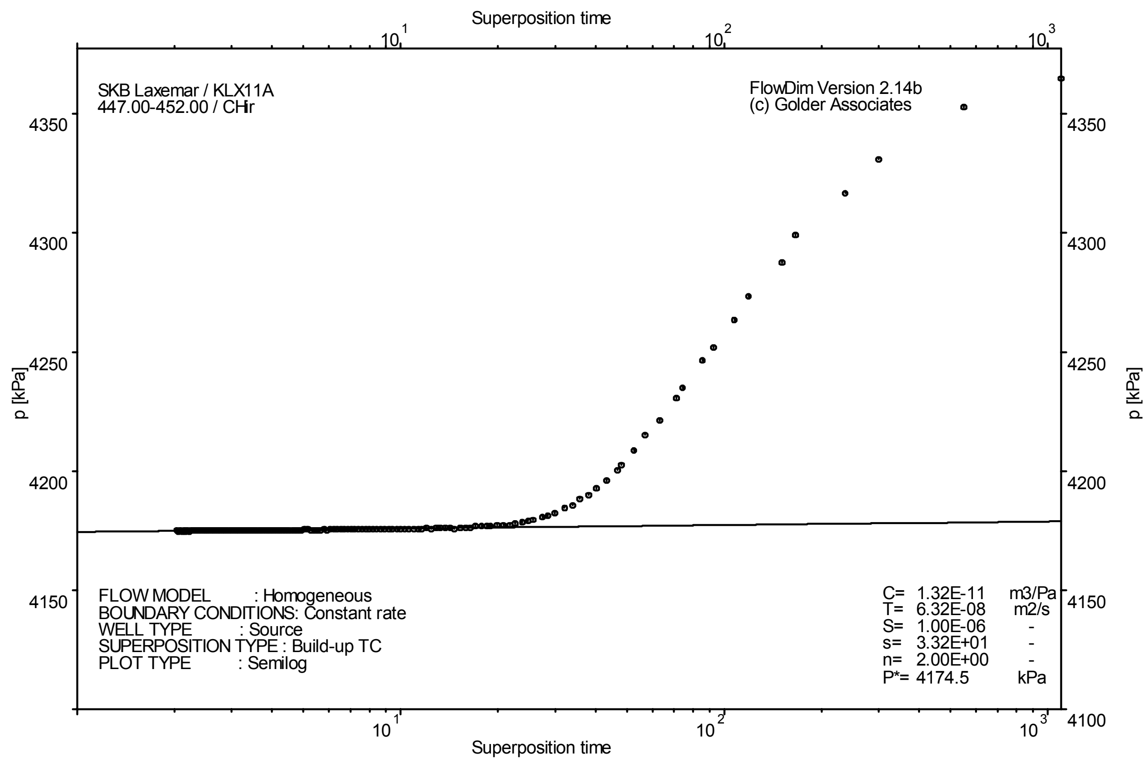
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

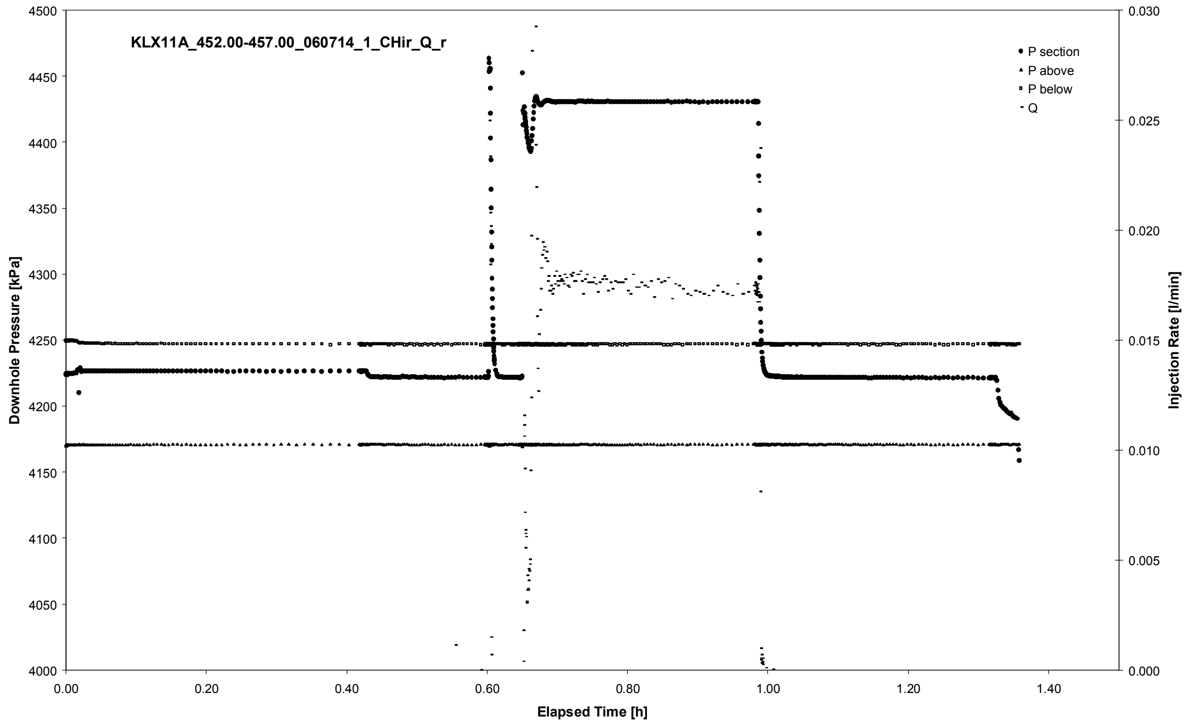


CHIR phase; HORNER match

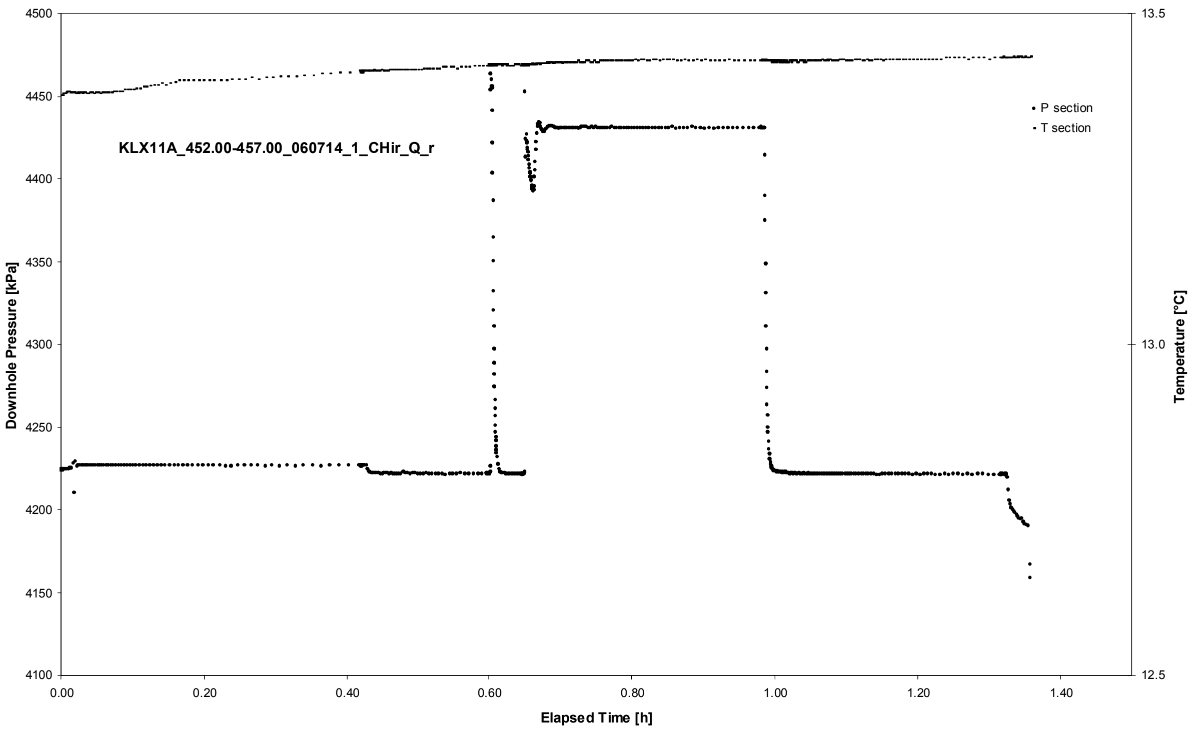
APPENDIX 2-67

Test 452.00 – 457.00 m

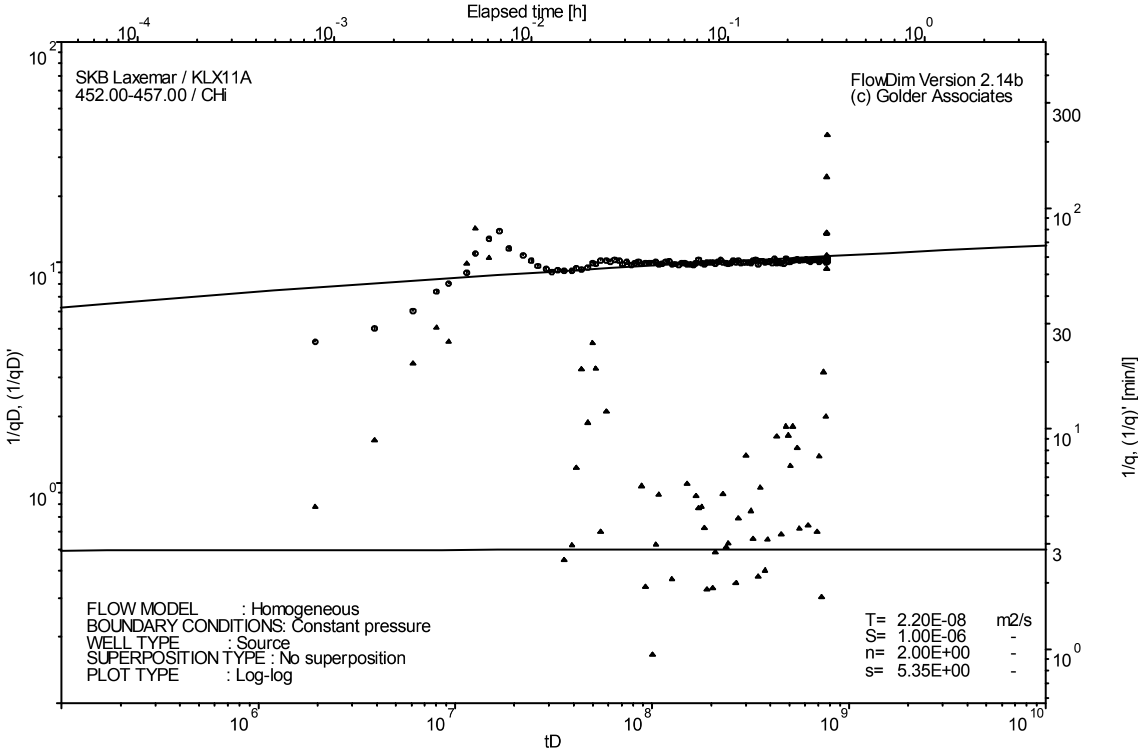
Analysis diagrams



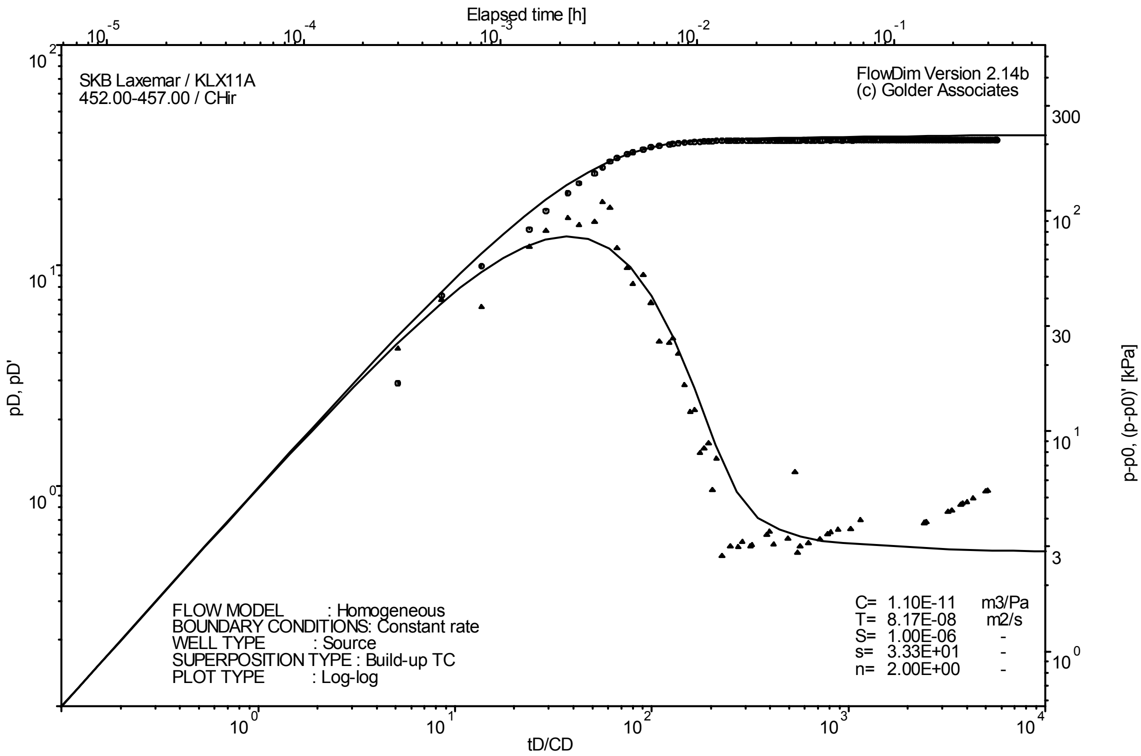
Pressure and flow rate vs. time; cartesian plot



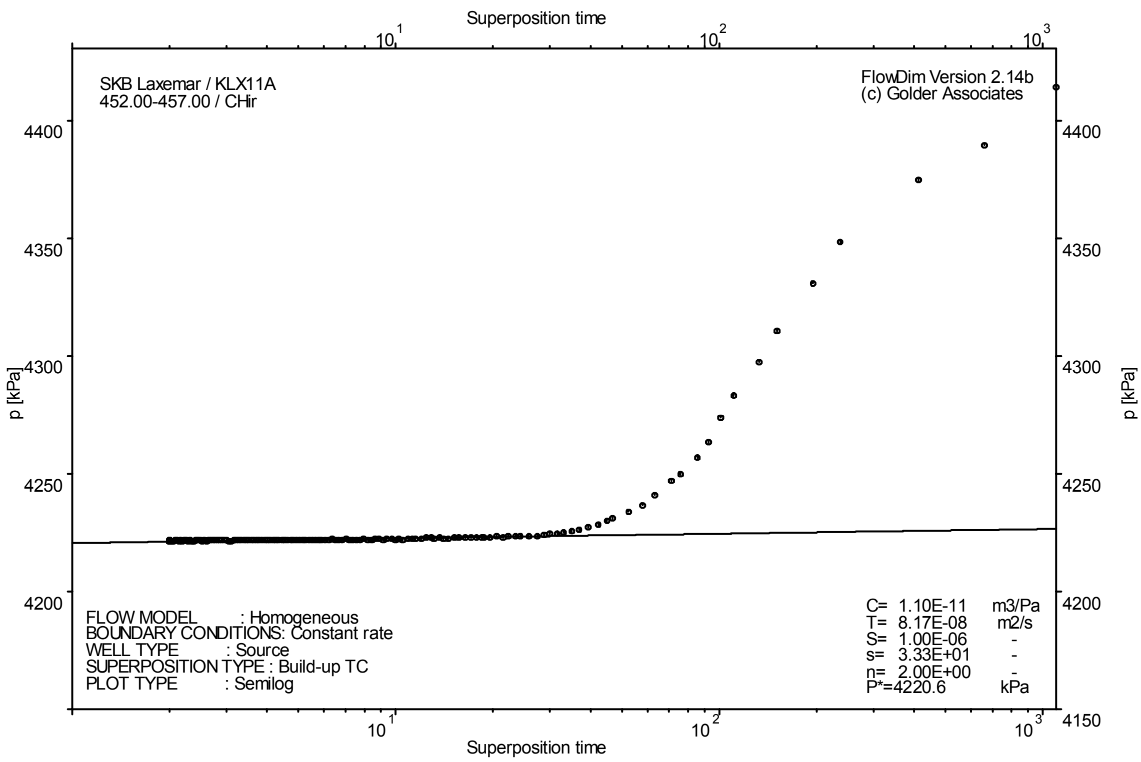
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

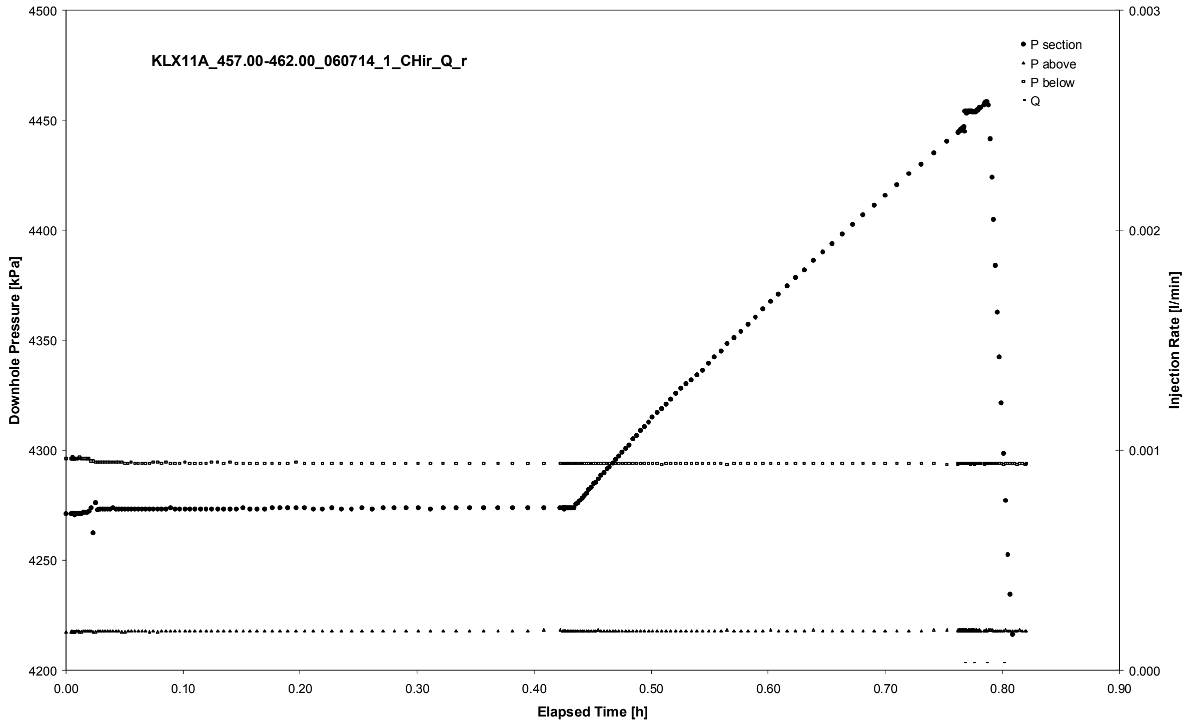


CHIR phase; HORNER match

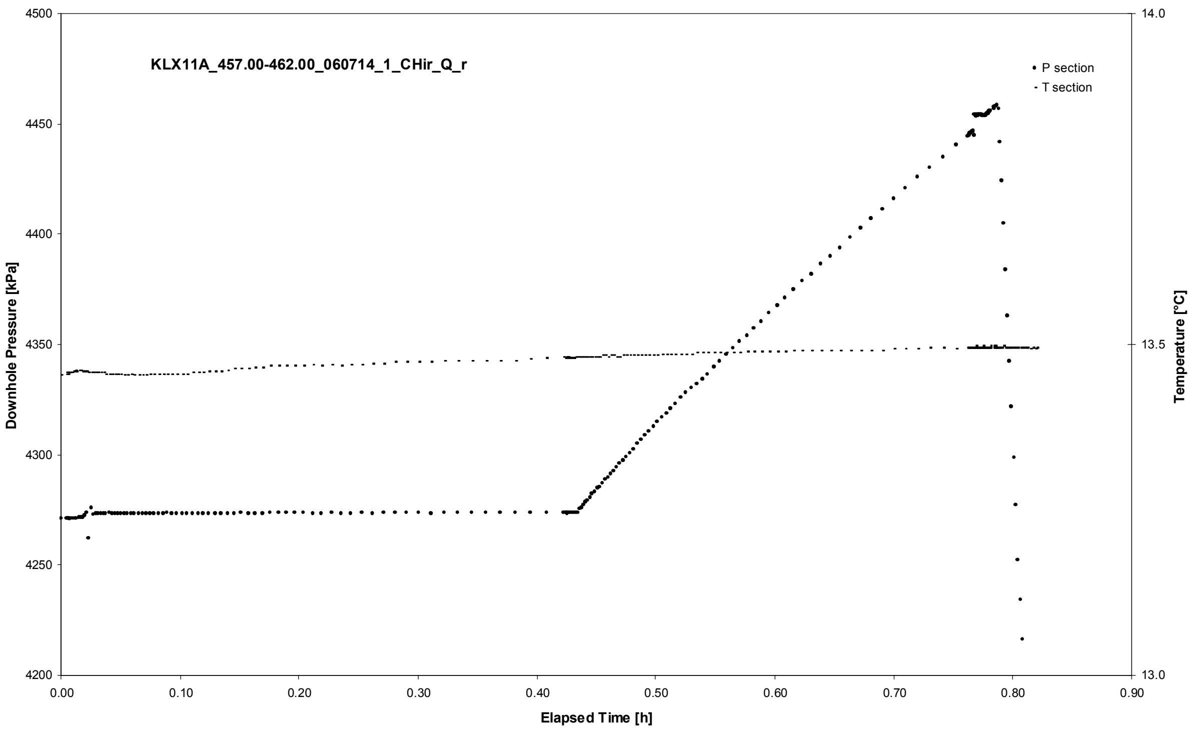
APPENDIX 2-68

Test 457.00 – 462.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

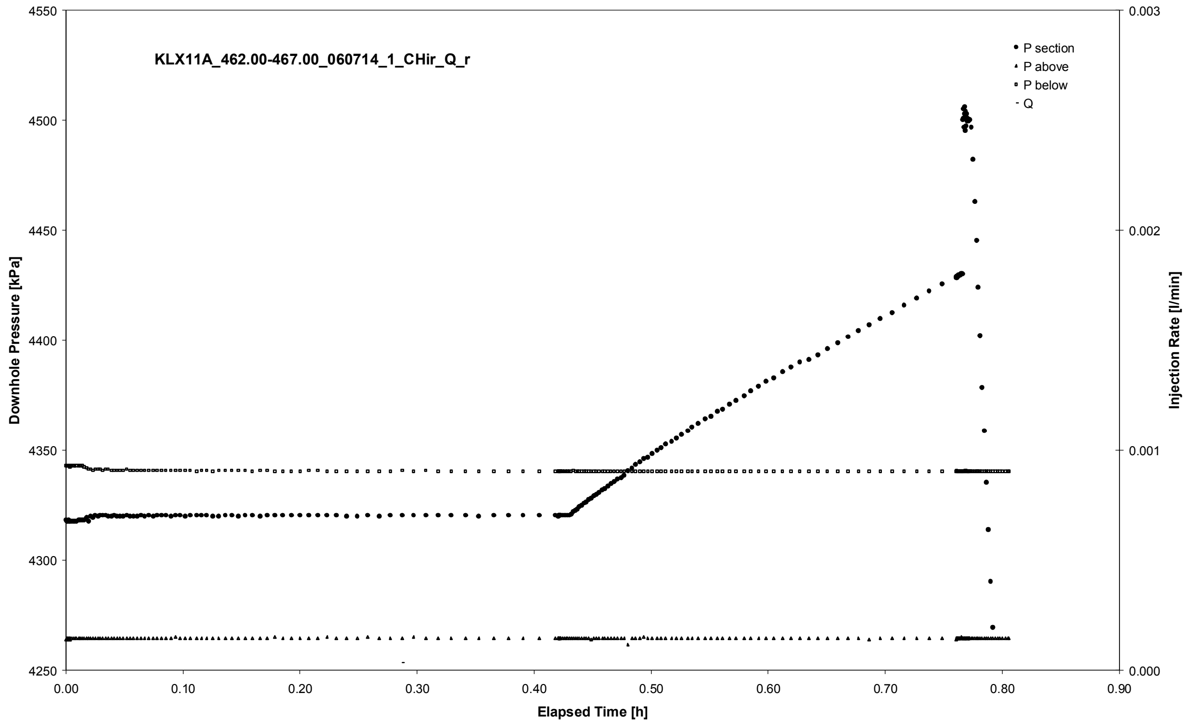
CHIR phase; log-log match

Not analysed

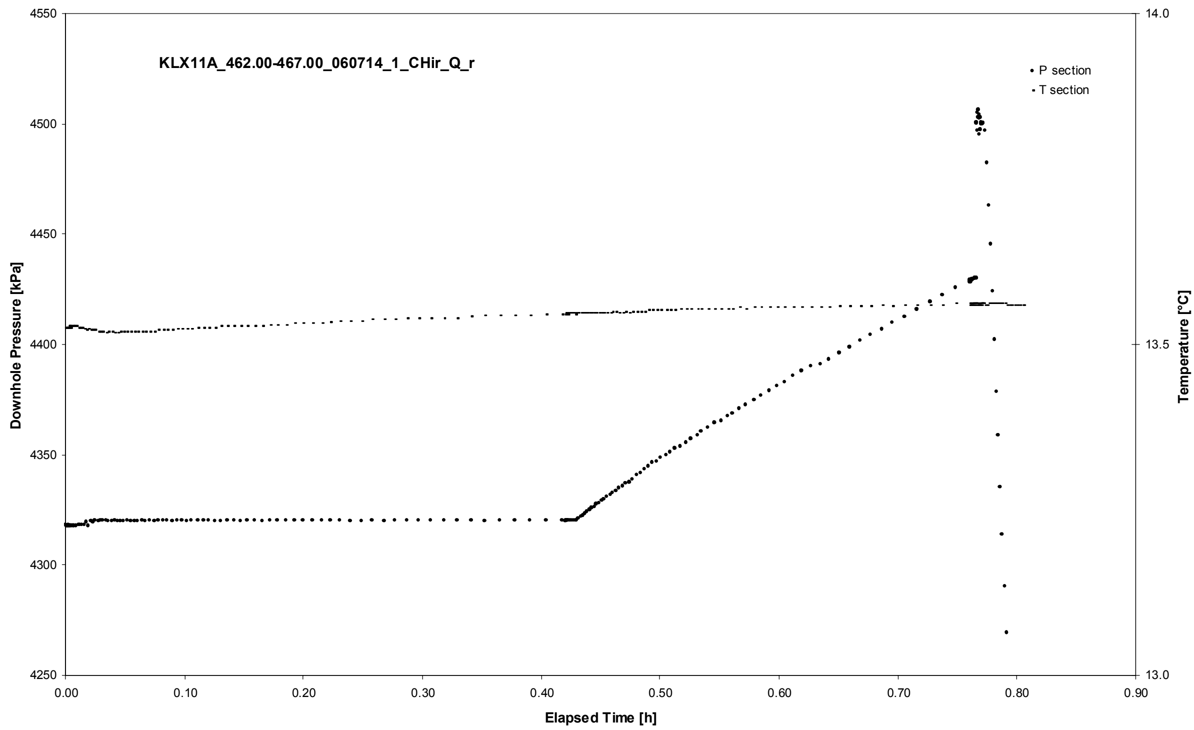
APPENDIX 2-69

Test 462.00 – 467.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

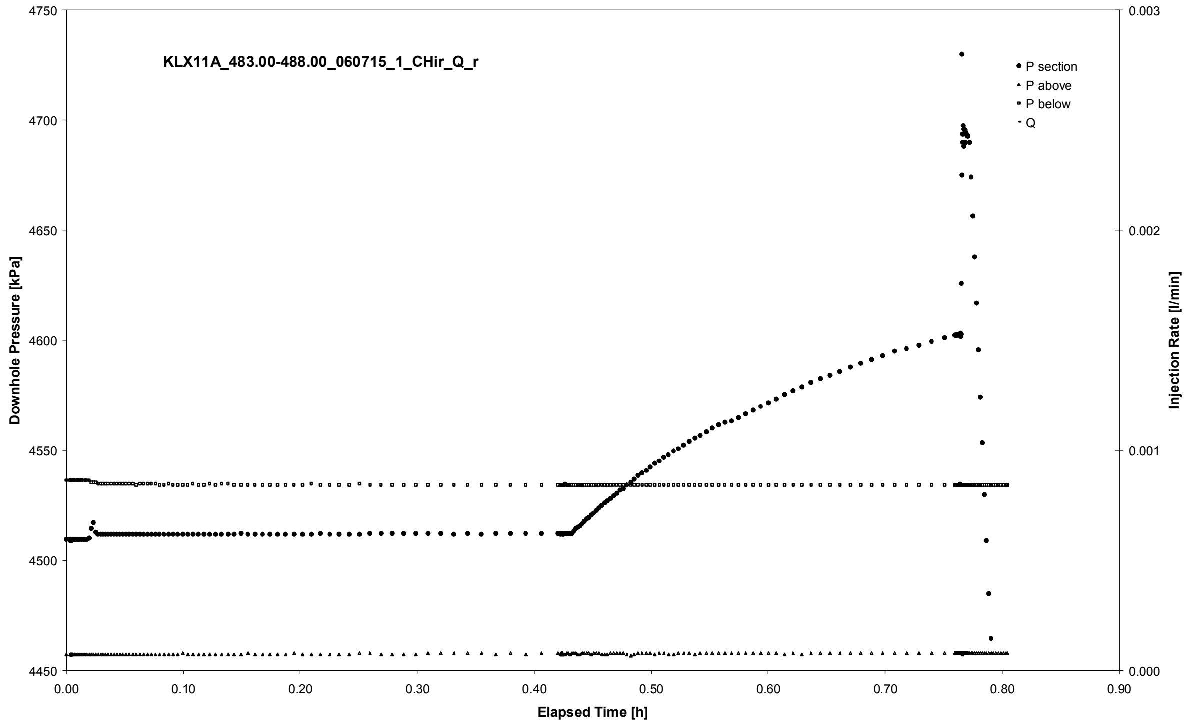
CHIR phase; log-log match

Not analysed

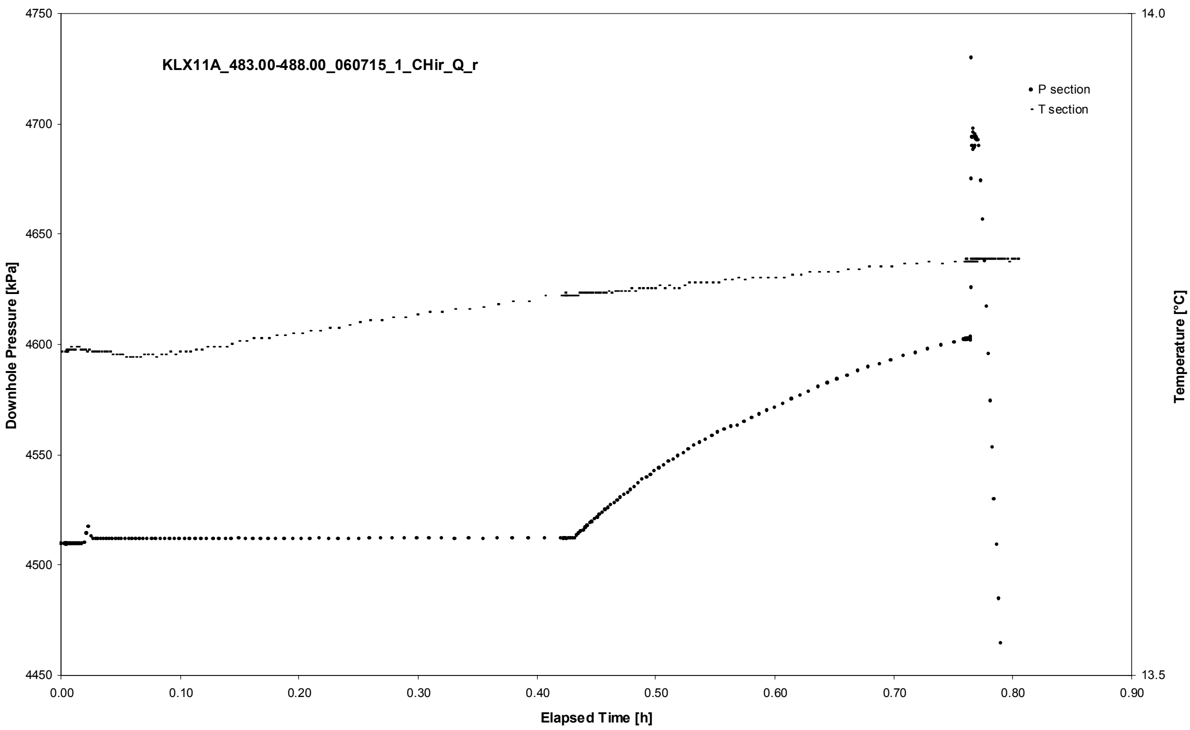
APPENDIX 2-70

Test 483.00 – 488.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

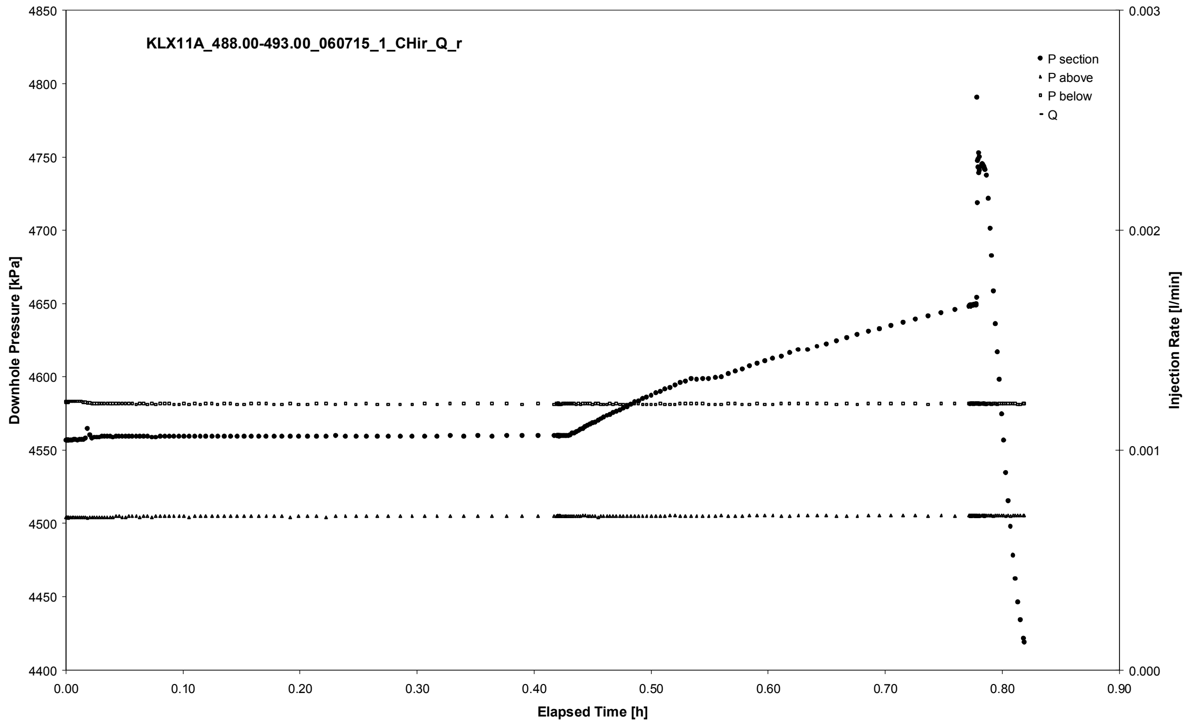
CHIR phase; log-log match

Not analysed

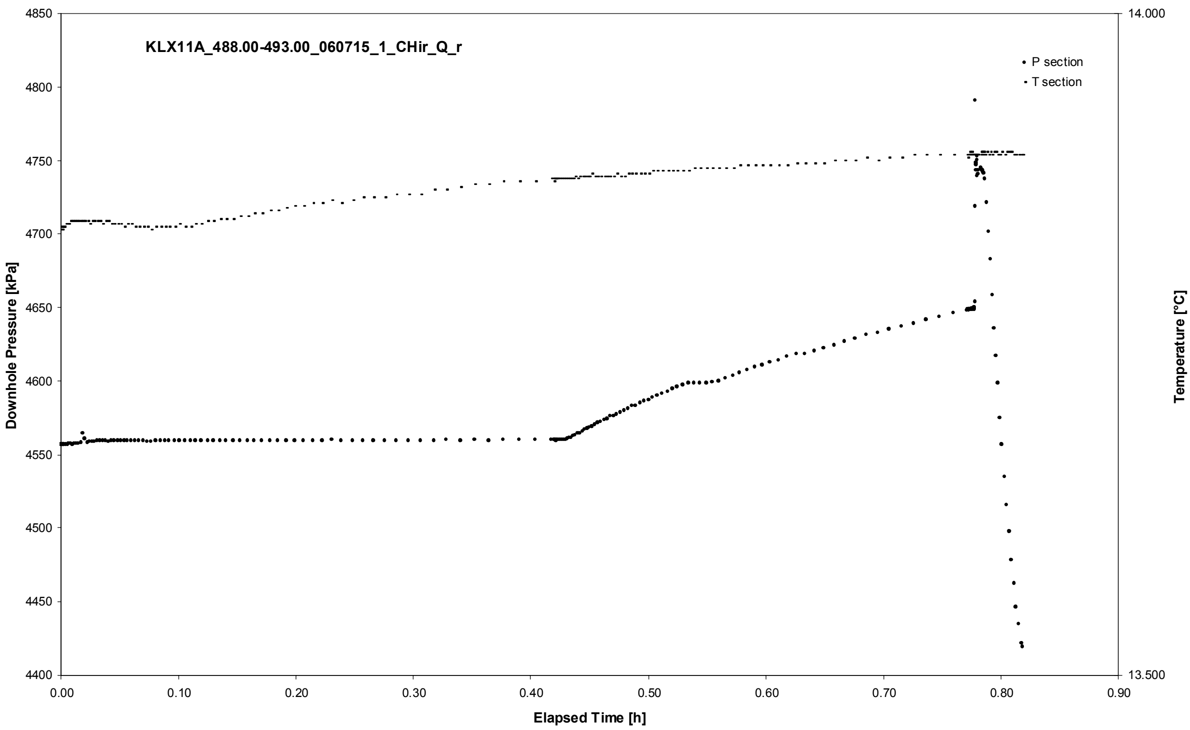
APPENDIX 2-71

Test 488.00 – 493.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

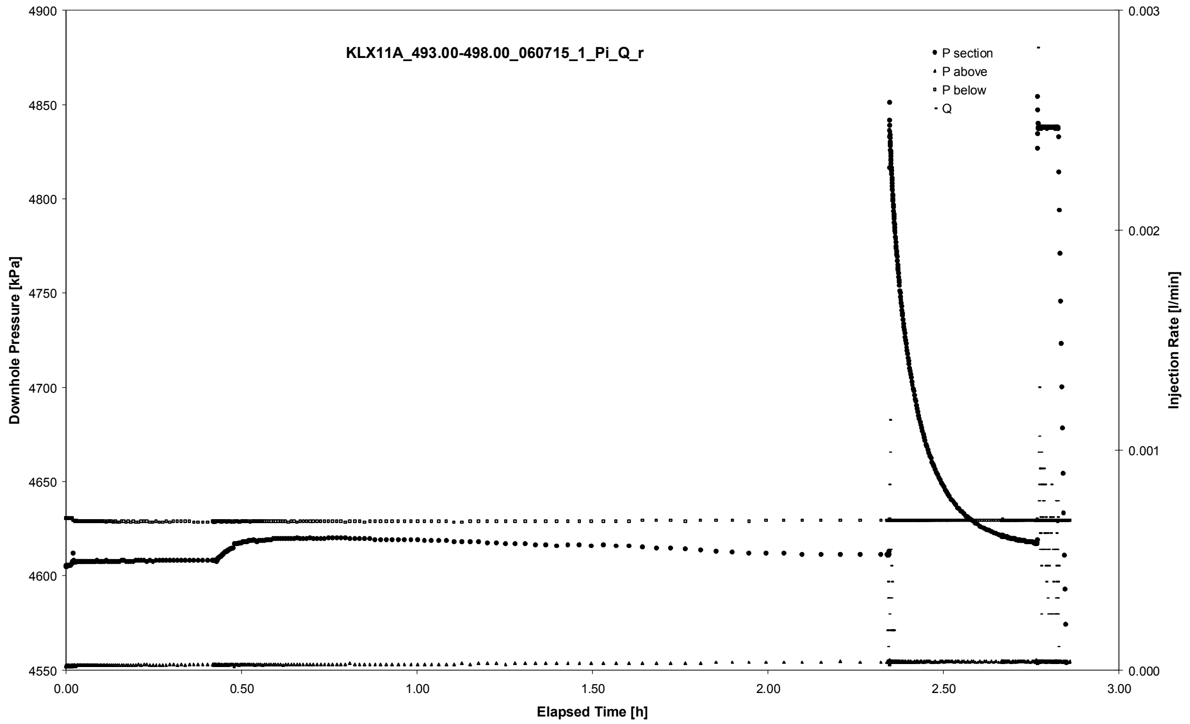
CHIR phase; log-log match

Not analysed

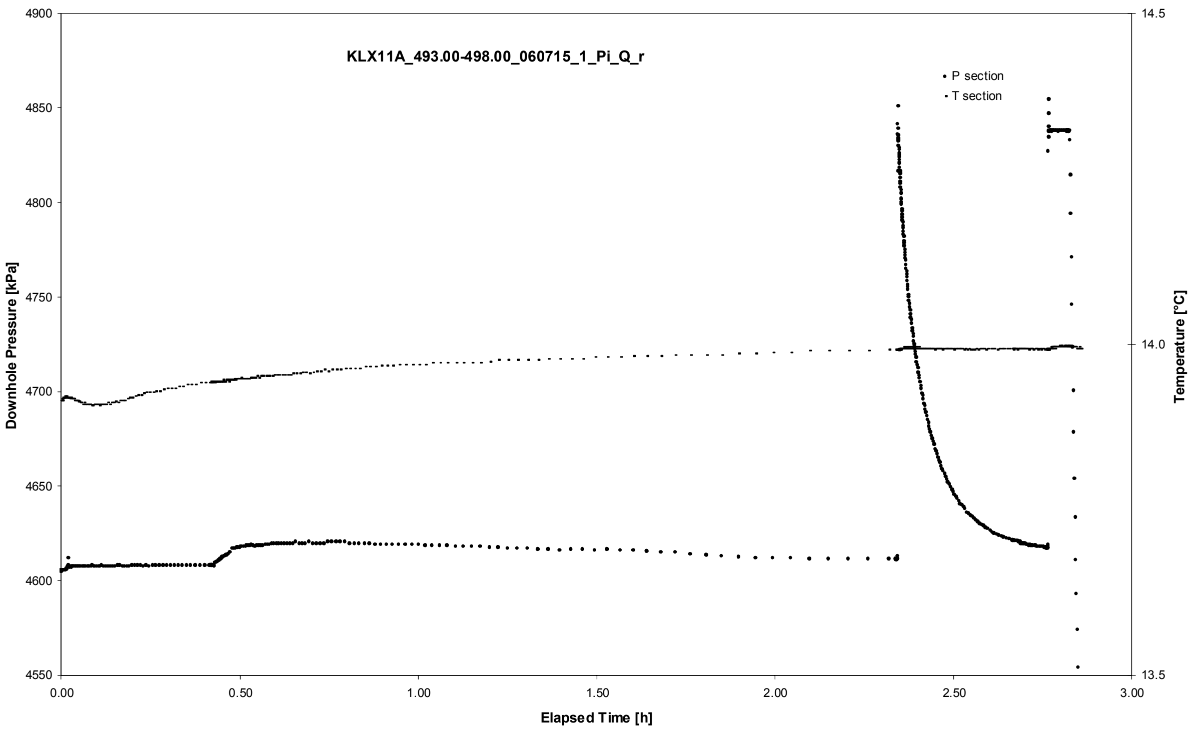
APPENDIX 2-72

Test 493.00 – 498.00 m

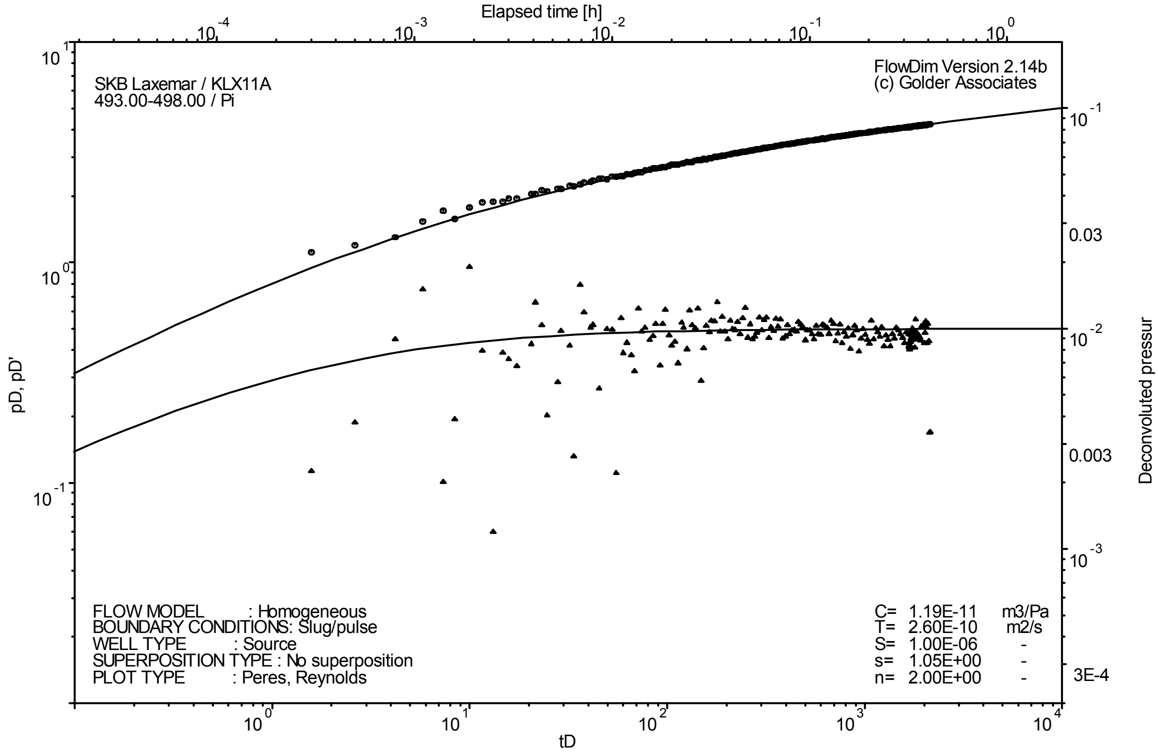
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

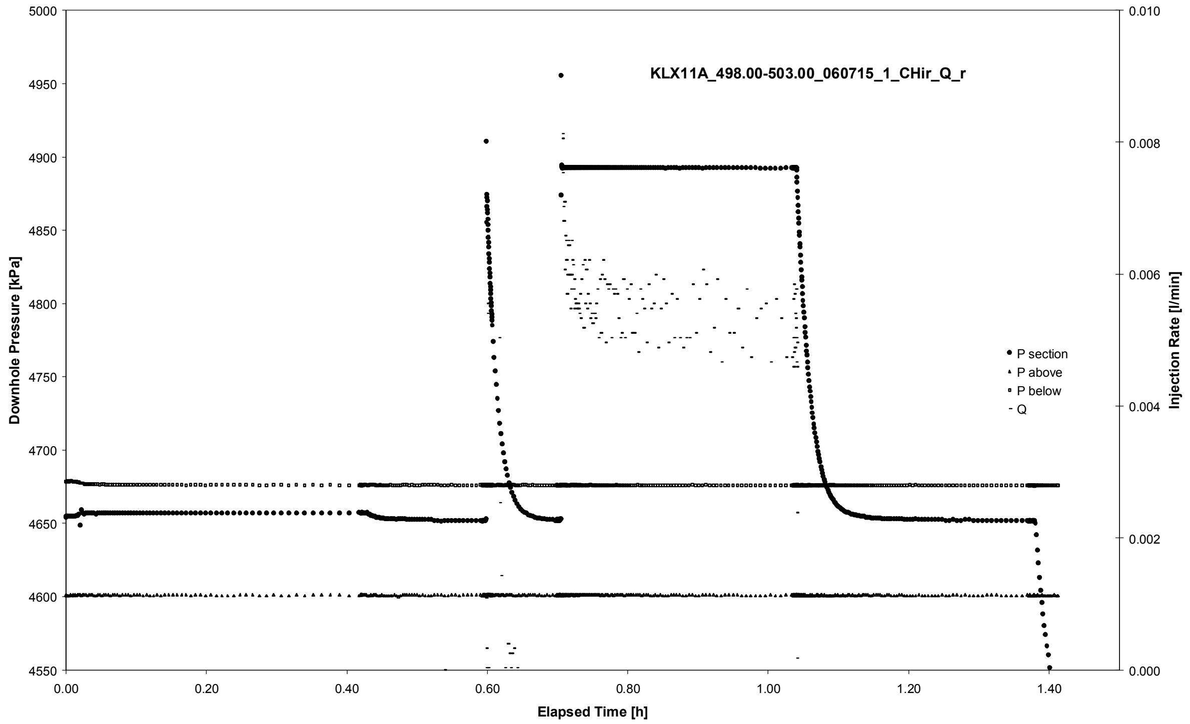


Pulse injection; deconvolution match

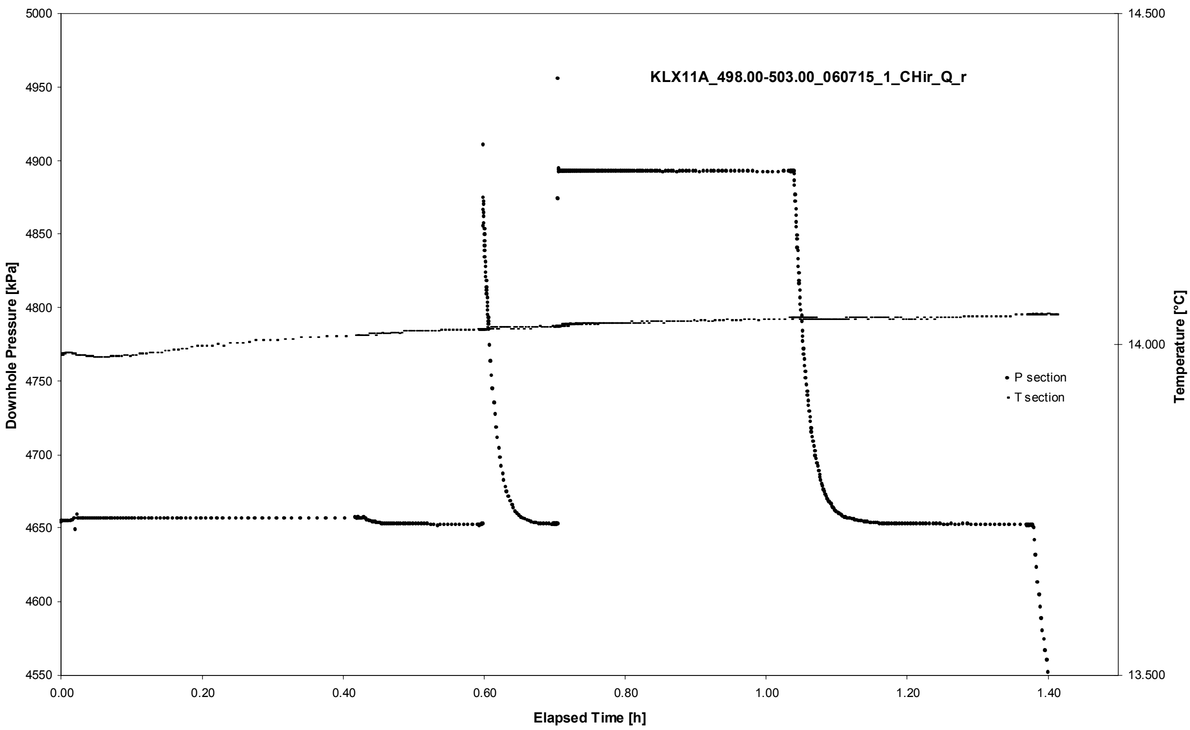
APPENDIX 2-73

Test 498.00 – 503.00 m

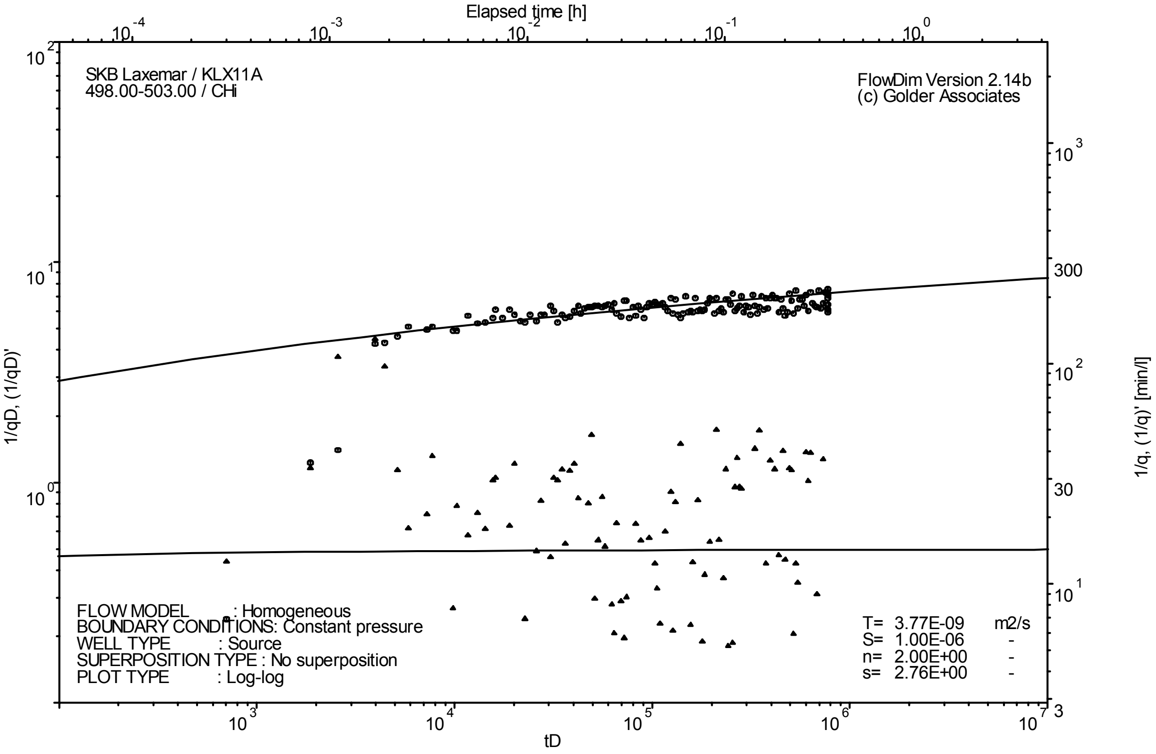
Analysis diagrams



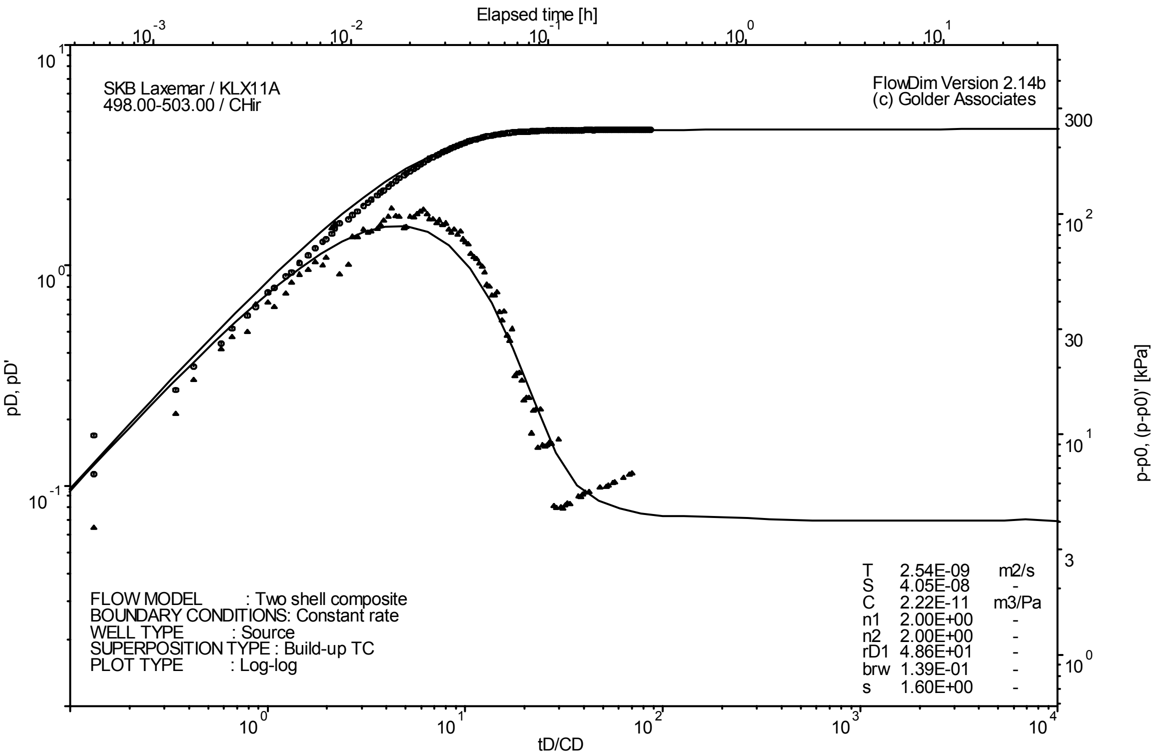
Pressure and flow rate vs. time; cartesian plot



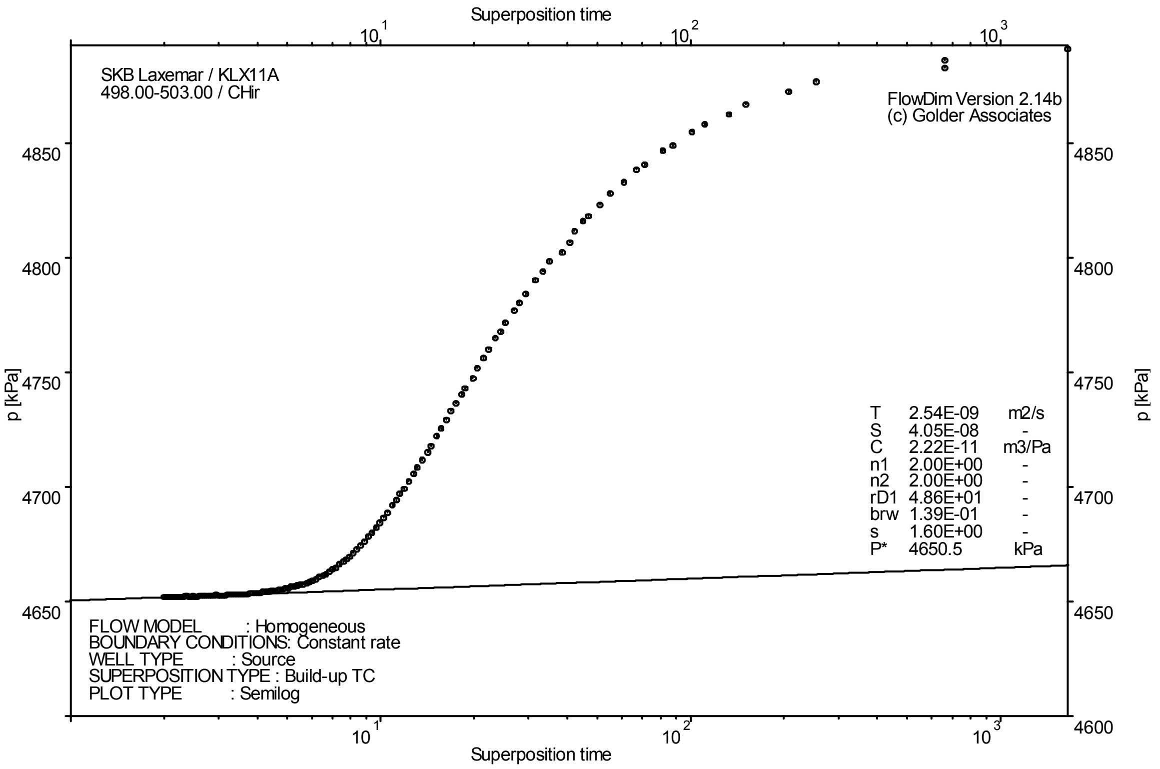
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

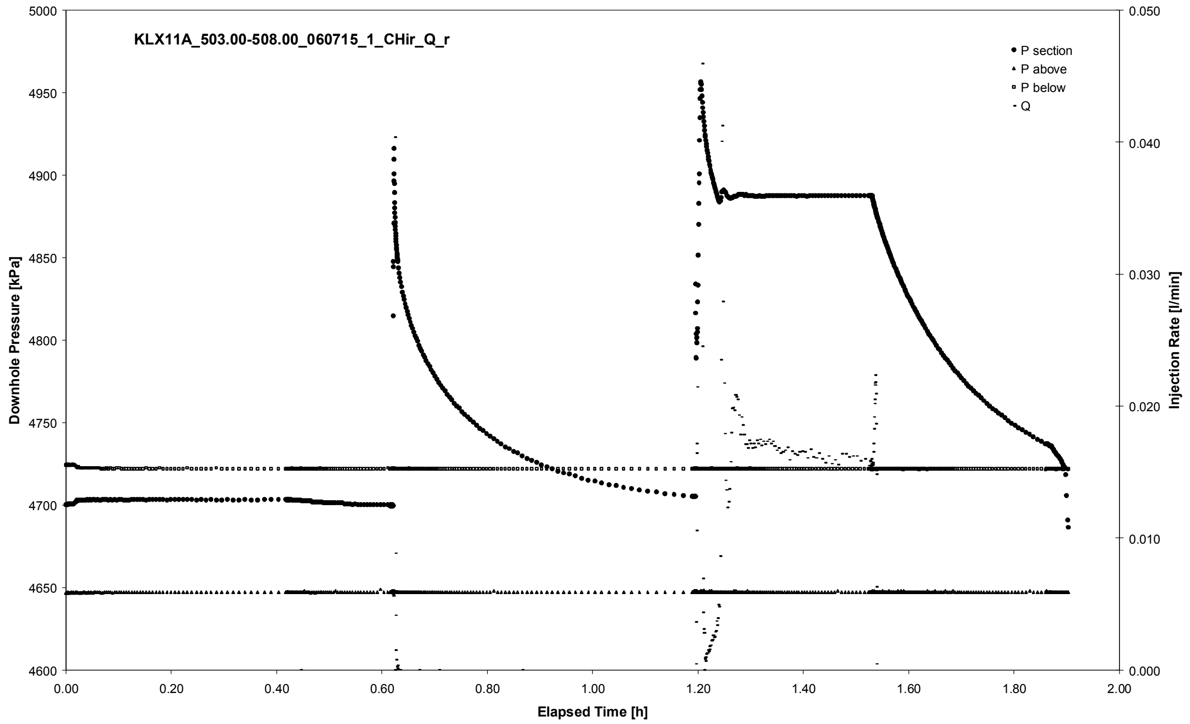


CHIR phase; HORNER match

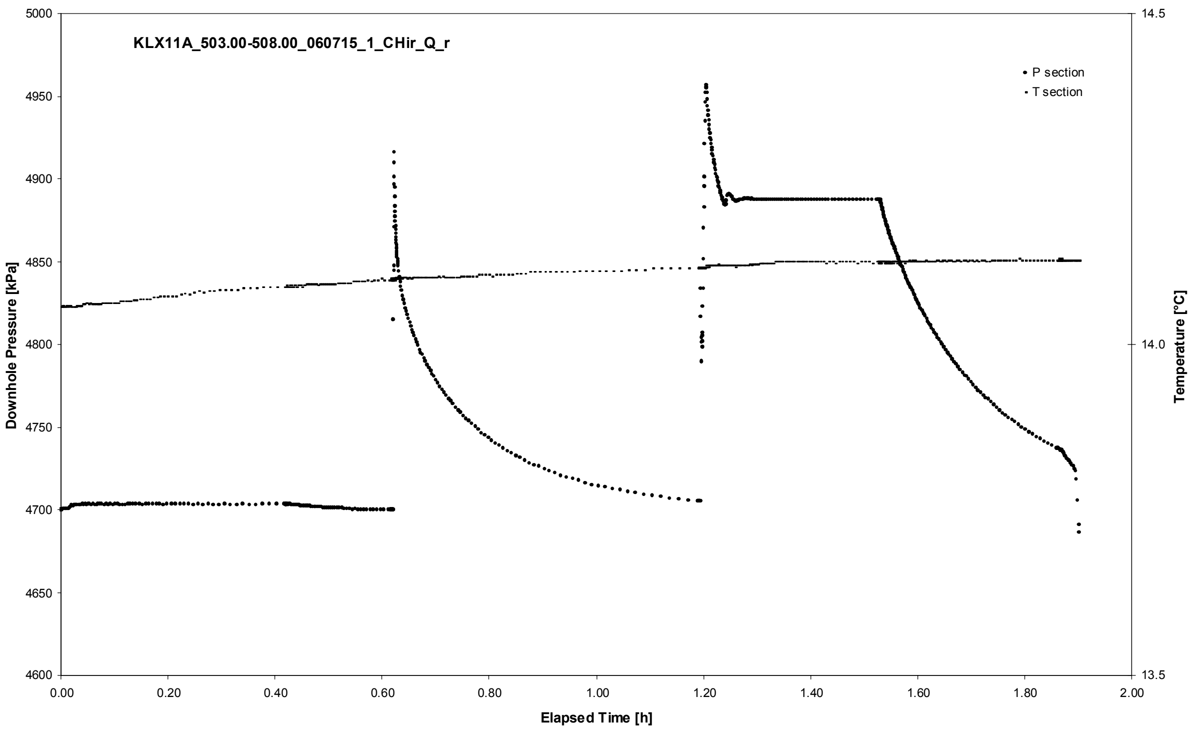
APPENDIX 2-74

Test 503.00 – 508.00 m

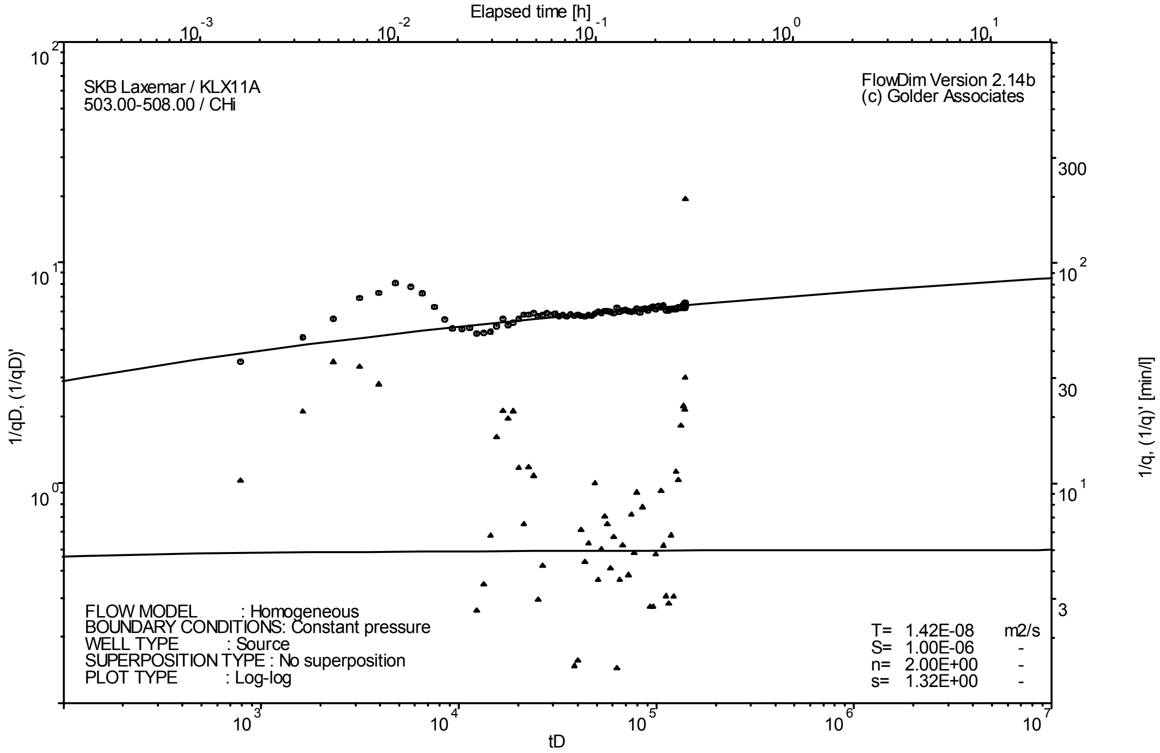
Analysis diagrams



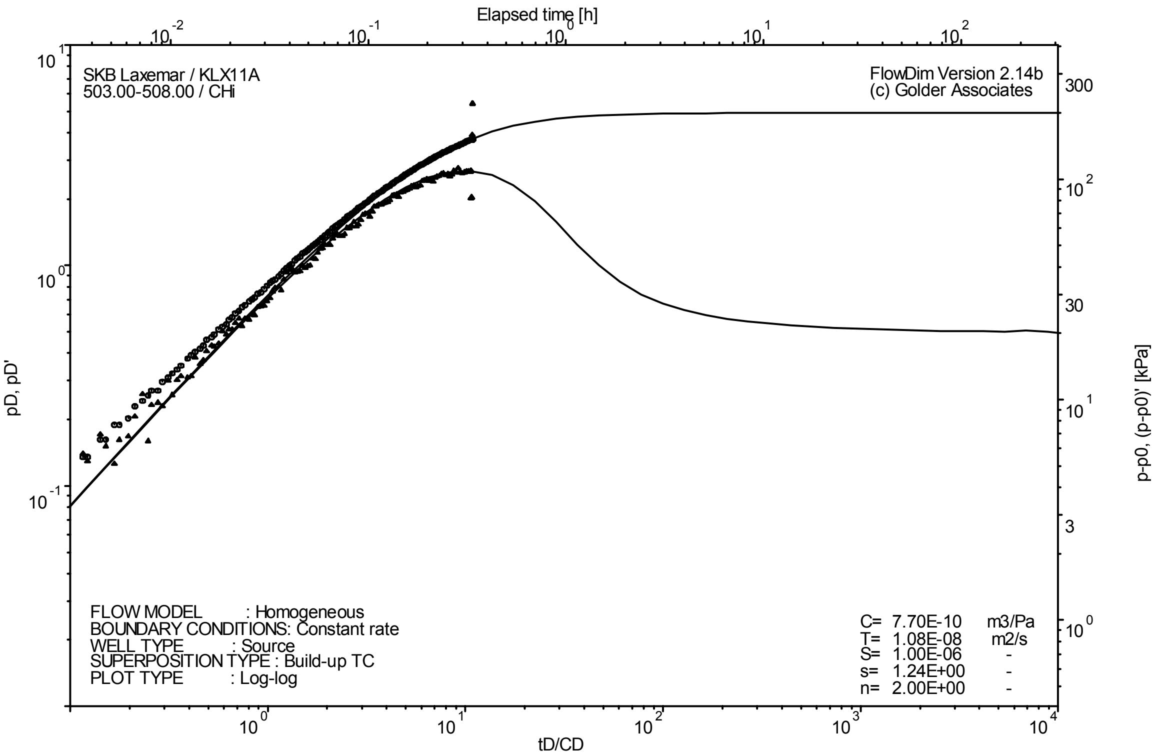
Pressure and flow rate vs. time; cartesian plot



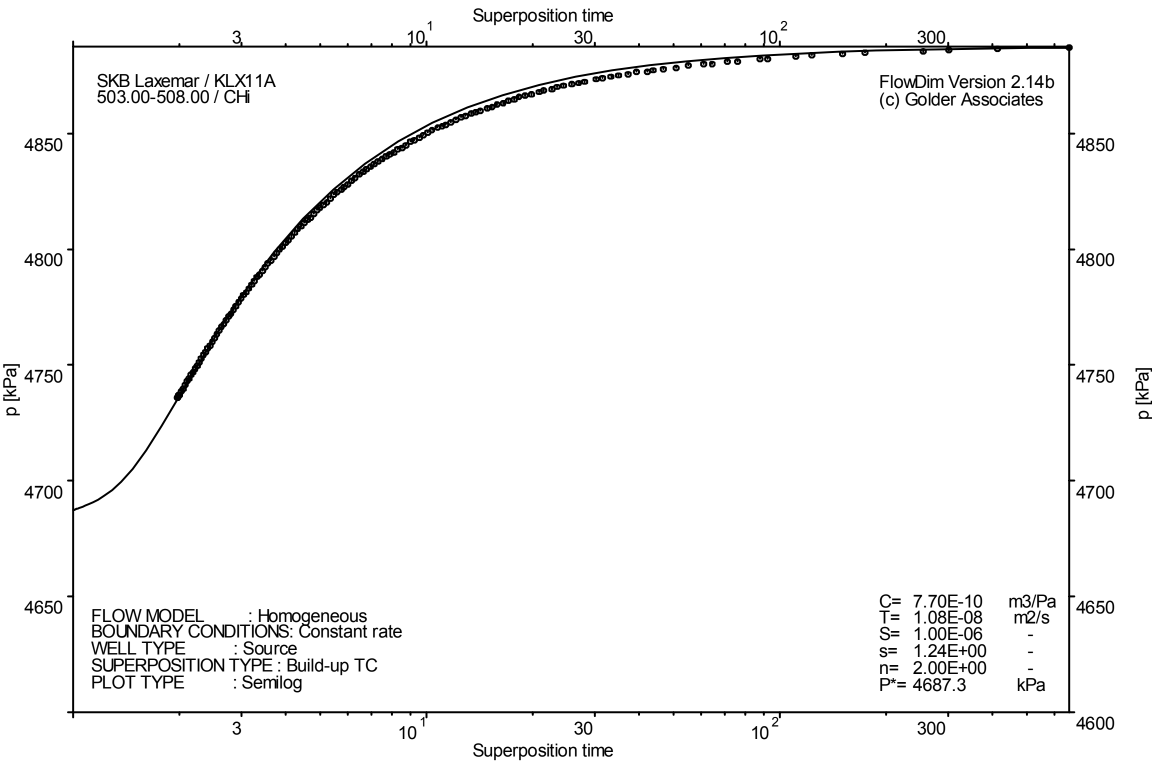
Interval pressure and temperature vs. time; cartesian plot



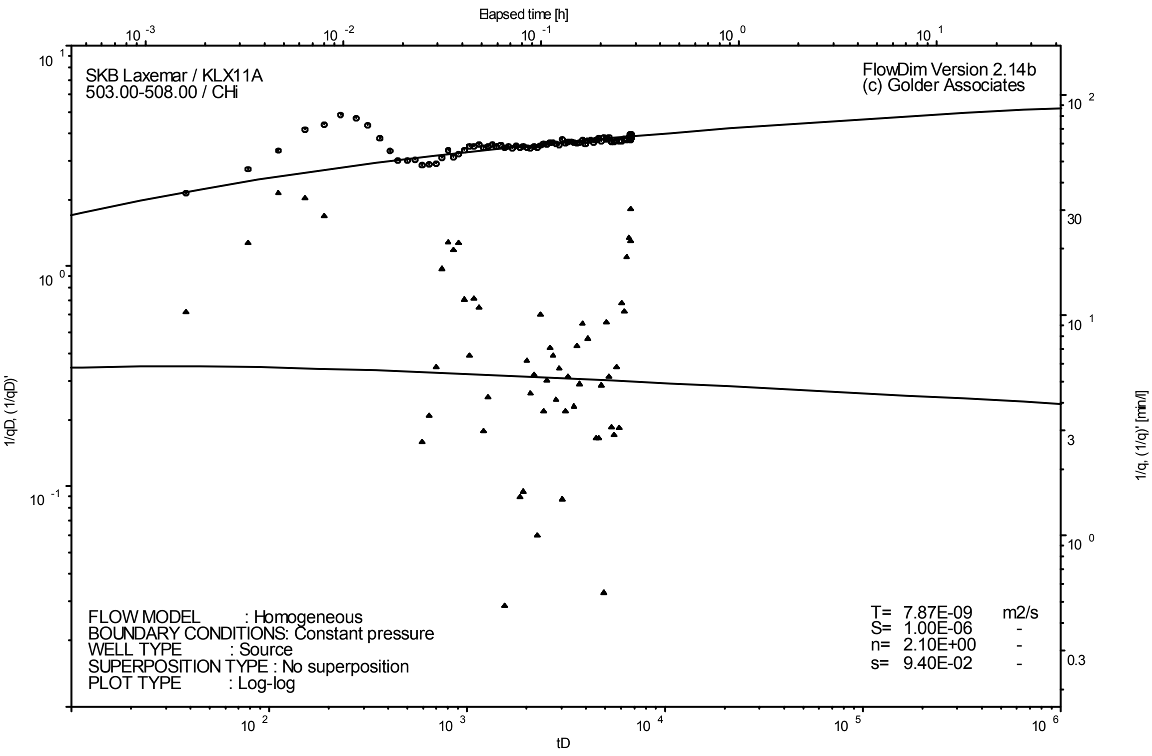
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

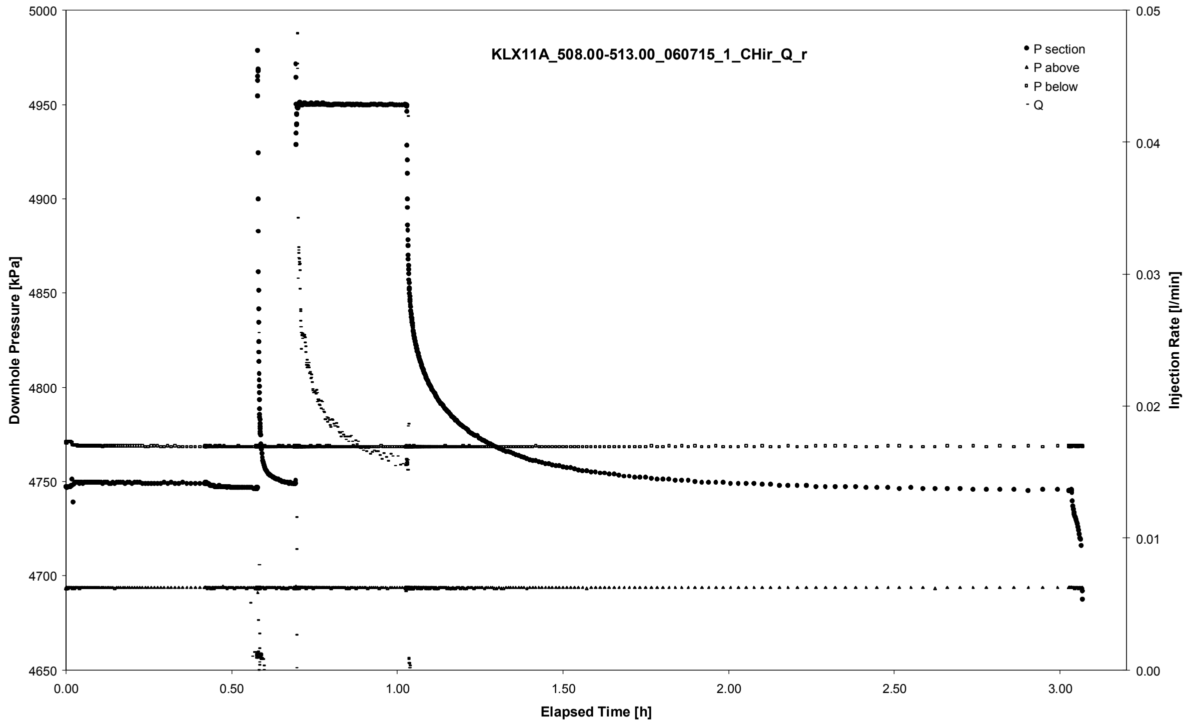


CHI phase; log-log match (n=2.1)

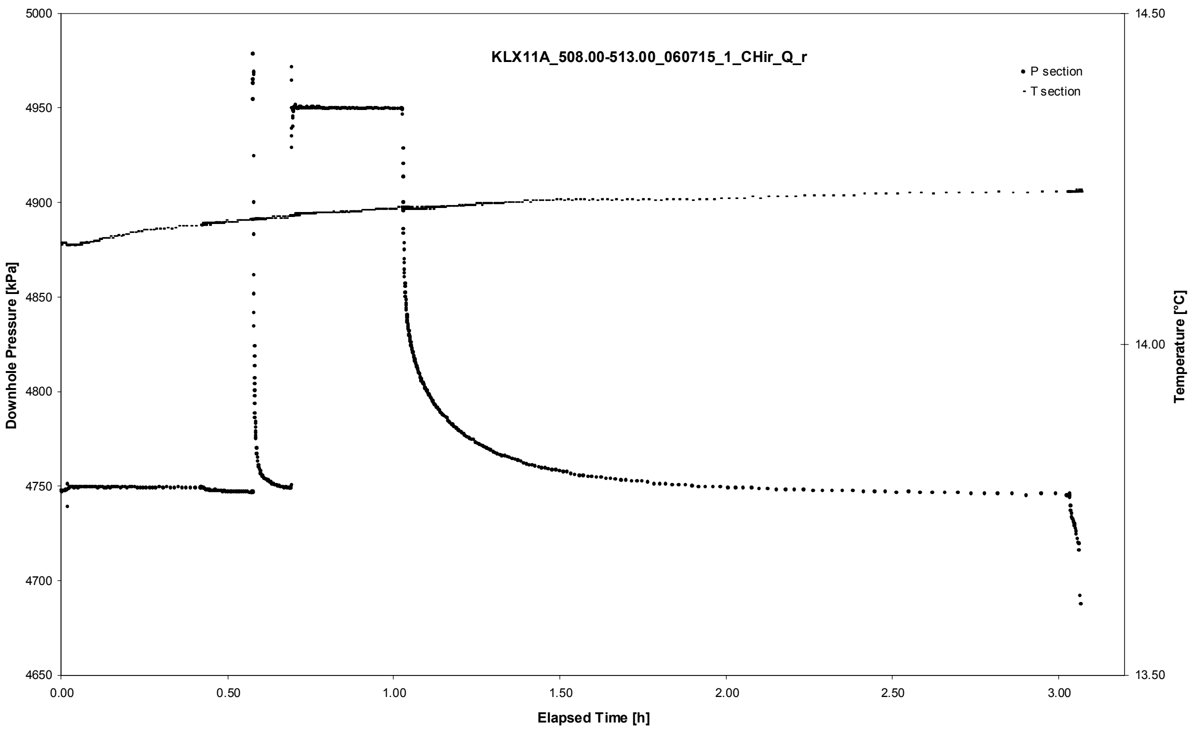
APPENDIX 2-75

Test 508.00 – 513.00 m

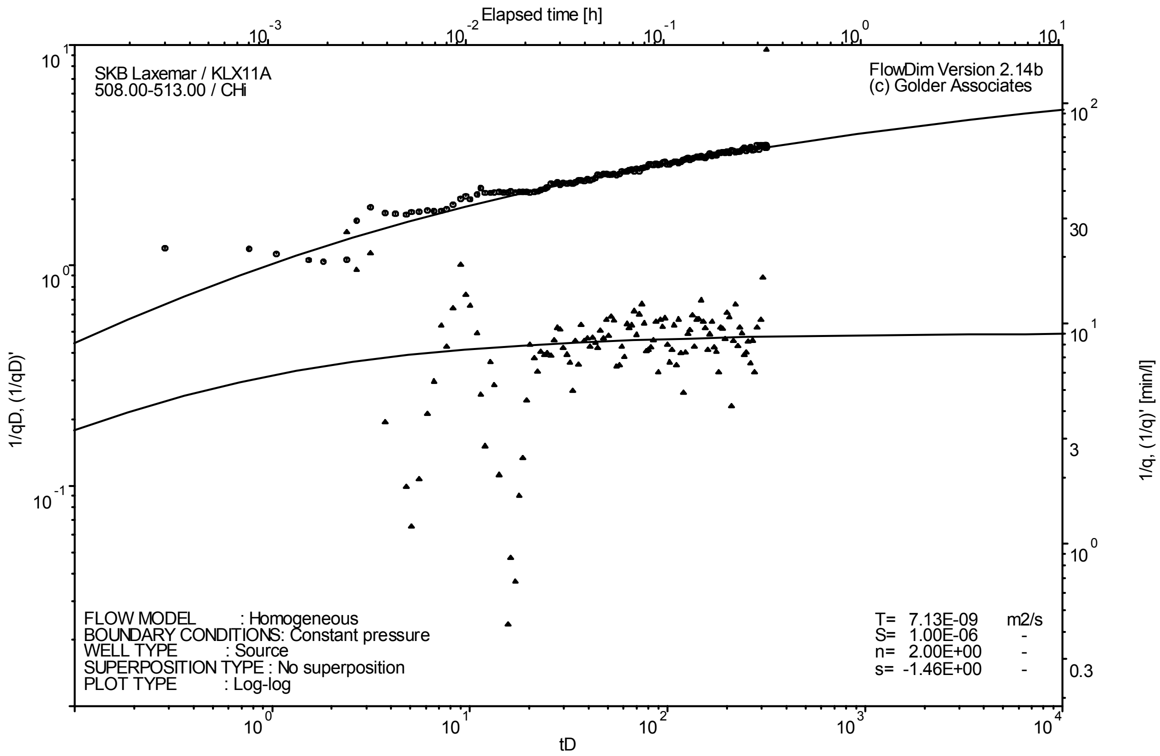
Analysis diagrams



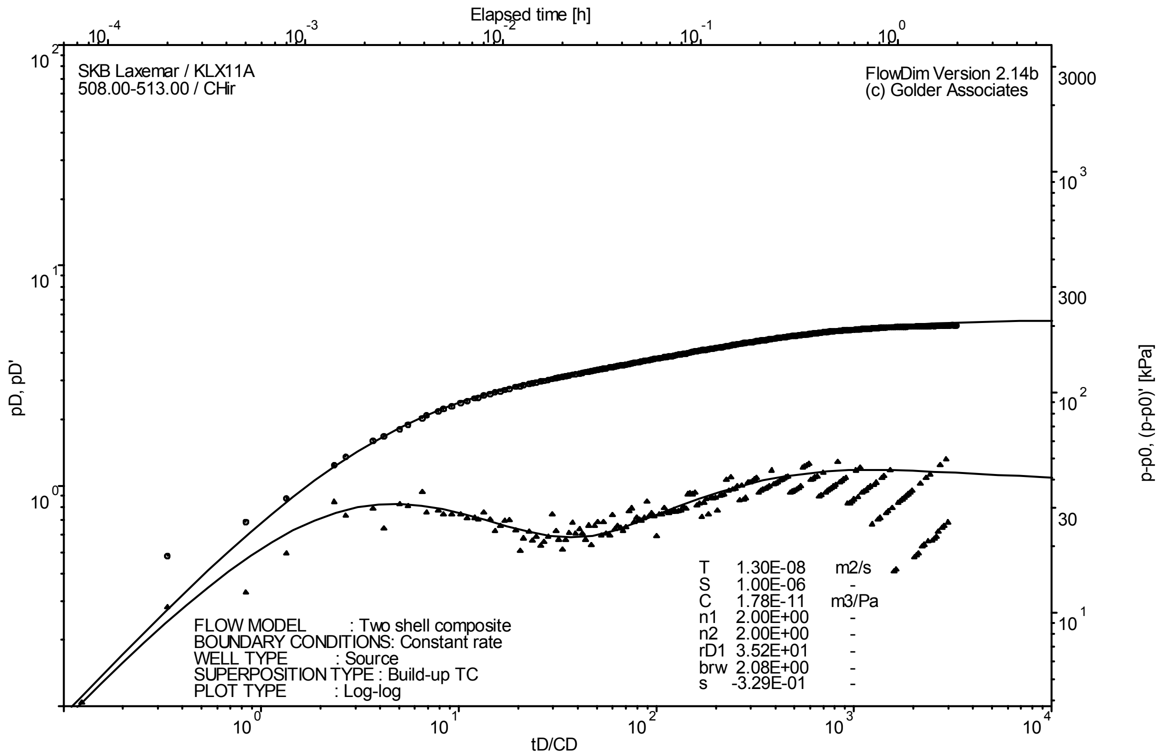
Pressure and flow rate vs. time; cartesian plot



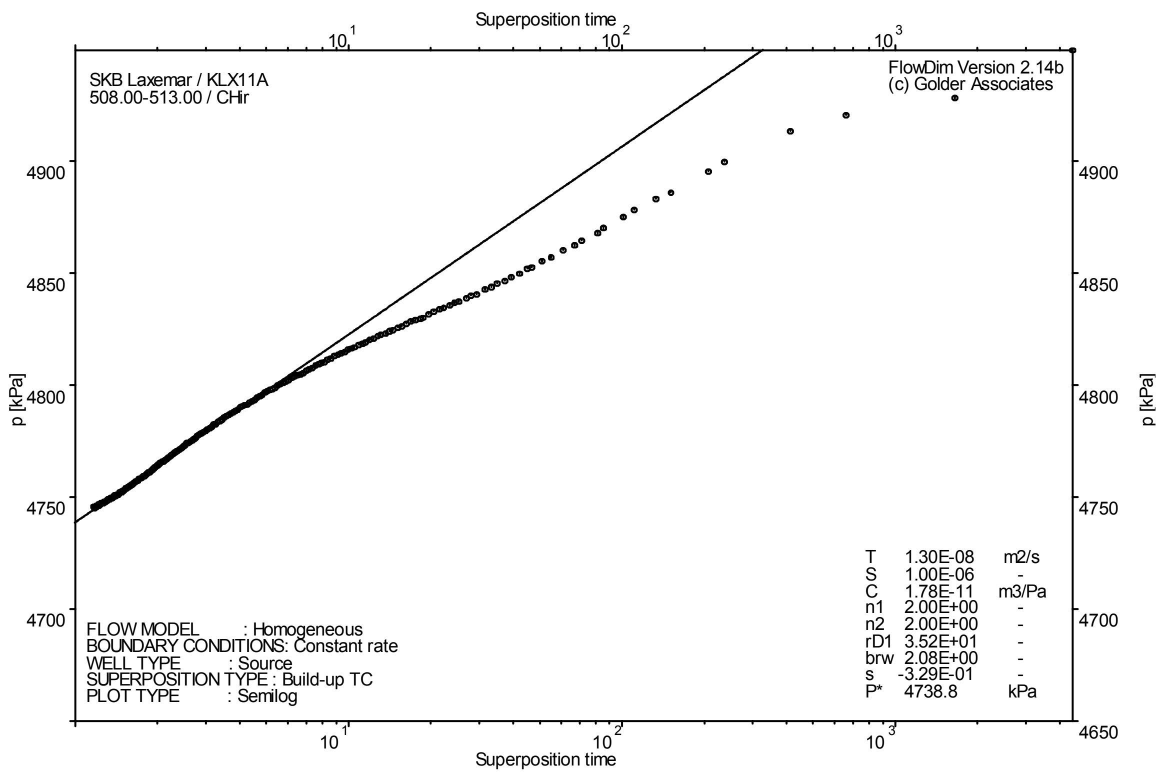
Interval pressure and temperature vs. time; cartesian plot



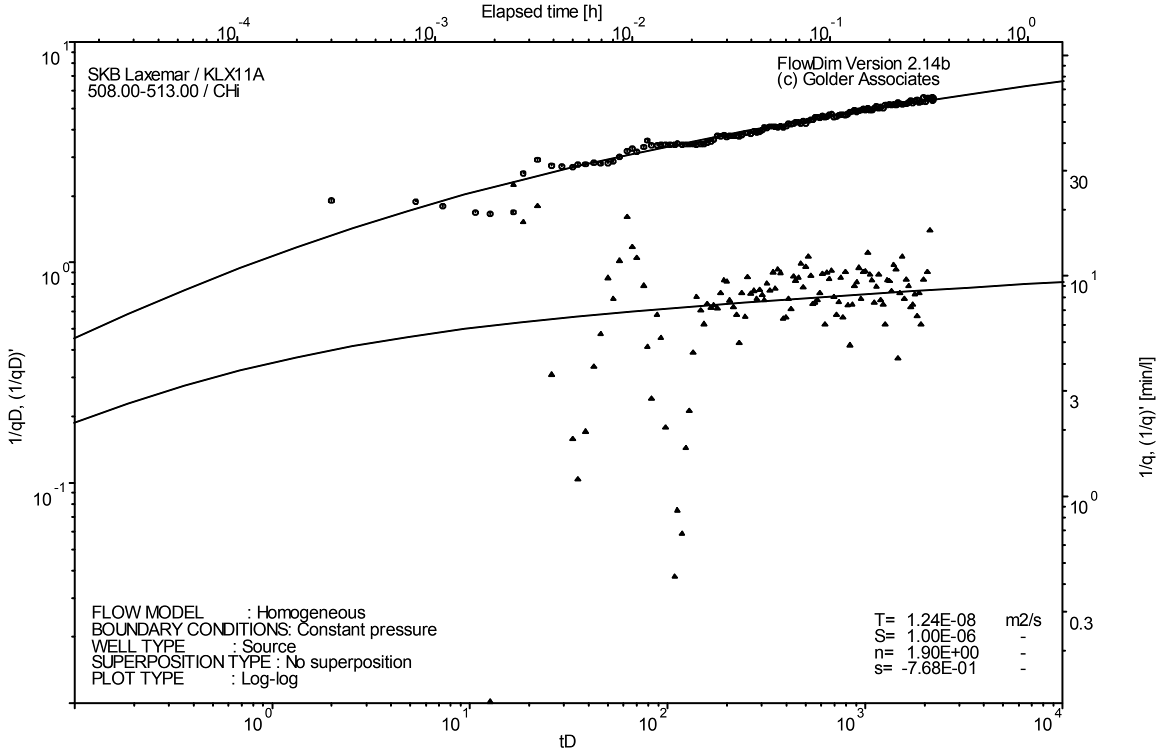
CHI phase; log-log match



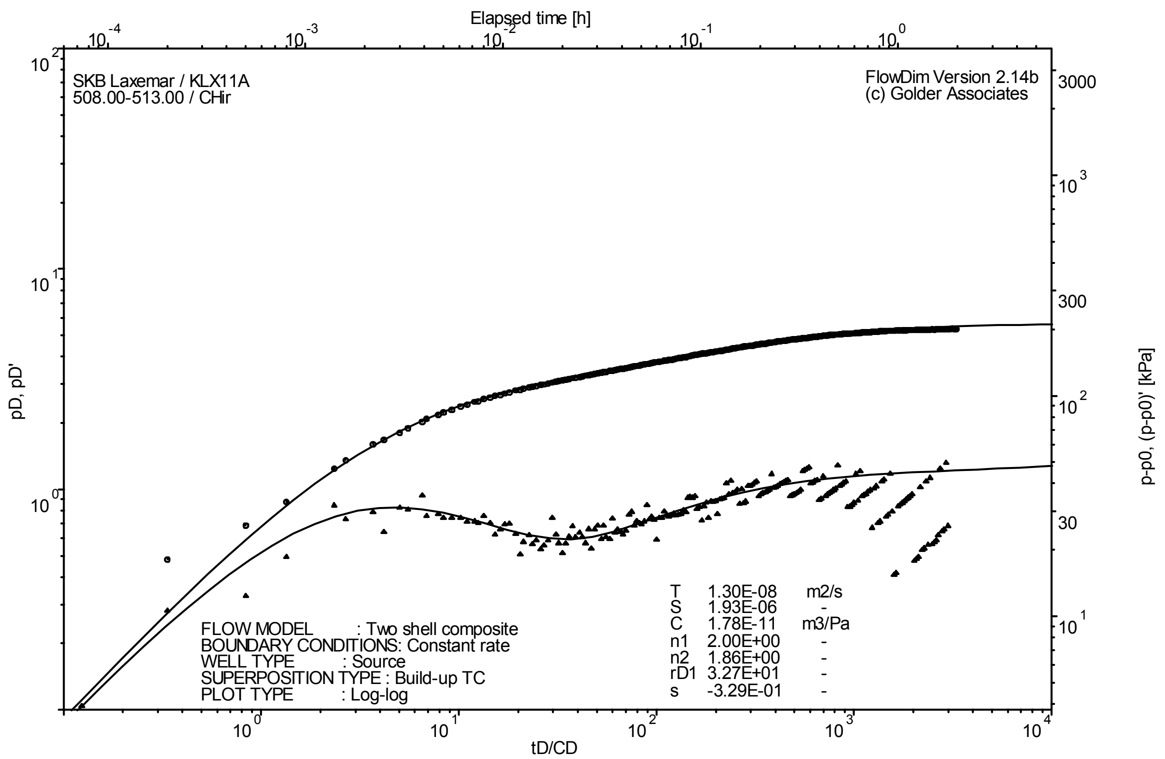
CHIR phase; log-log match



CHIR phase; HORNER match



CHI phase; log-log match (n=1.9)

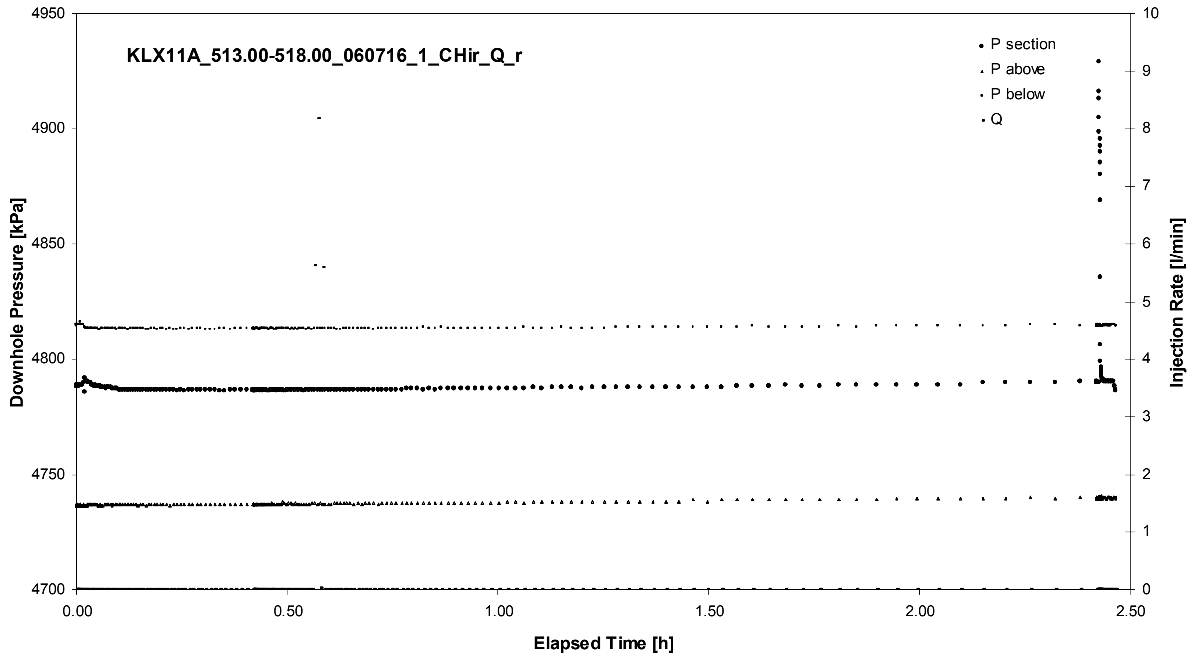


CHIR phase; log-log match (n1=2, n2=1.86)

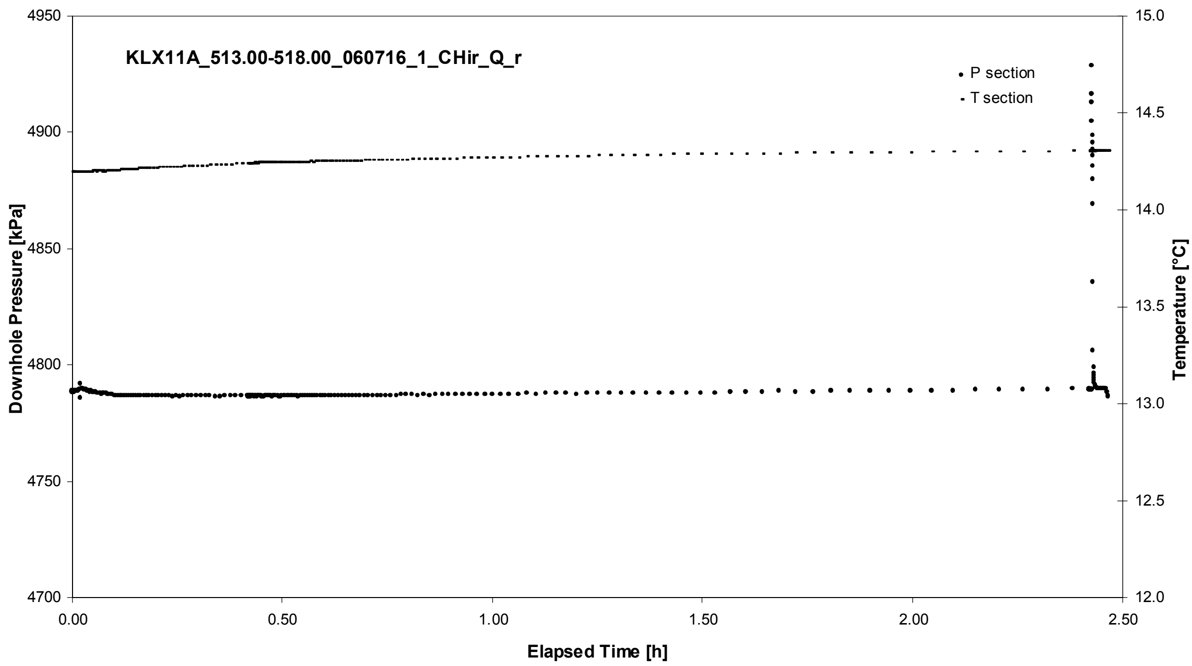
APPENDIX 2-76

Test 513.00 – 518.00 m

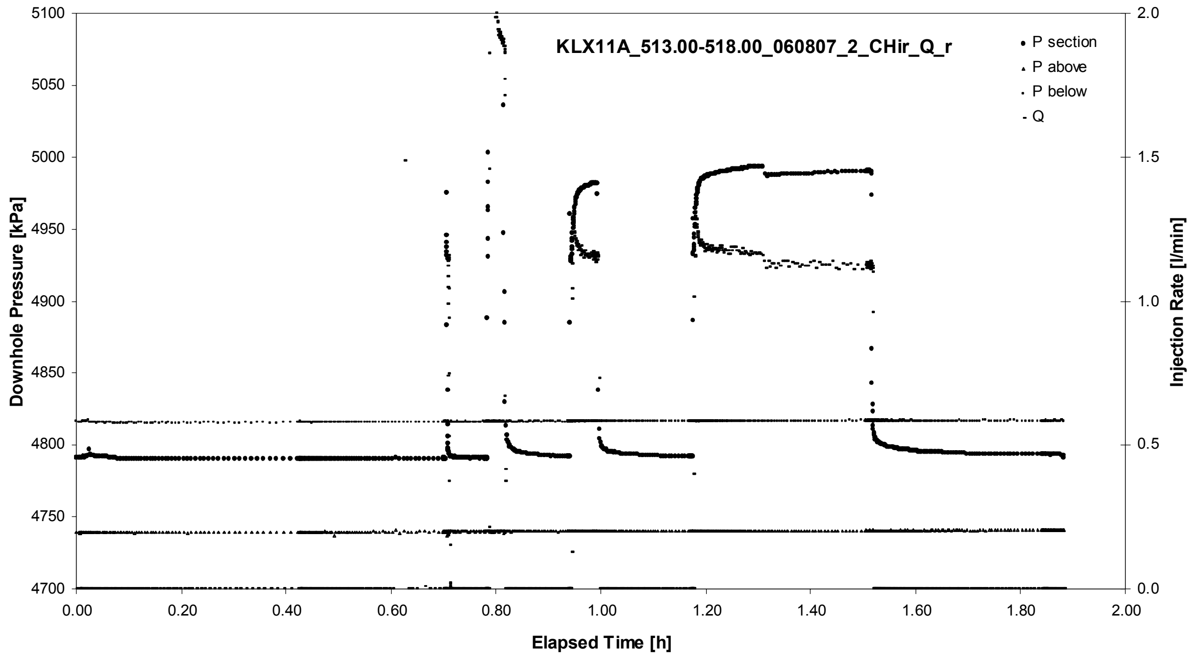
Analysis diagrams



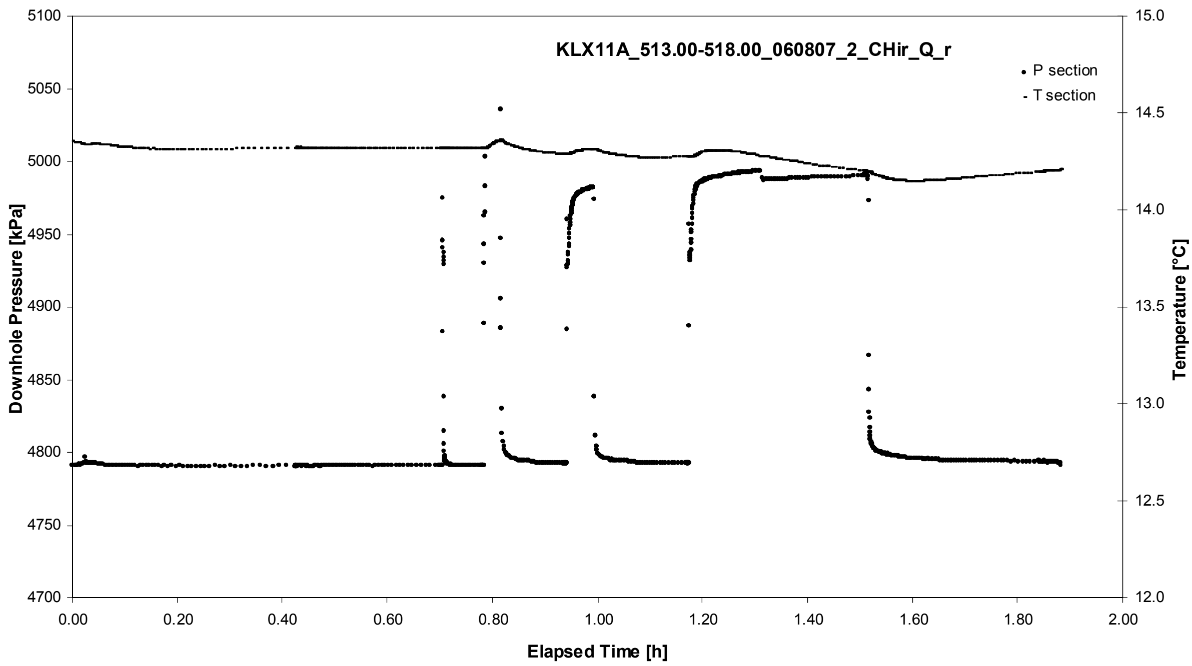
Pressure and flow rate vs. time; cartesian plot (test repeated)



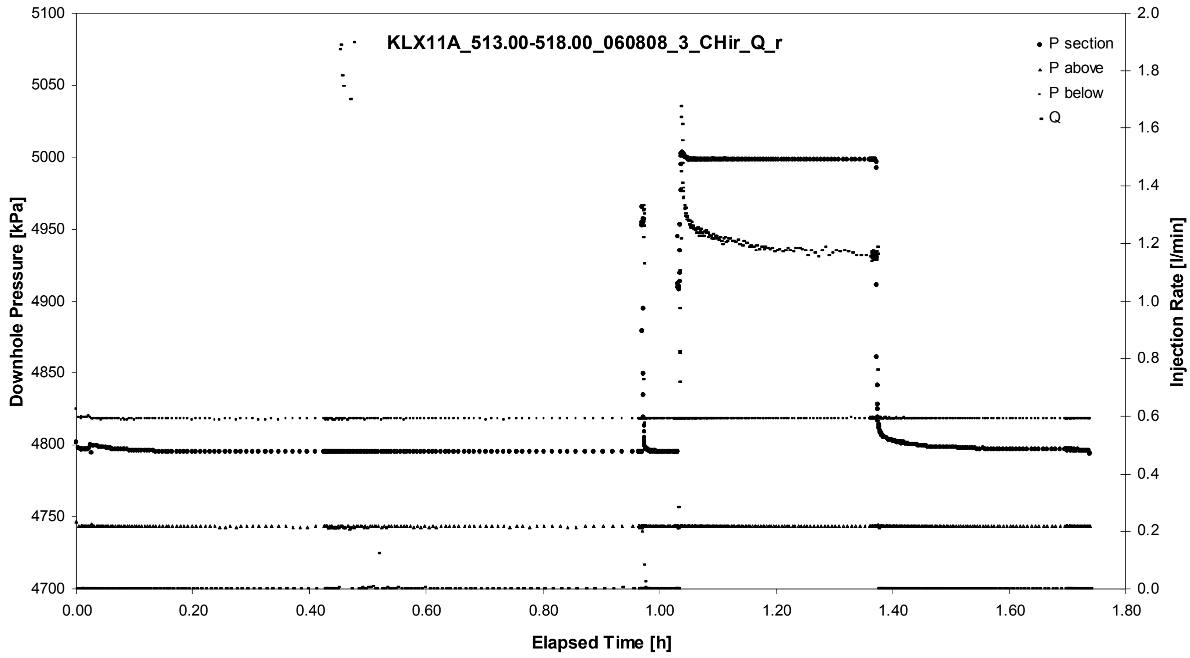
Interval pressure and temperature vs. time; cartesian plot (test repeated)



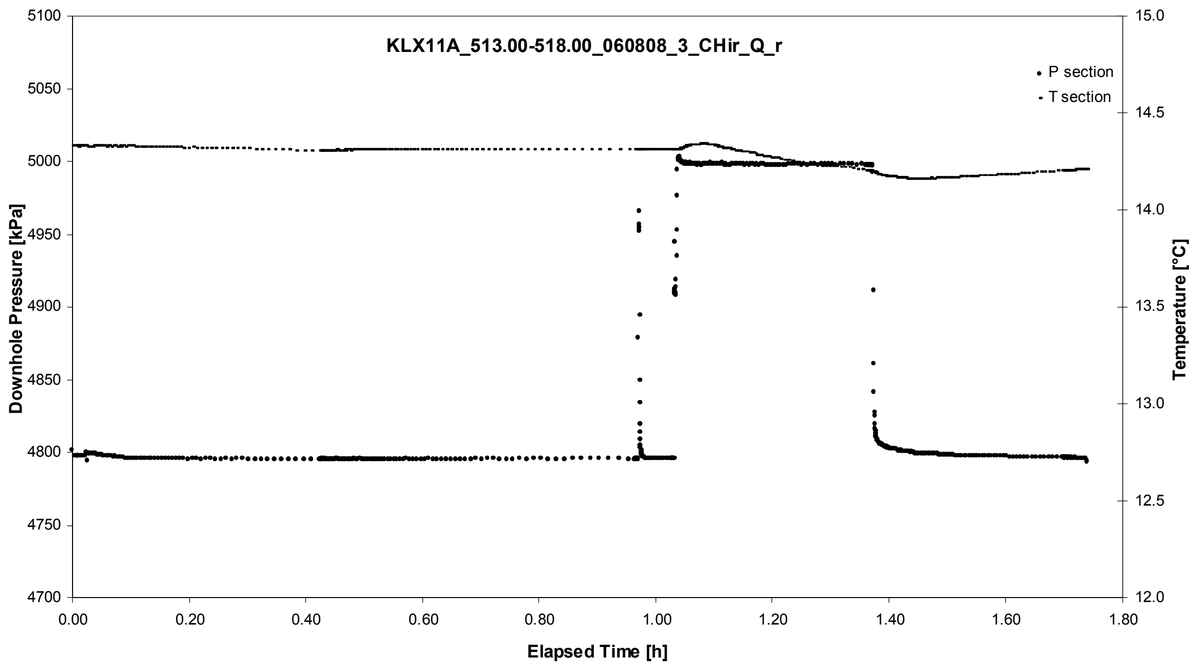
Pressure and flow rate vs. time; cartesian plot (test repeated)



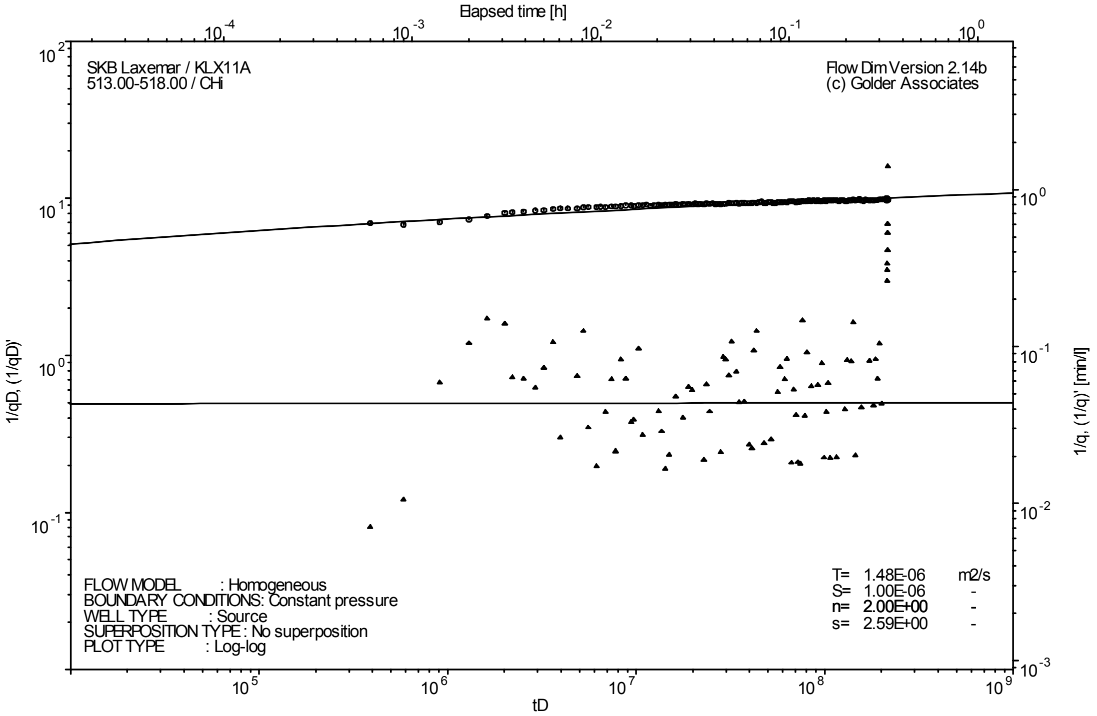
Interval pressure and temperature vs. time; cartesian plot (test repeated)



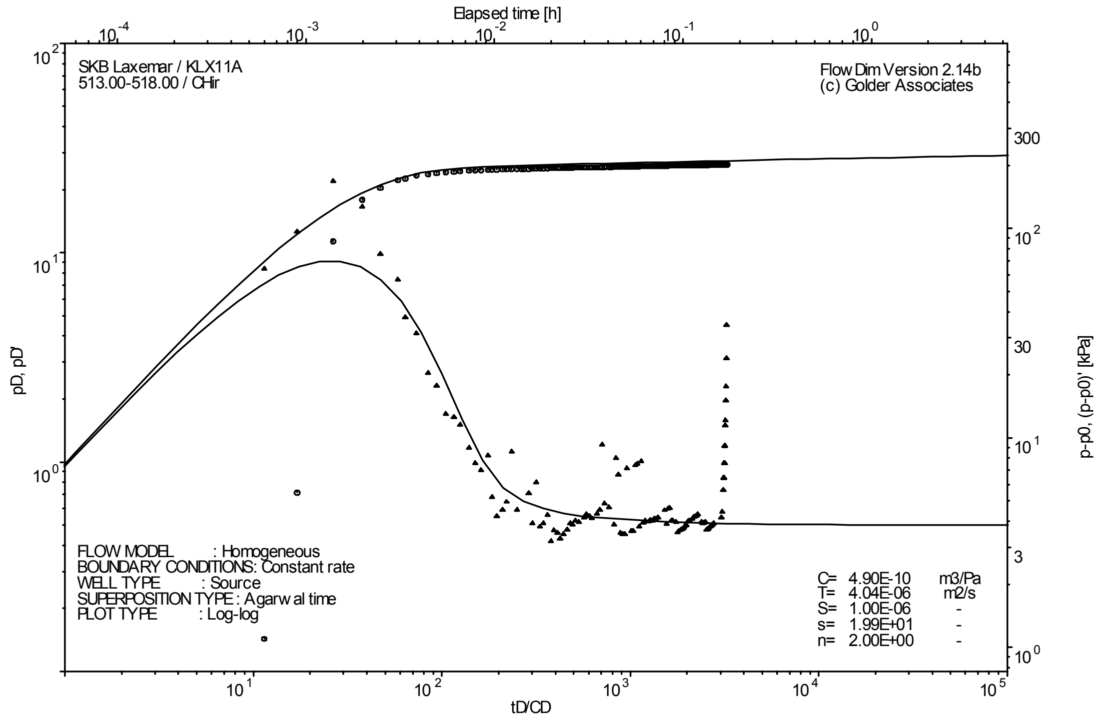
Pressure and flow rate vs. time; cartesian plot (analysed)



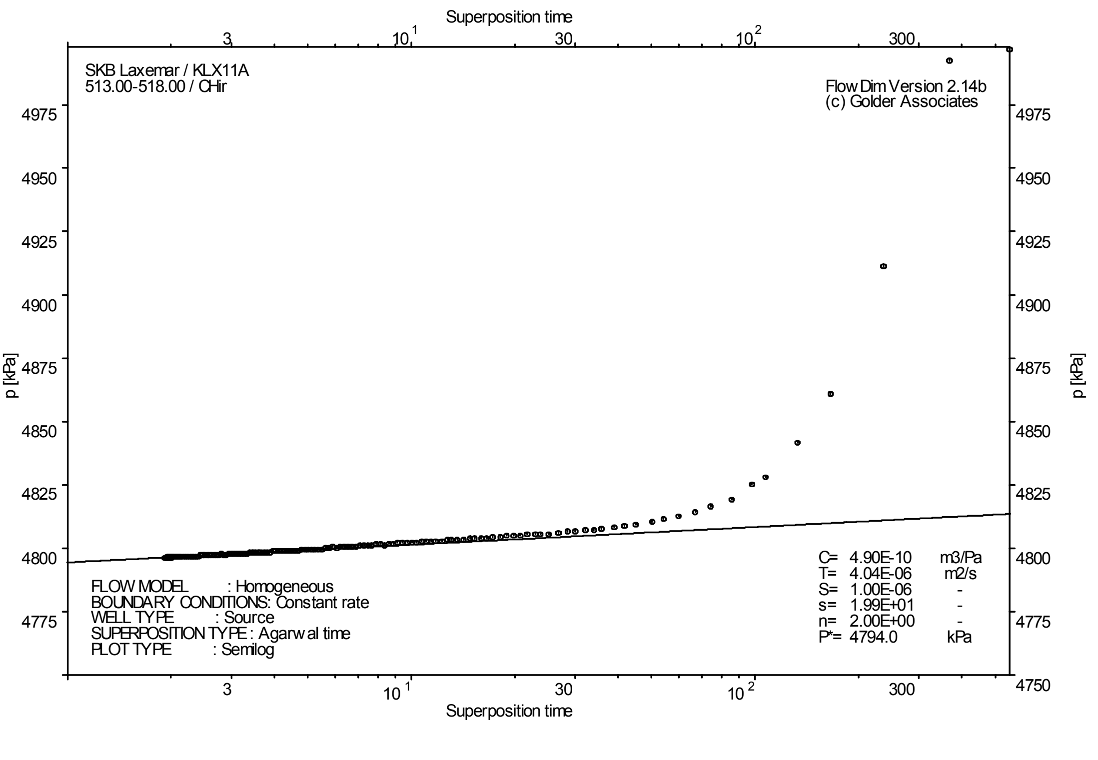
Interval pressure and temperature vs. time; cartesian plot (analysed)



CHI phase; log-log match



CHIR phase; log-log match

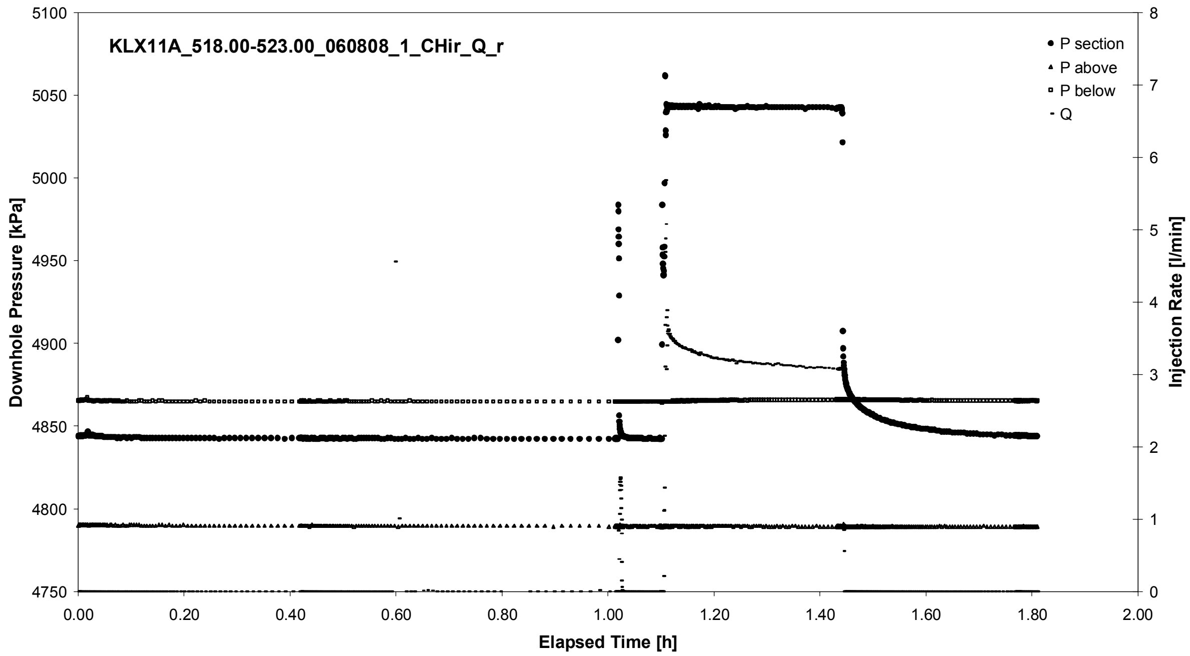


CHIR phase; HORNER match

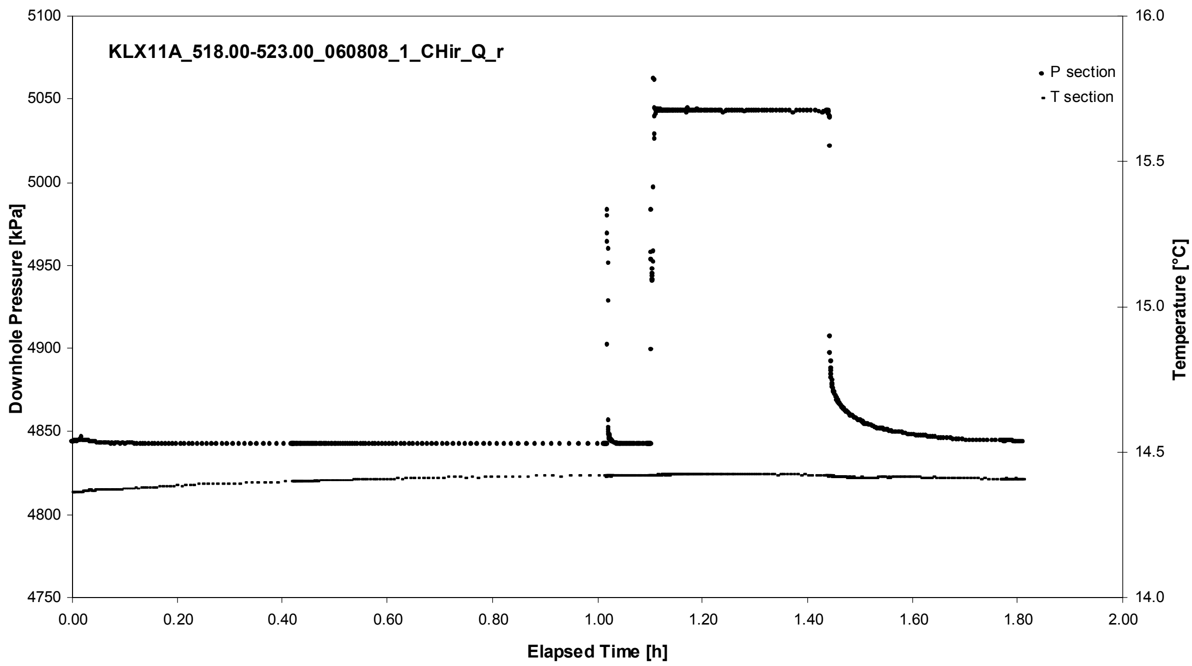
APPENDIX 2-77

Test 518.00 – 523.00 m

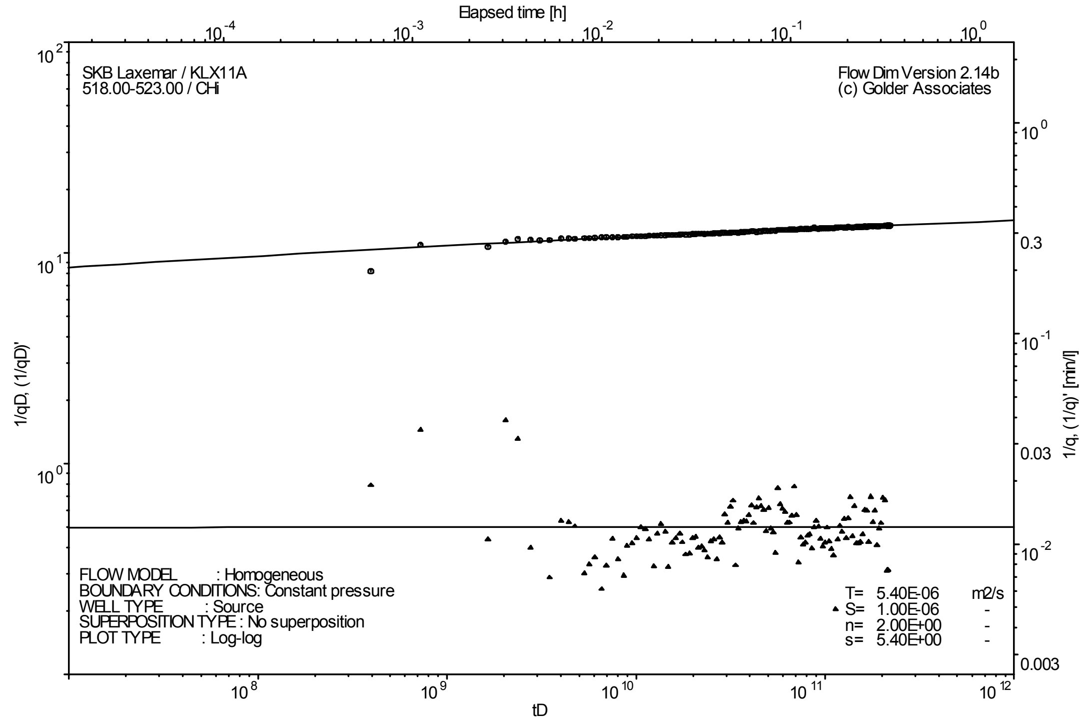
Analysis diagrams



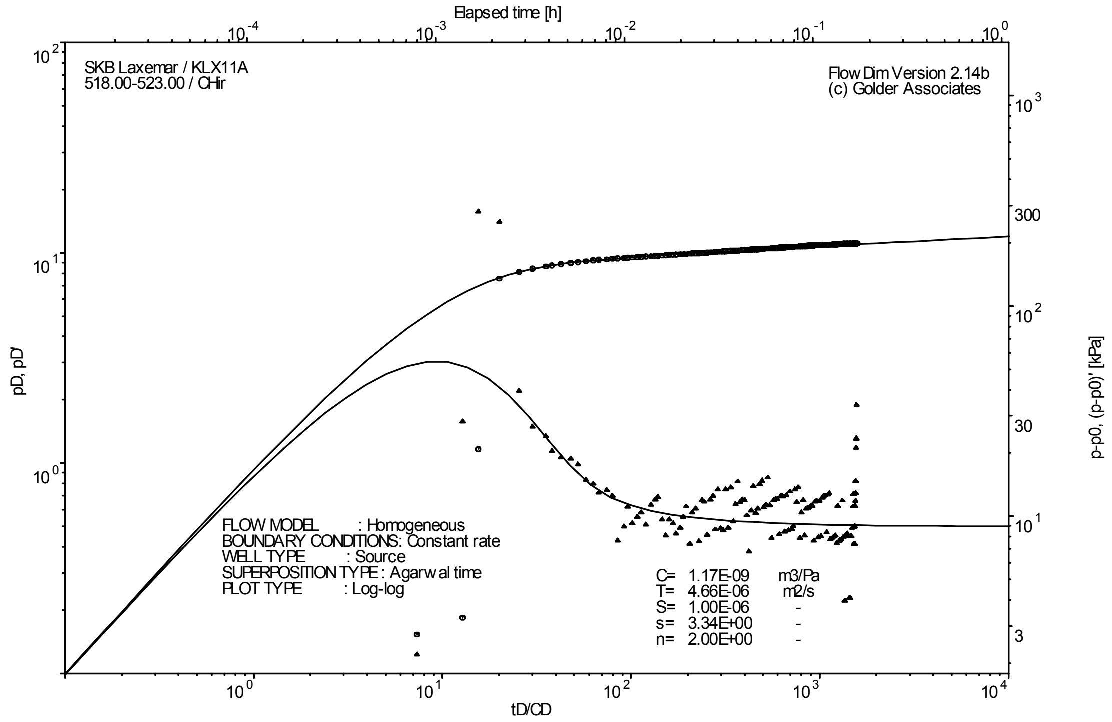
Pressure and flow rate vs. time; cartesian plot



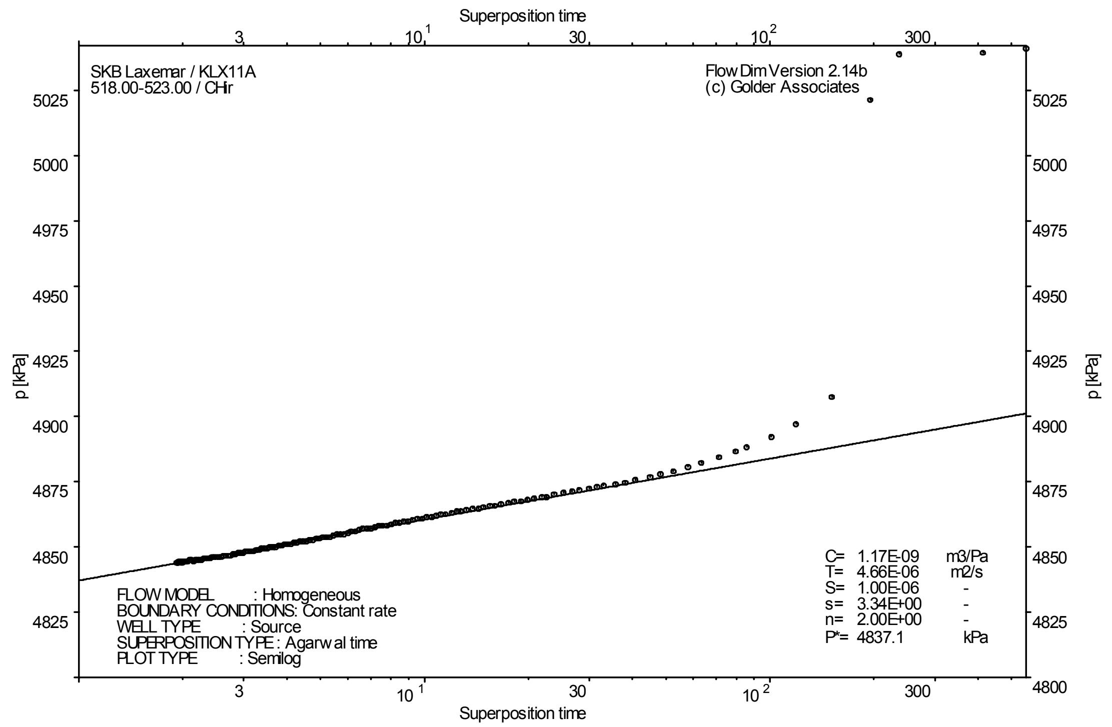
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

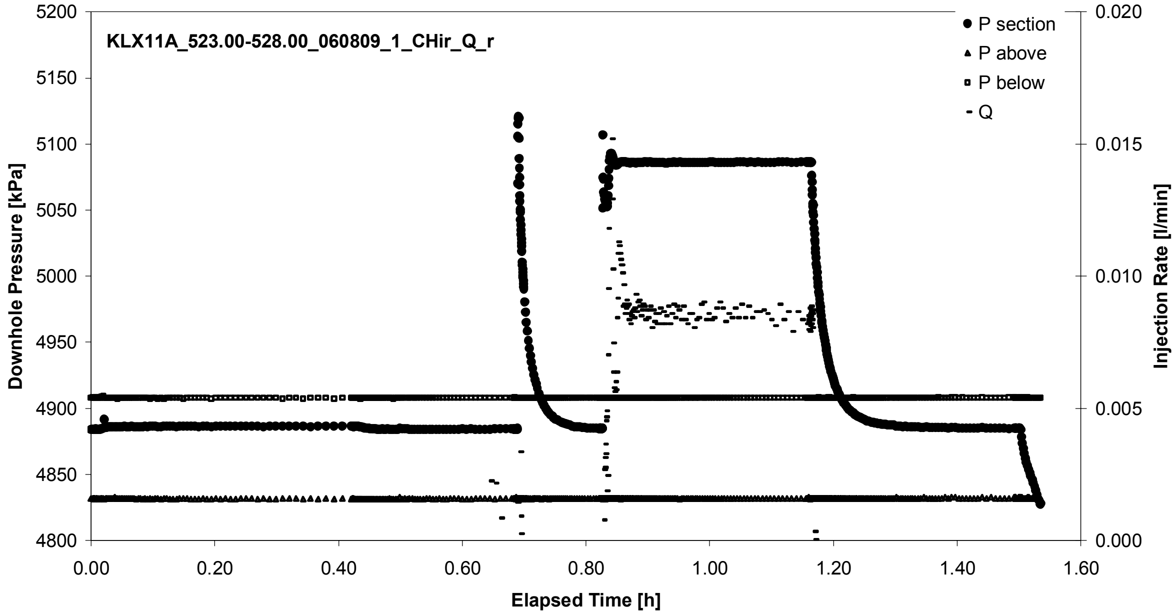


CHIR phase; HORNER match

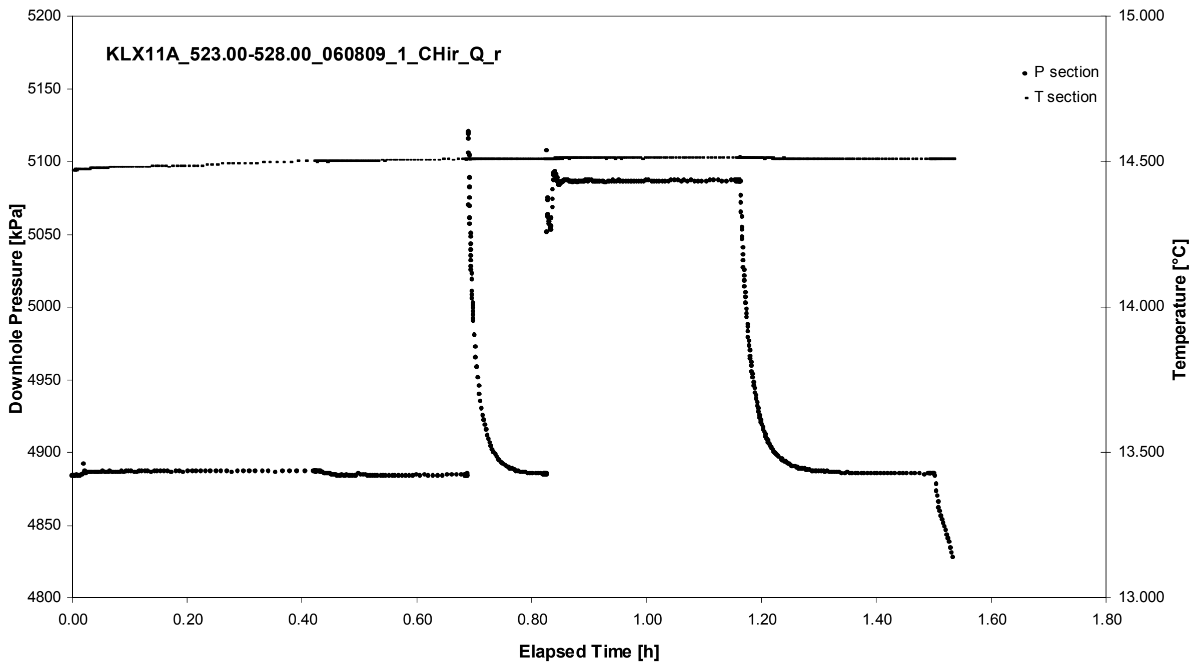
APPENDIX 2-78

Test 523.00 – 528.00 m

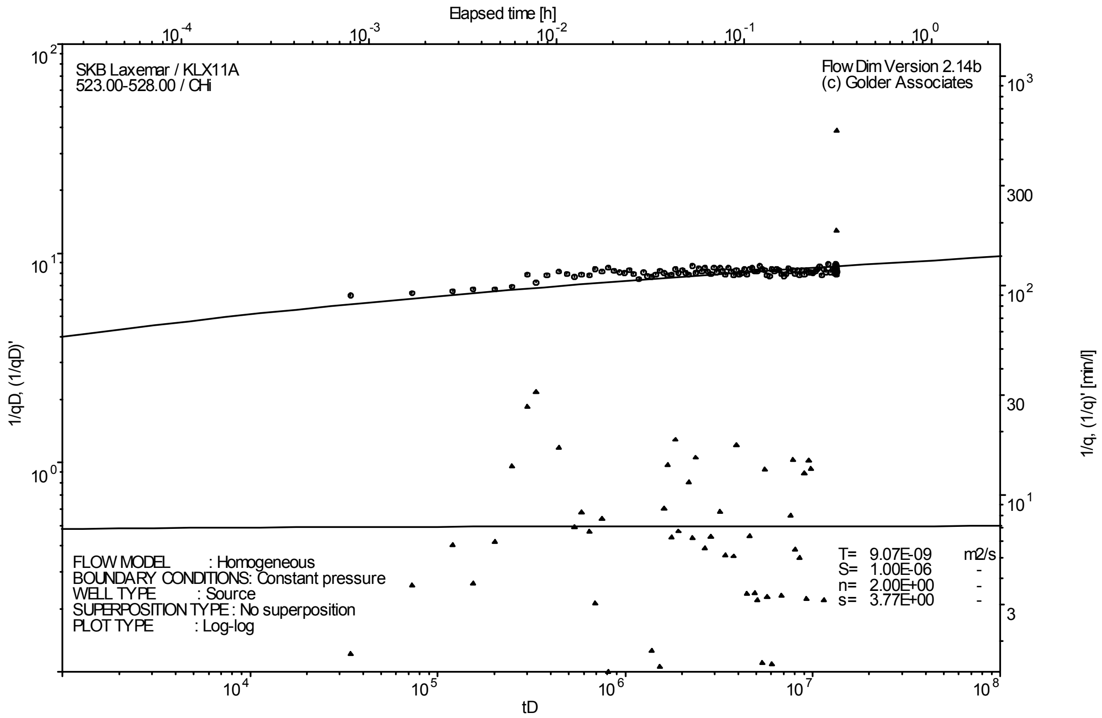
Analysis diagrams



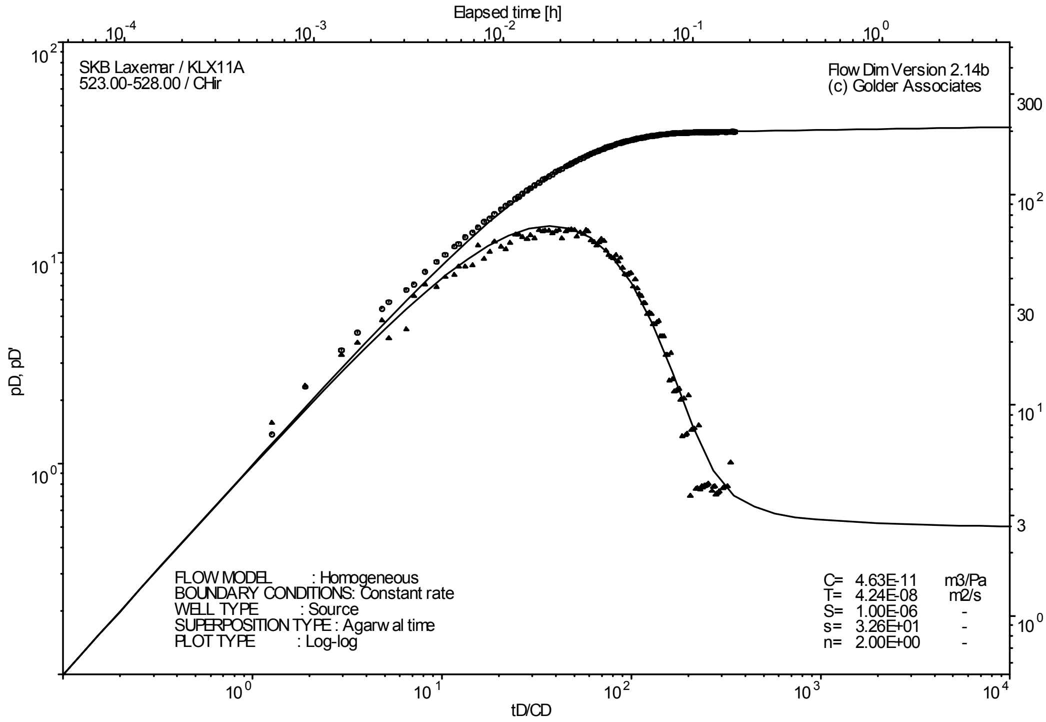
Pressure and flow rate vs. time; cartesian plot



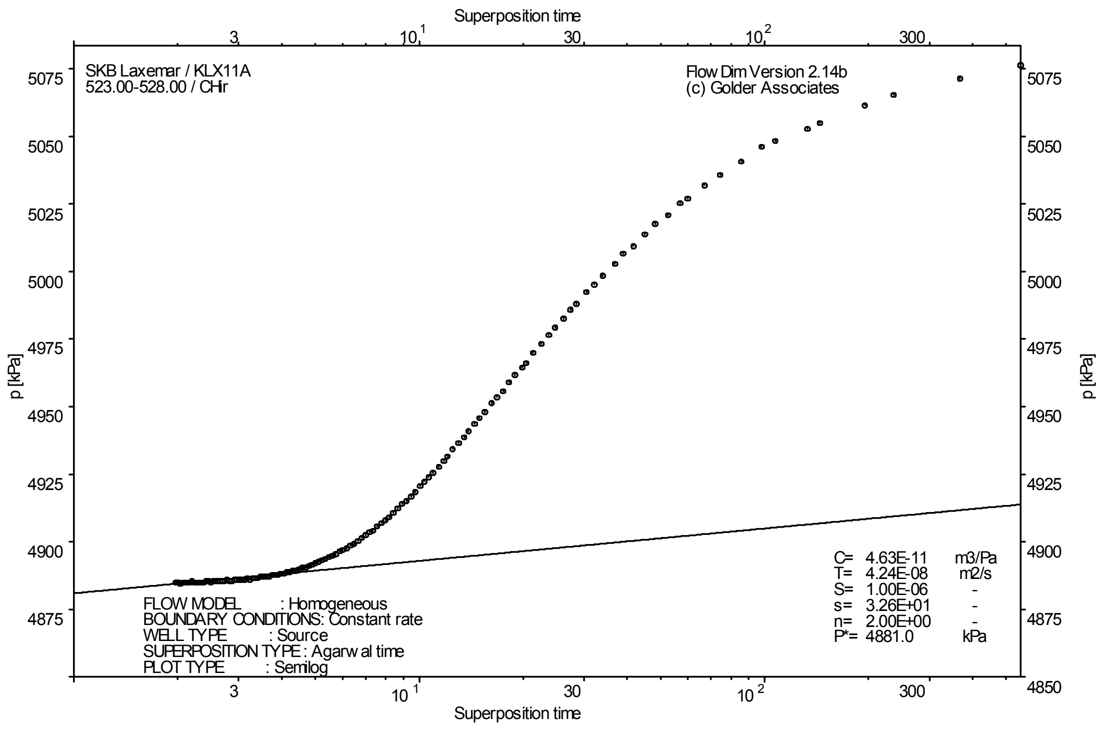
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

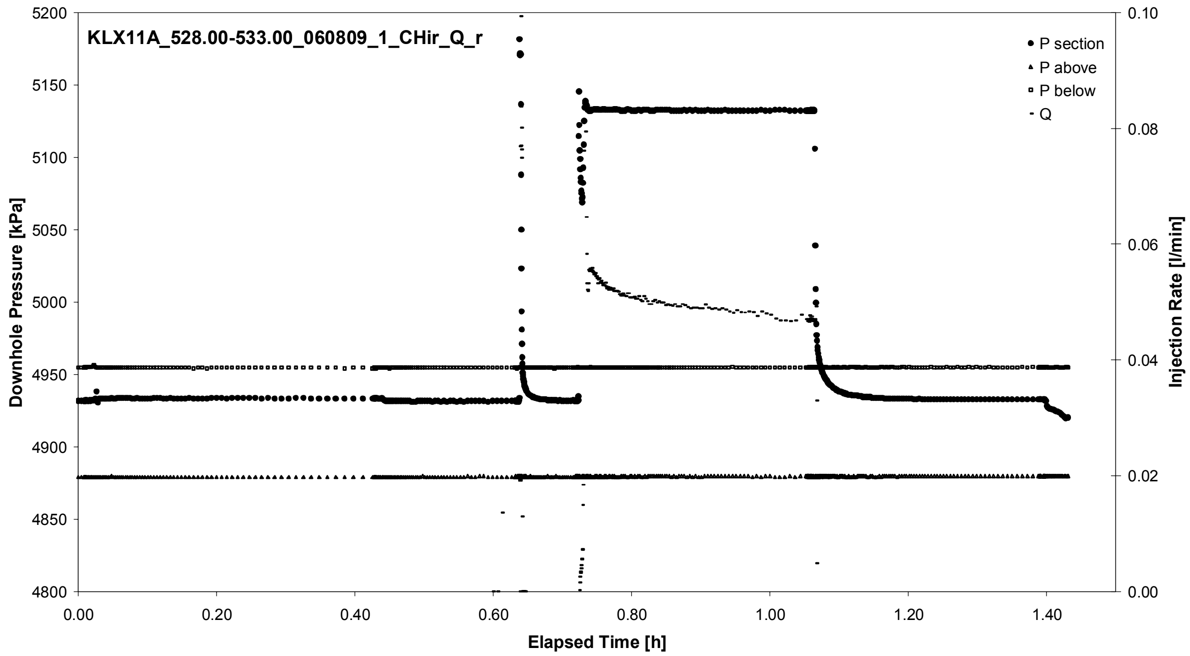


CHIR phase; HORNER match

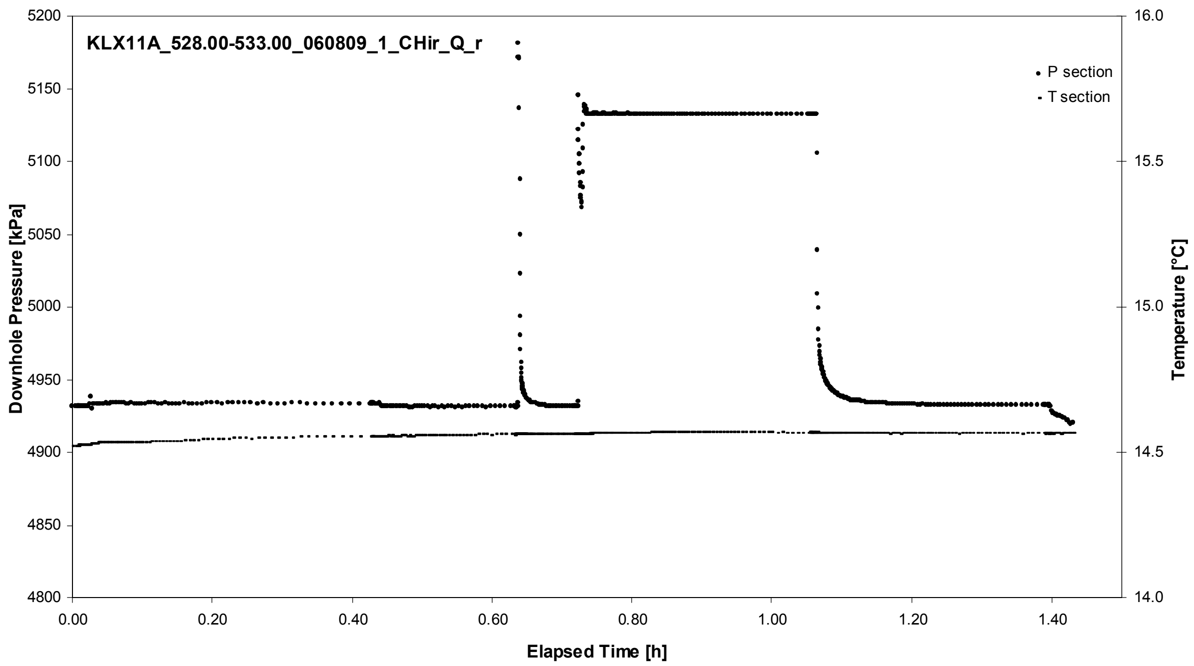
APPENDIX 2-79

Test 528.00 – 533.00 m

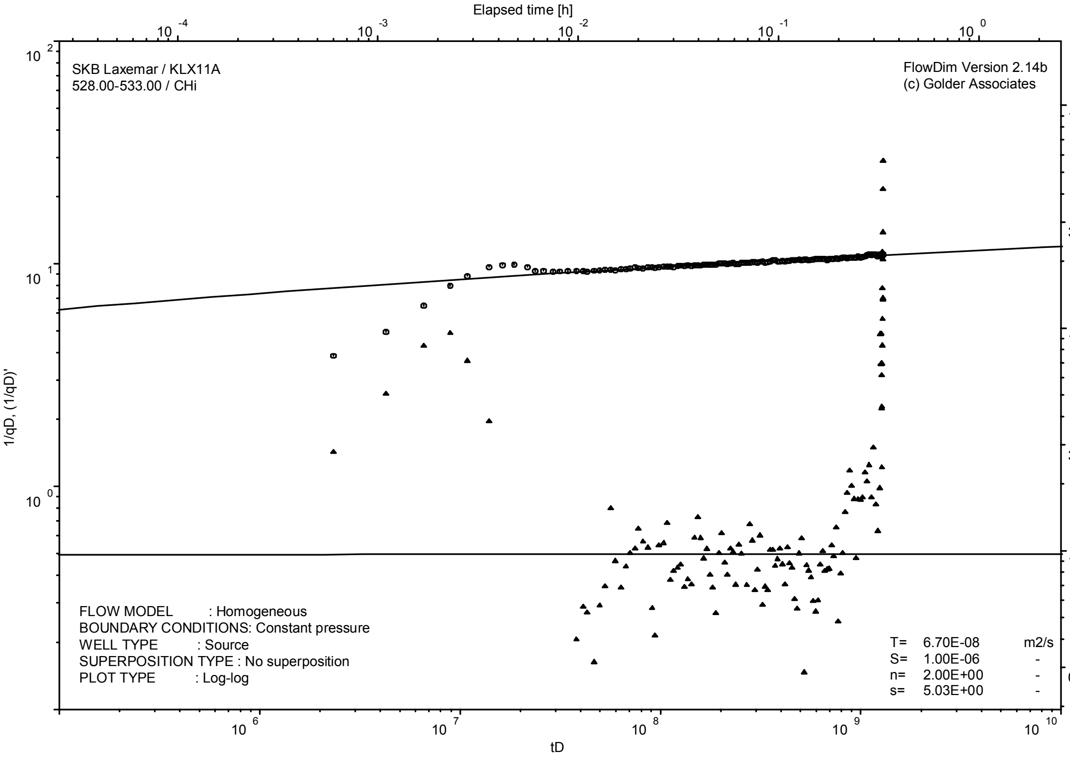
Analysis diagrams



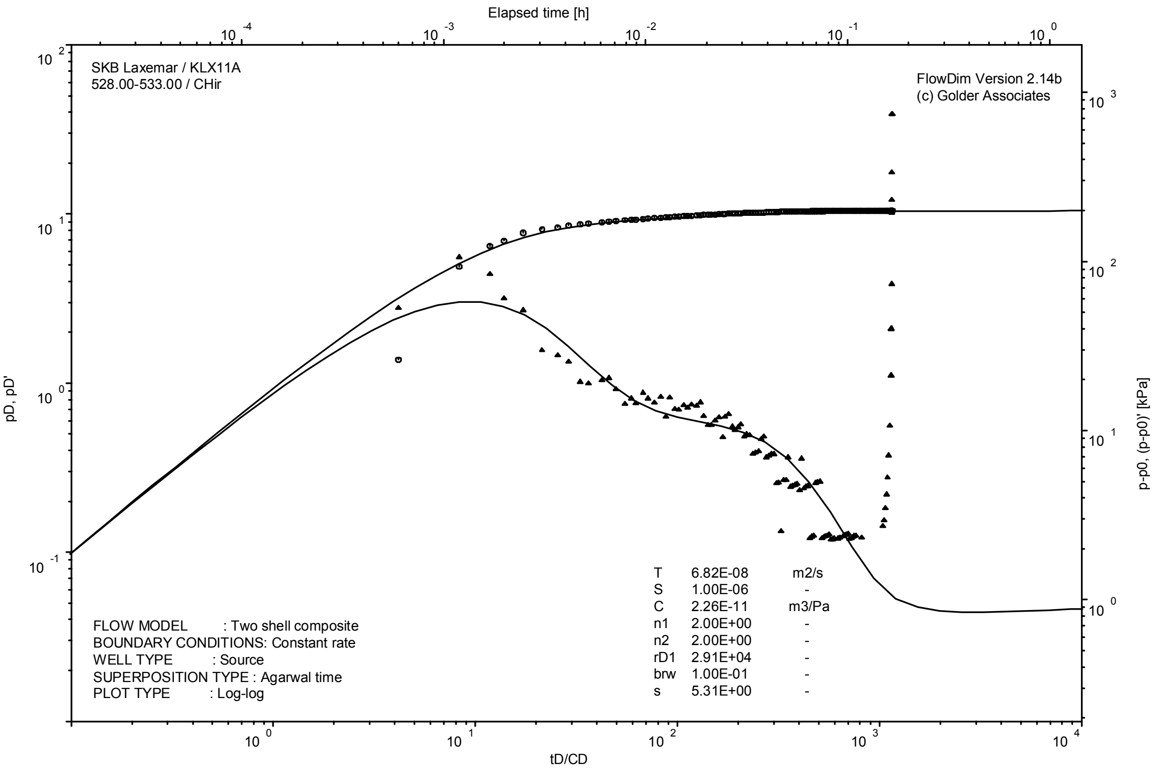
Pressure and flow rate vs. time; cartesian plot



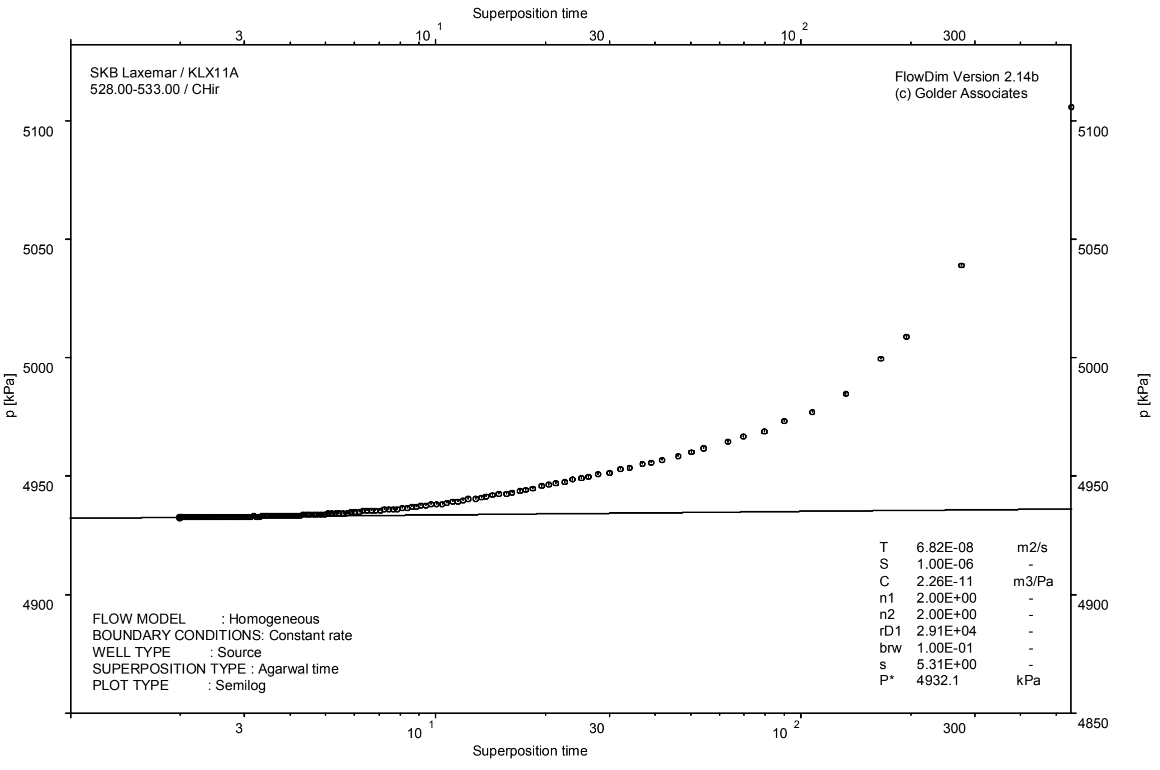
Interval pressure and temperature vs. time; cartesian plot



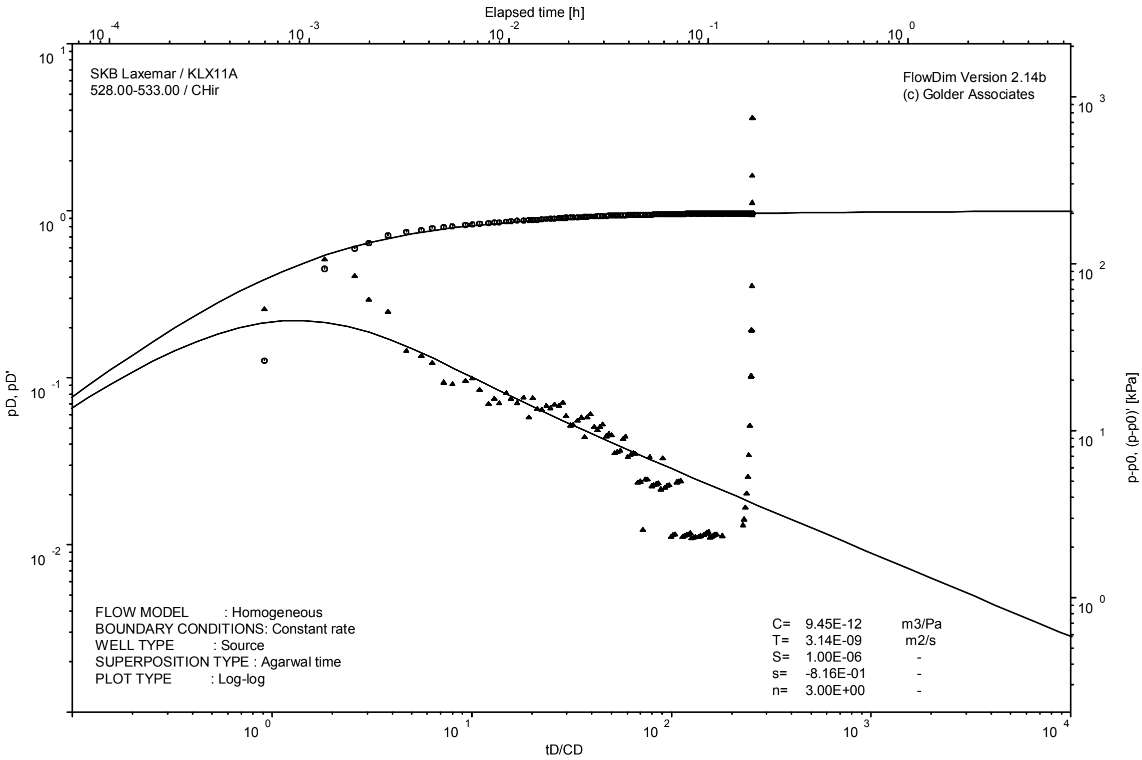
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

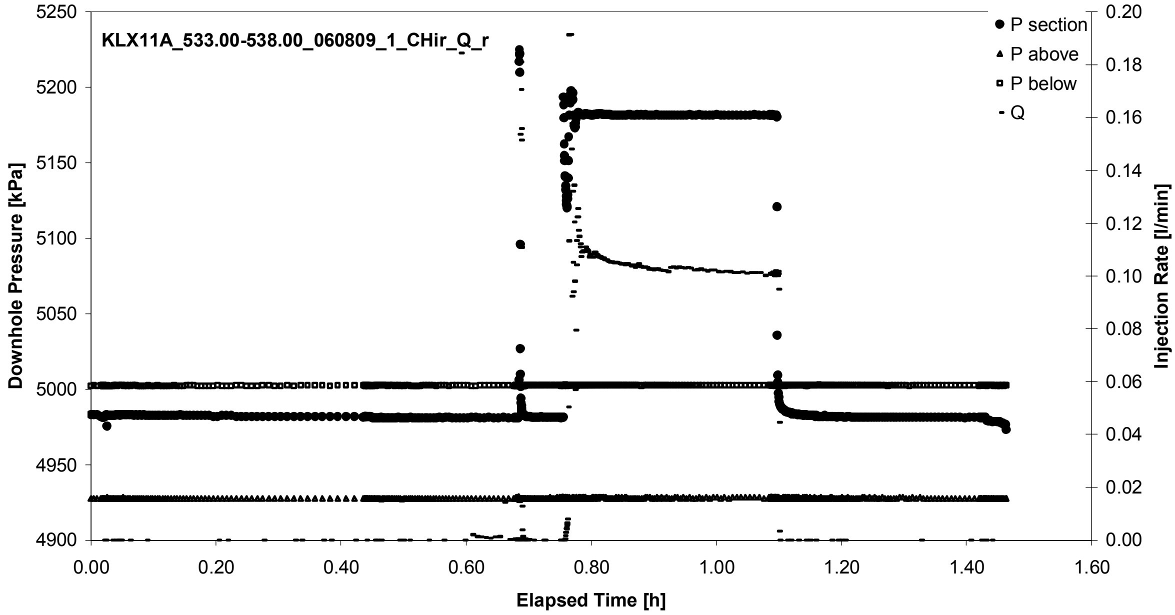


CHIR phase; log-log match (n=3)

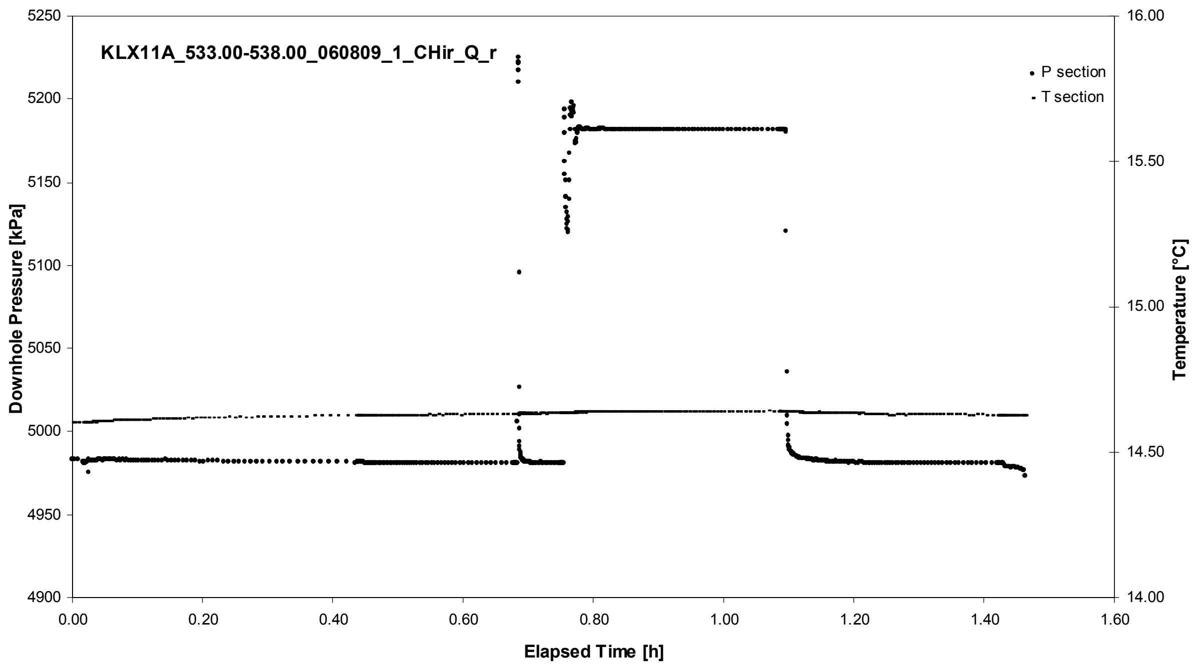
APPENDIX 2-80

Test 533.00 – 538.00 m

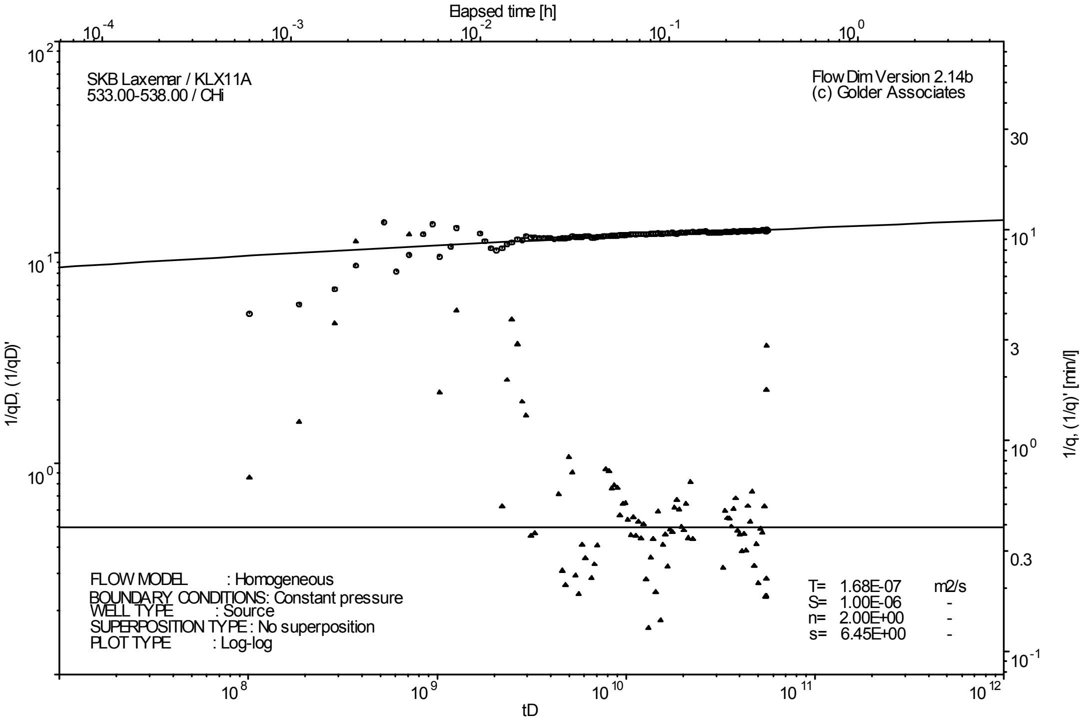
Analysis diagrams



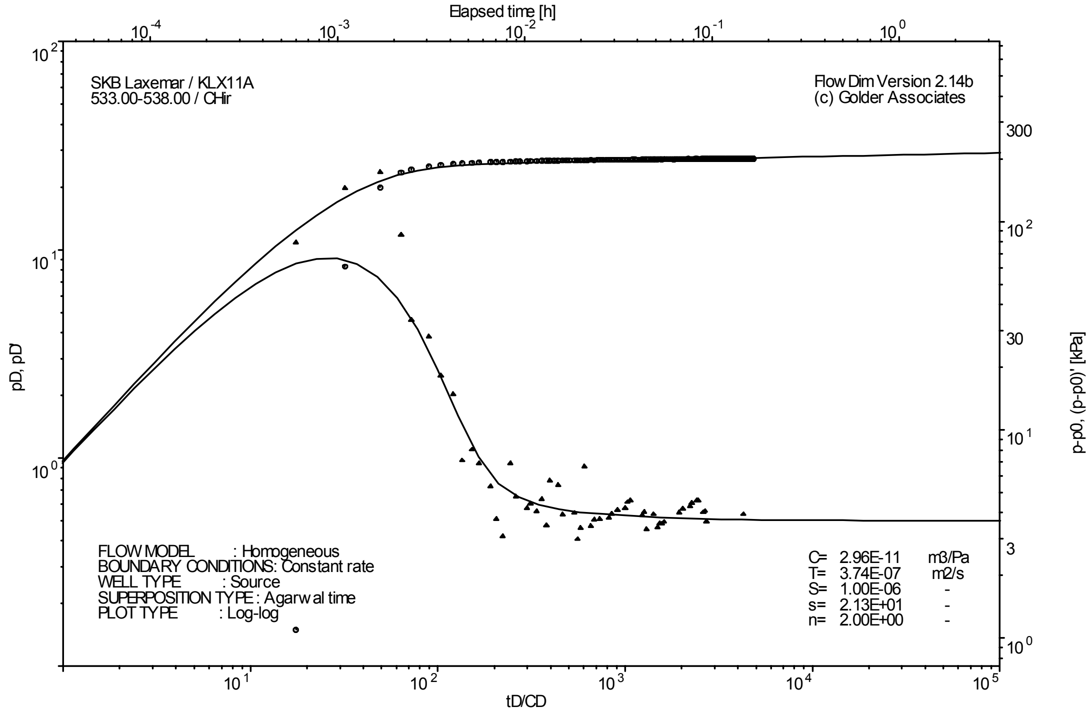
Pressure and flow rate vs. time; cartesian plot



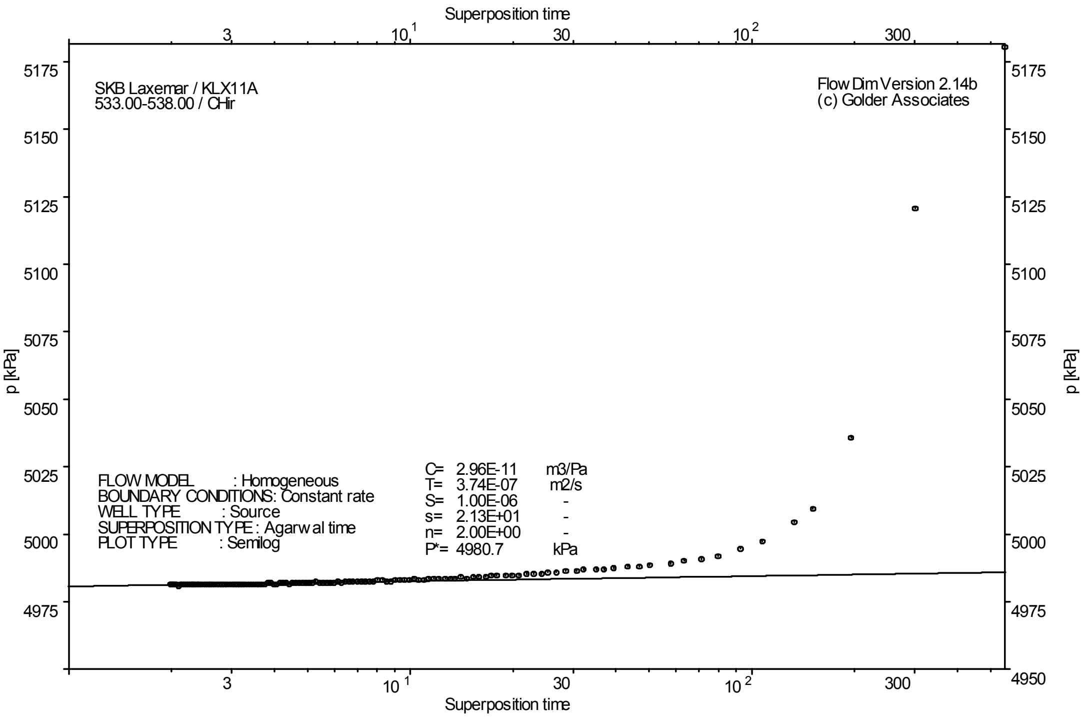
Interval pressure and temperature vs. time; cartesian plot



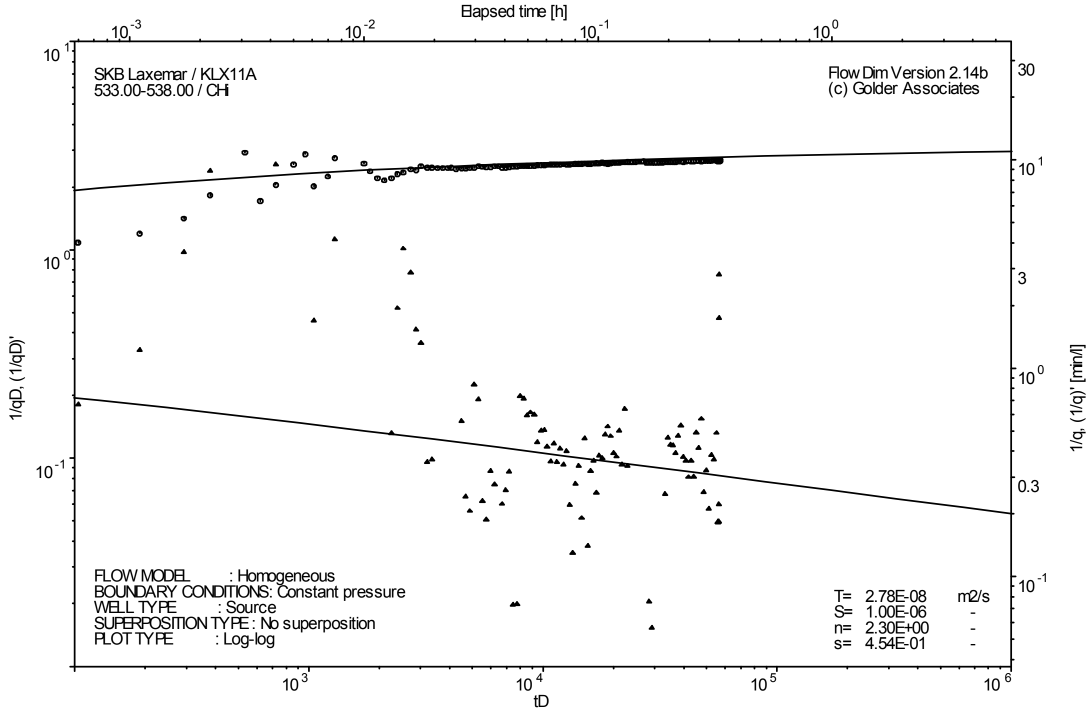
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

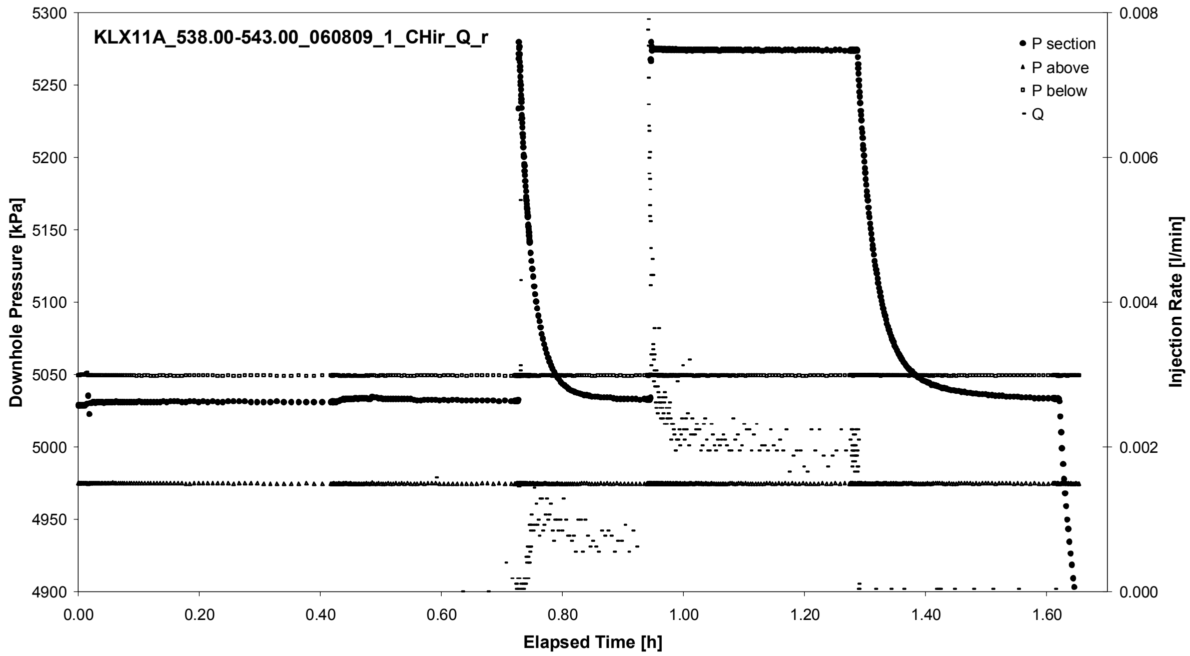


CHI phase; log-log match (n=2.3)

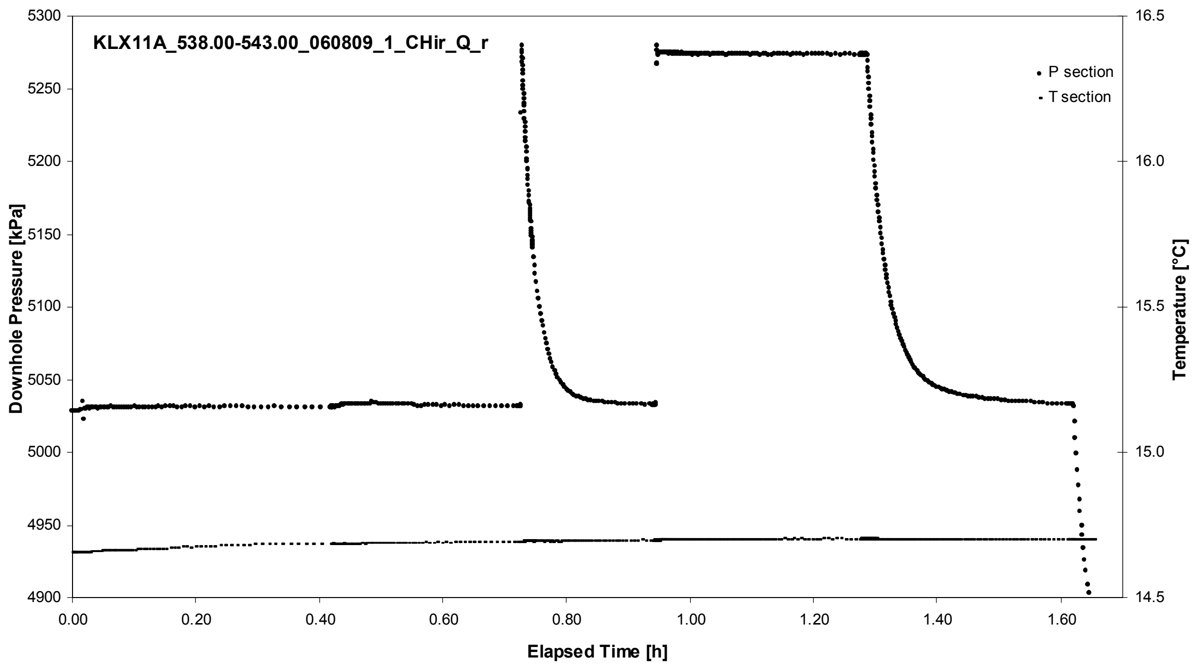
APPENDIX 2-81

Test 538.00 – 543.00 m

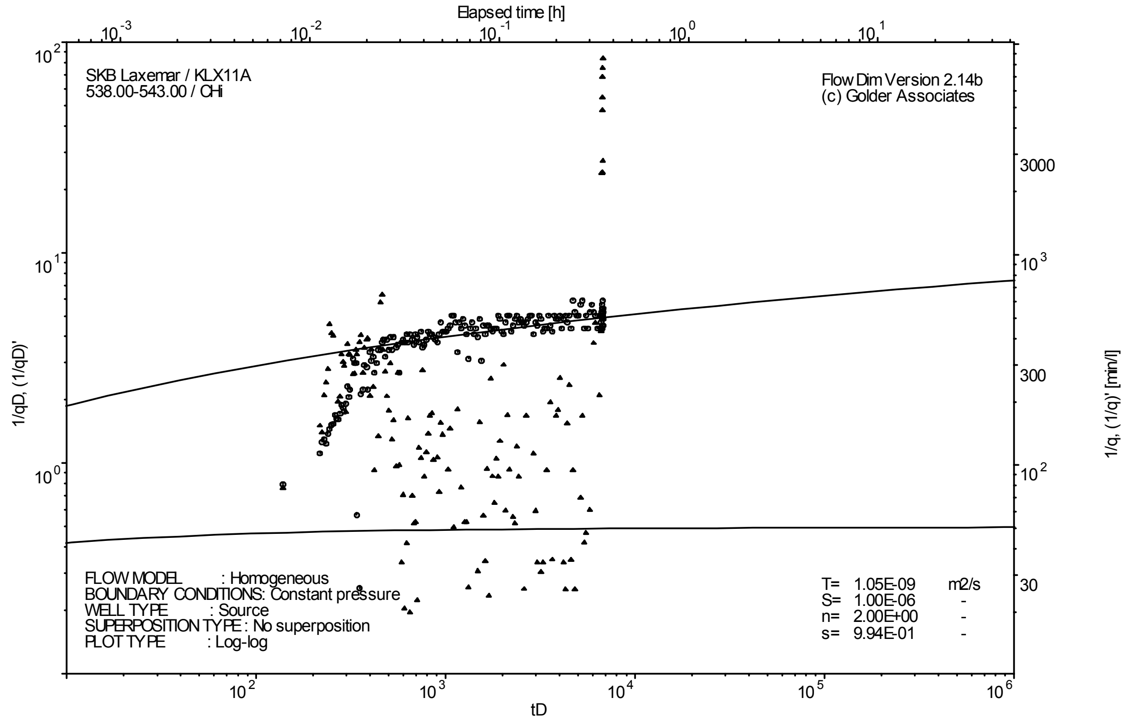
Analysis diagrams



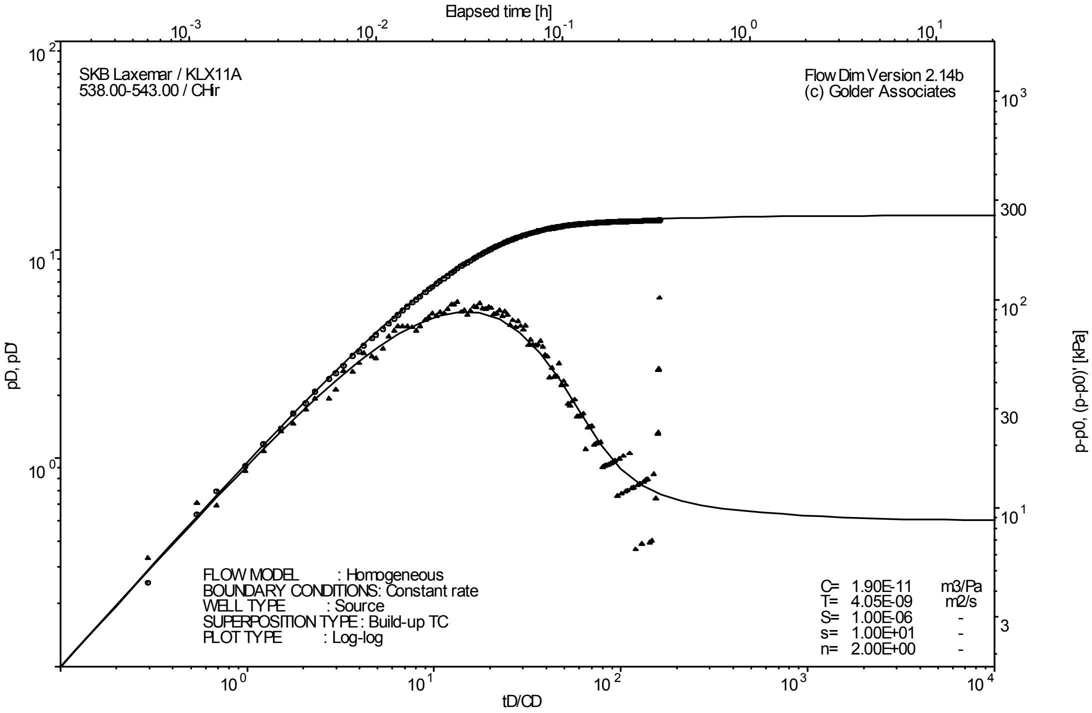
Pressure and flow rate vs. time; cartesian plot



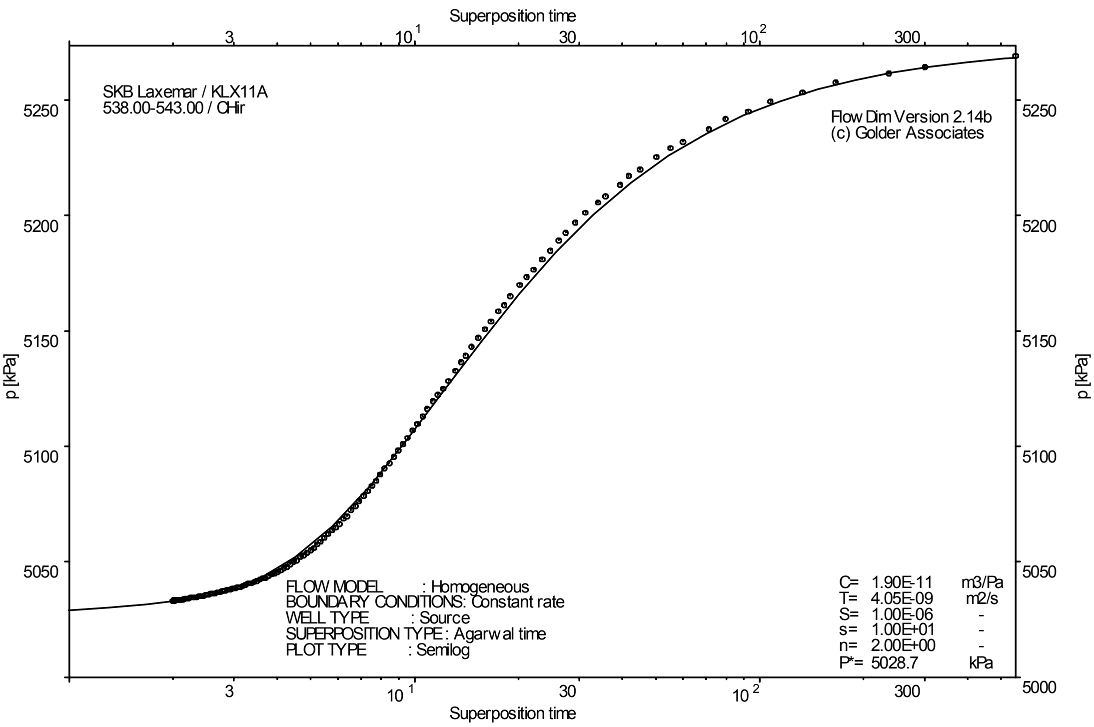
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

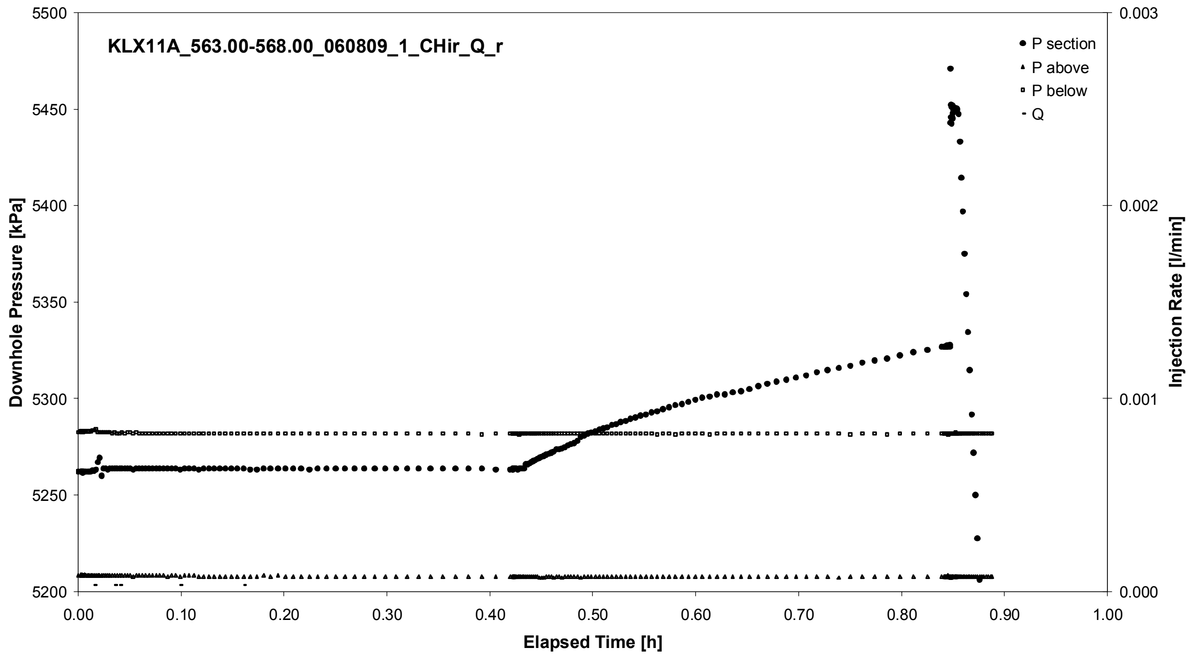


CHIR phase; HORNER match

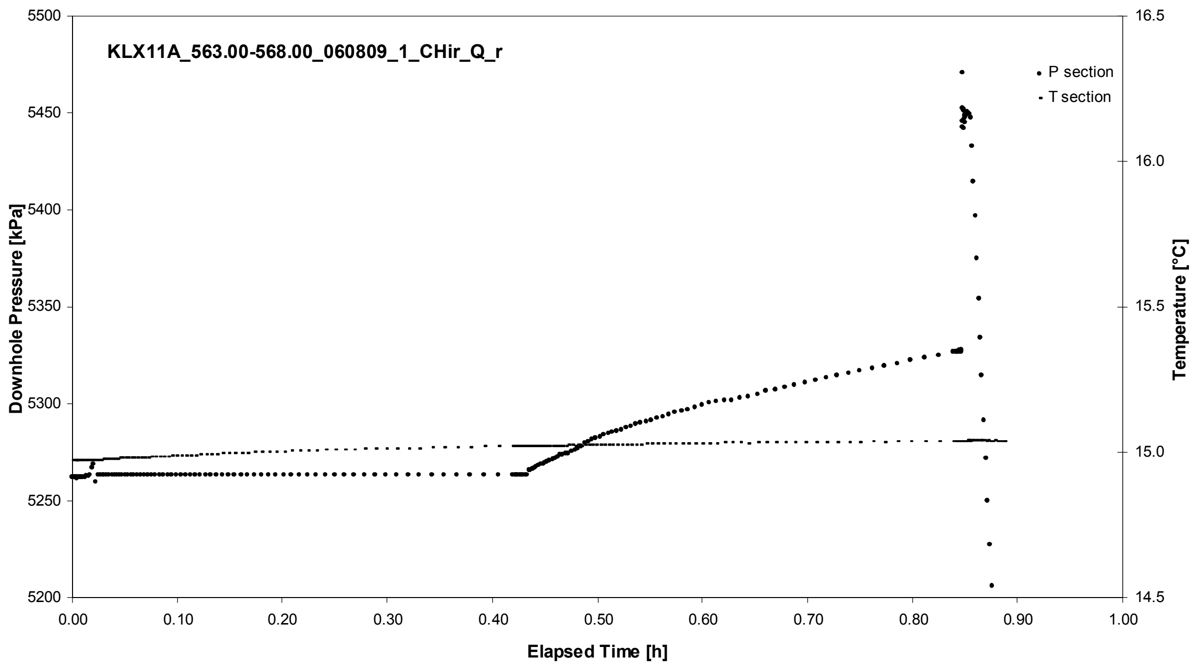
APPENDIX 2-82

Test 563.00 – 568.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

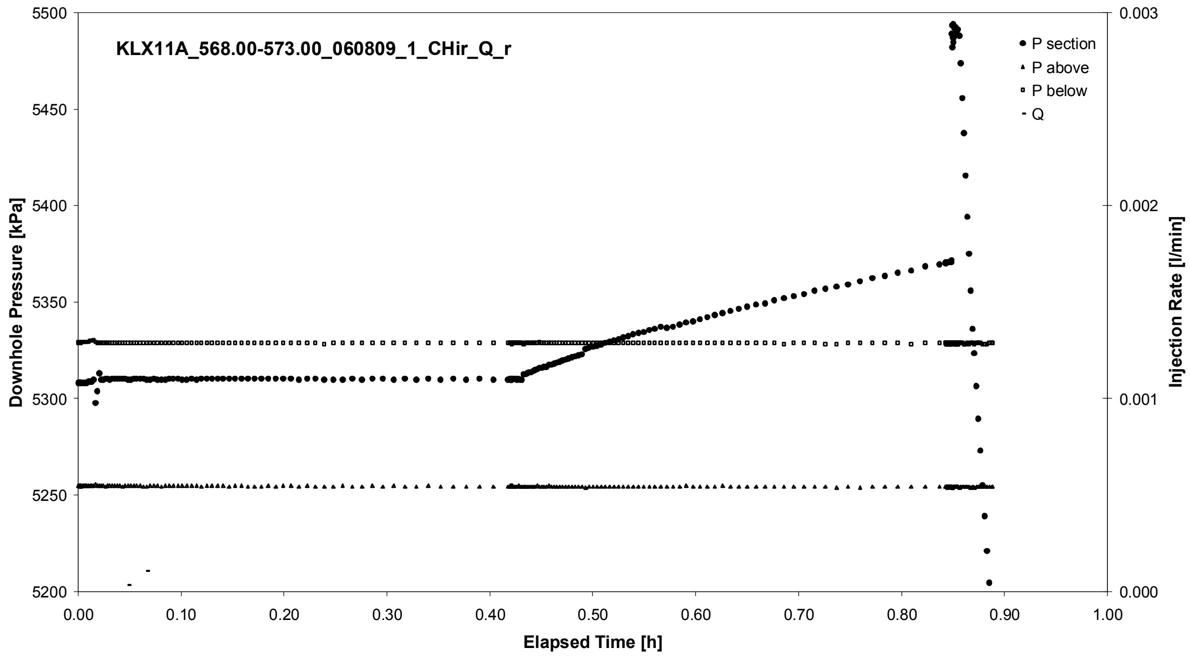
CHIR phase; log-log match

Not analysed

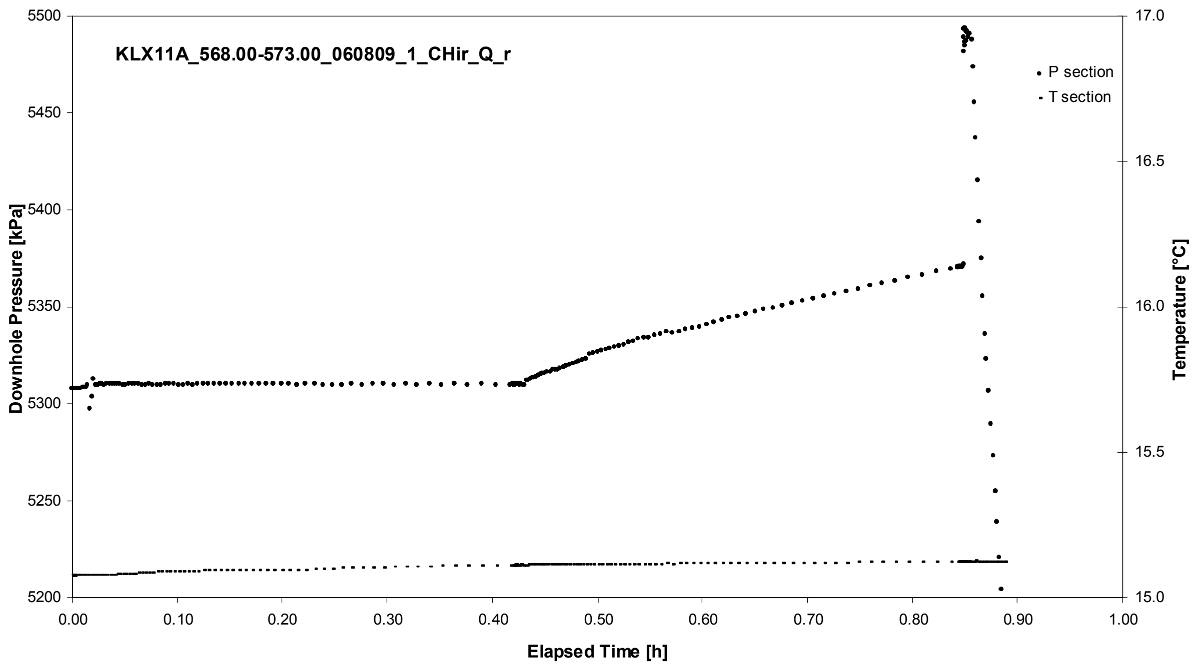
APPENDIX 2-83

Test 568.00 – 573.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

Not analysed

CHI phase; log-log match

Not analysed

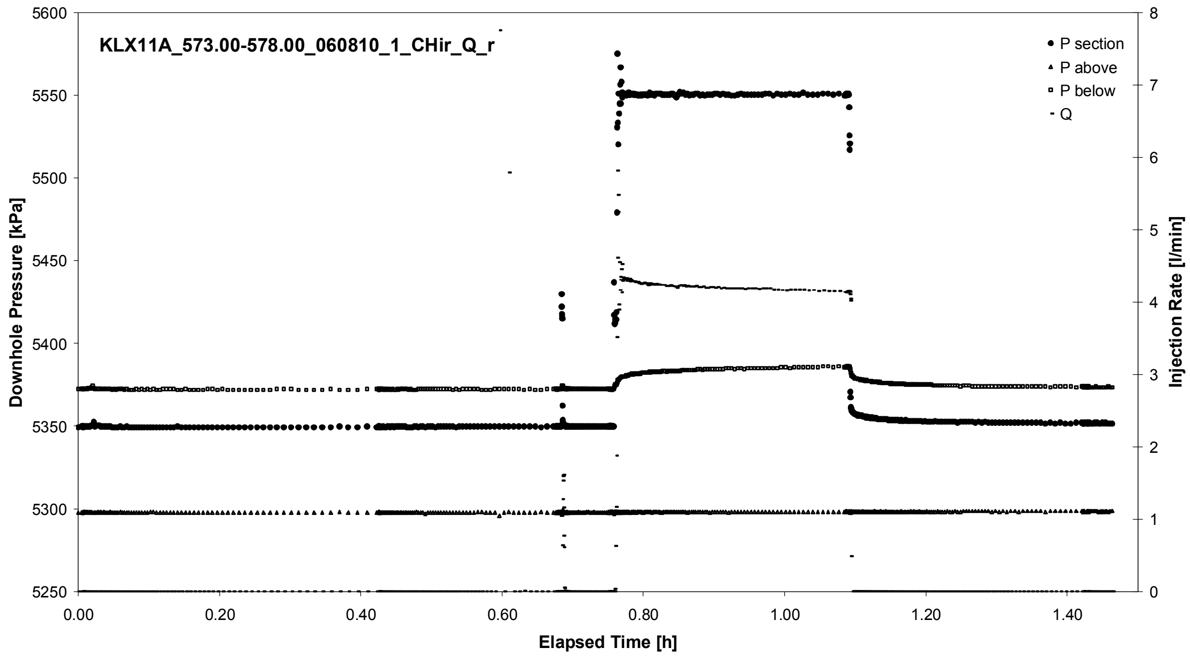
CHIR phase; log-log match

Not analysed

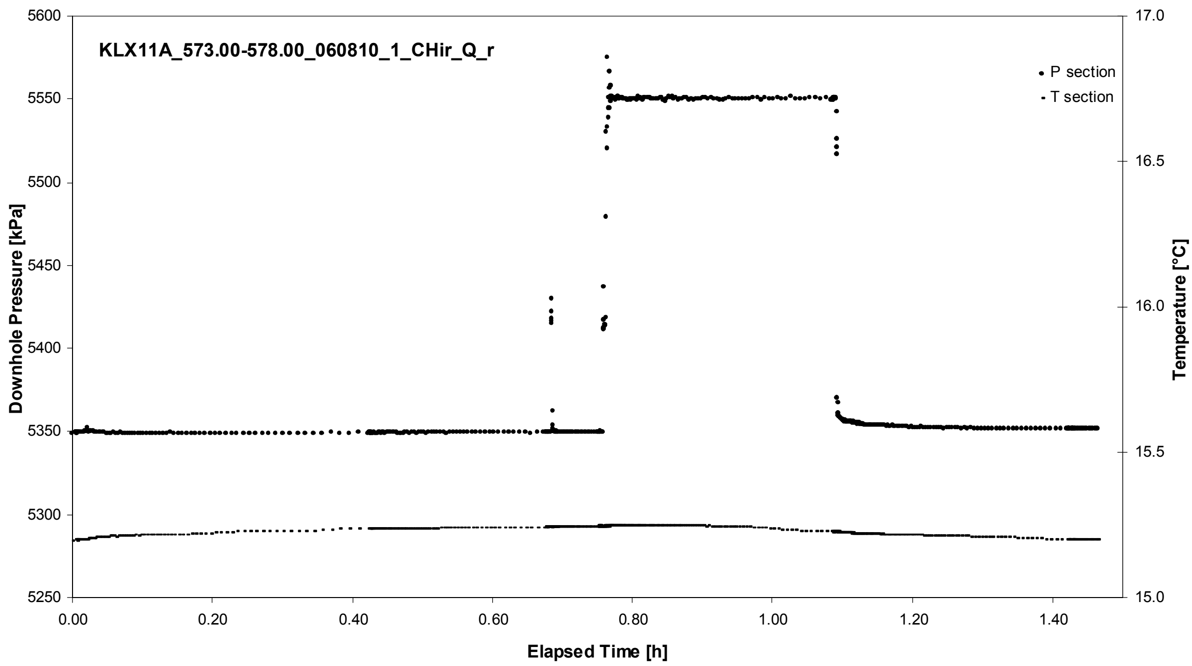
APPENDIX 2-84

Test 573.00 – 578.00 m

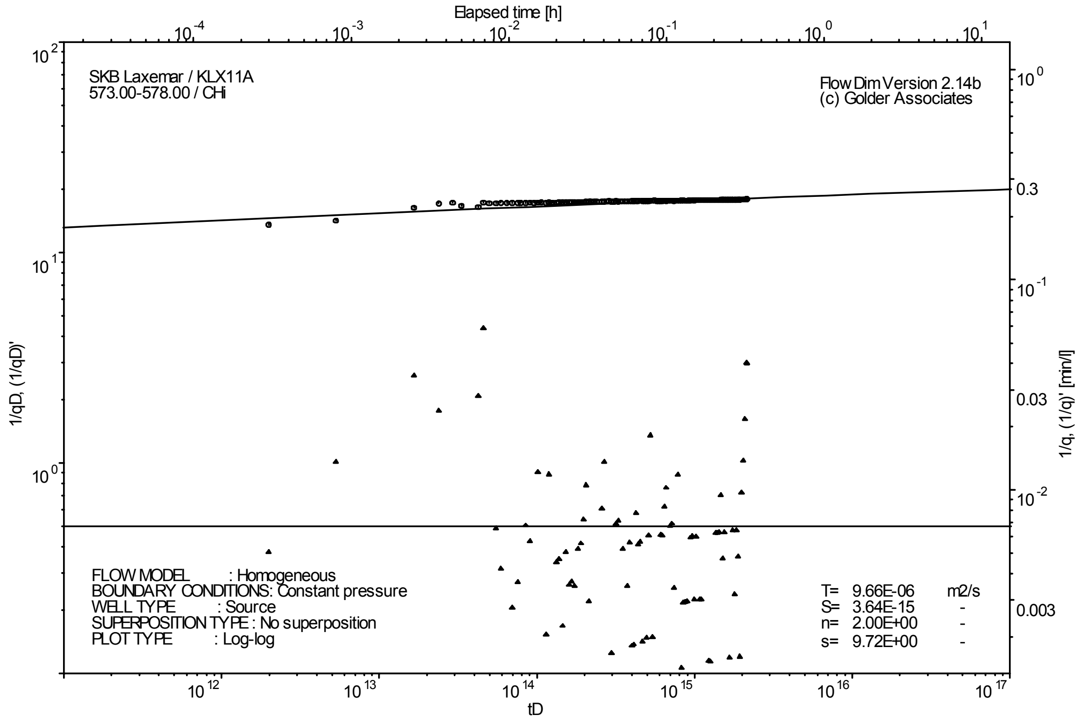
Analysis diagrams



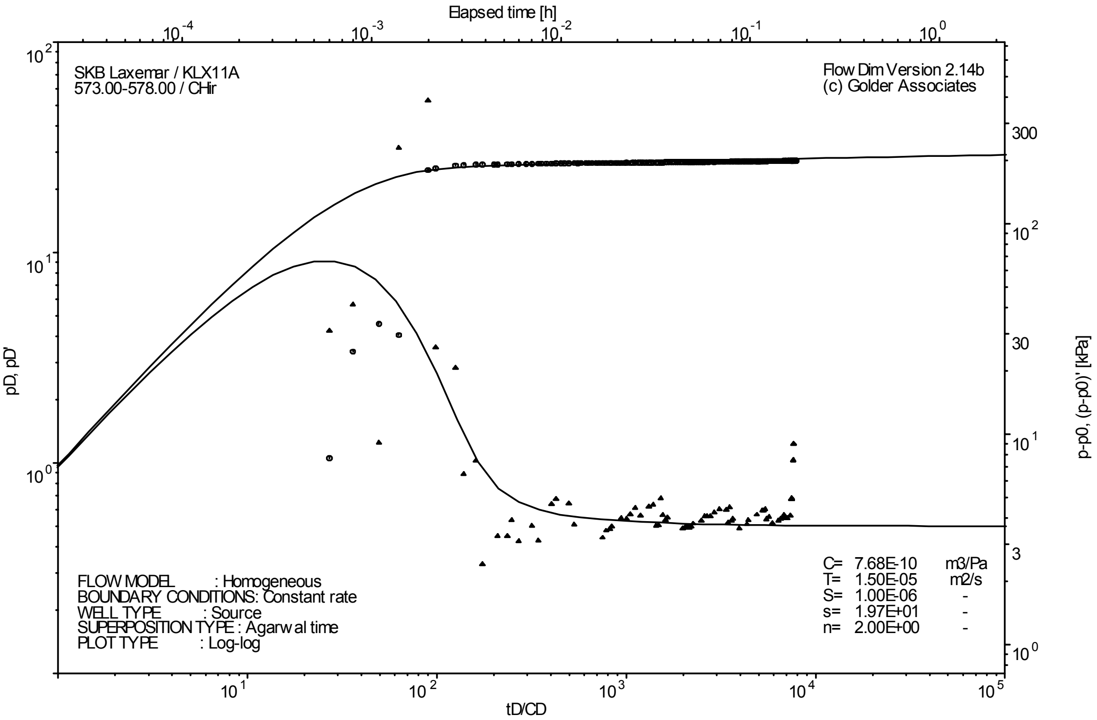
Pressure and flow rate vs. time; cartesian plot



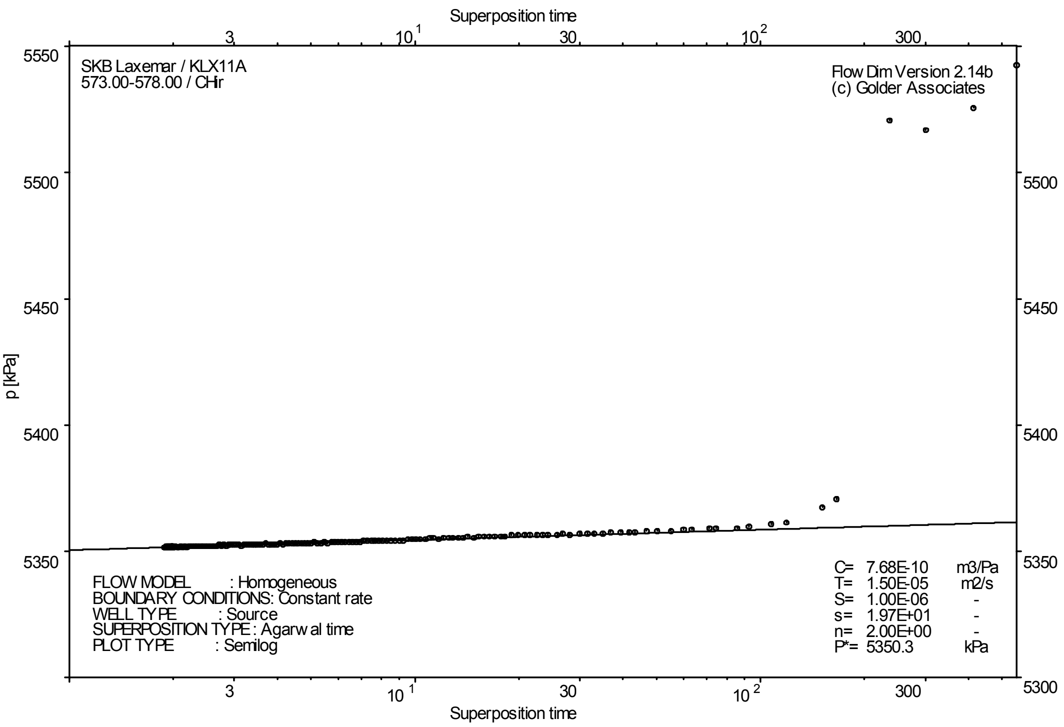
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

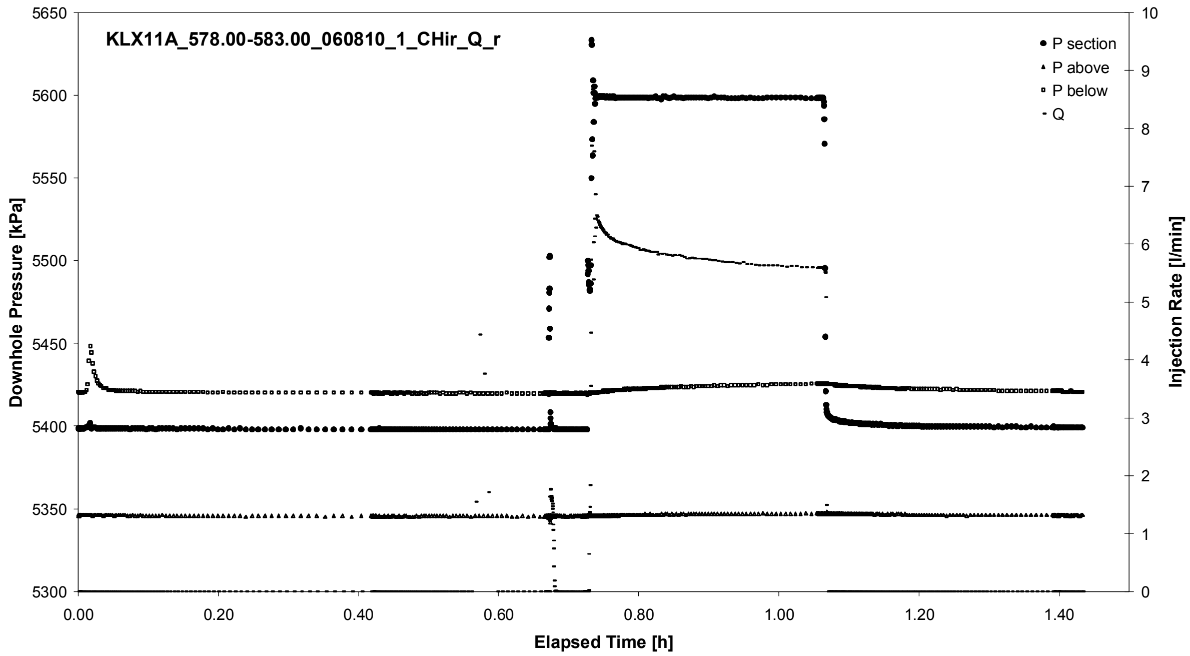


CHIR phase; HORNER match

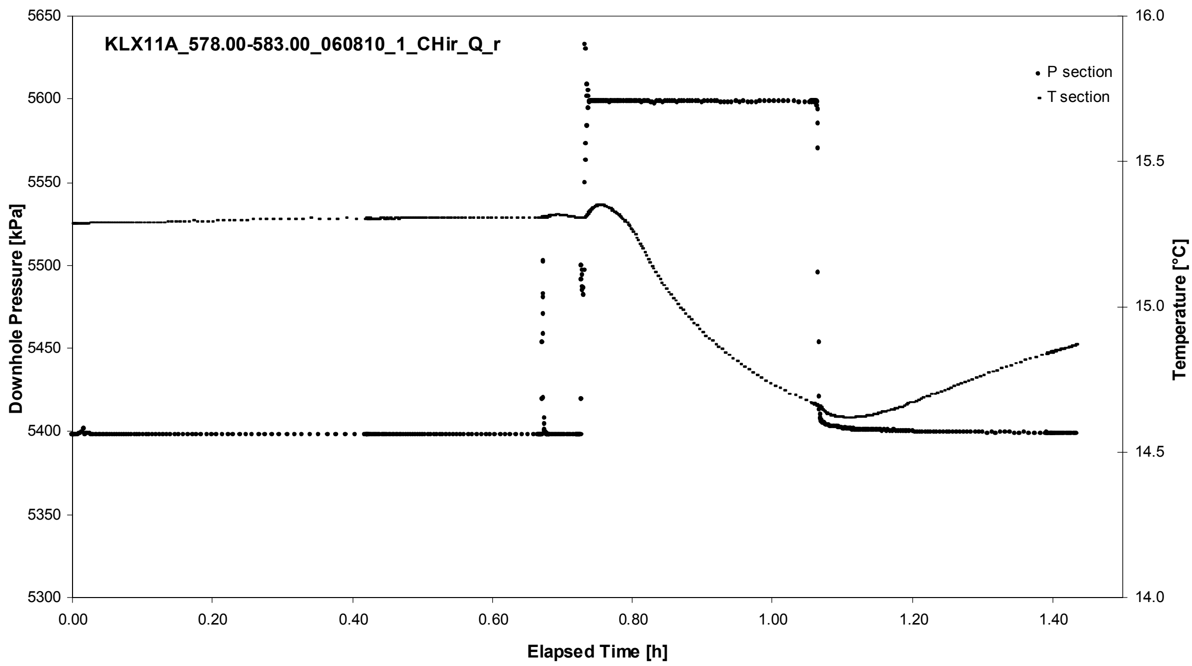
APPENDIX 2-85

Test 578.00 – 583.00 m

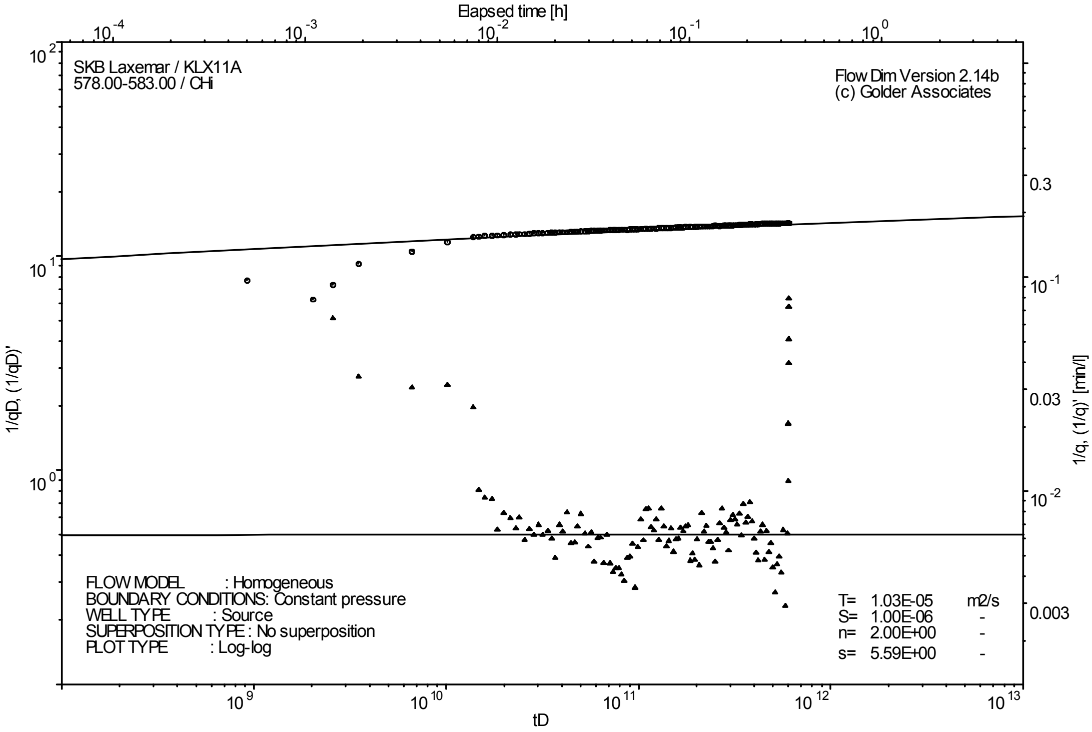
Analysis diagrams



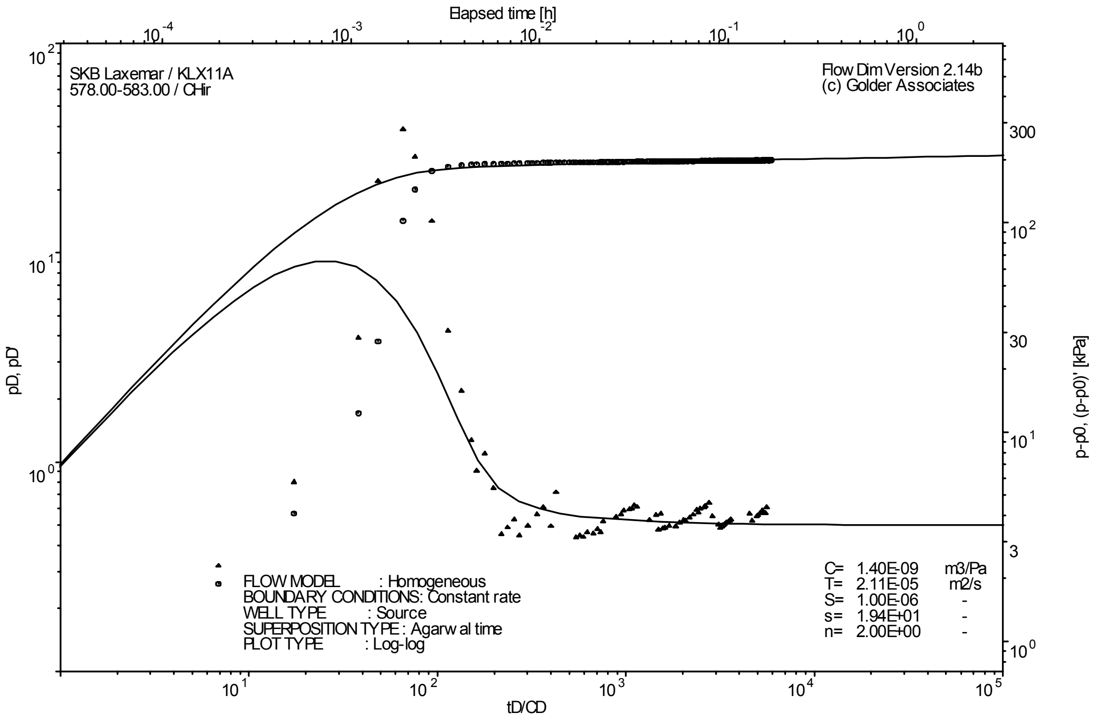
Pressure and flow rate vs. time; cartesian plot



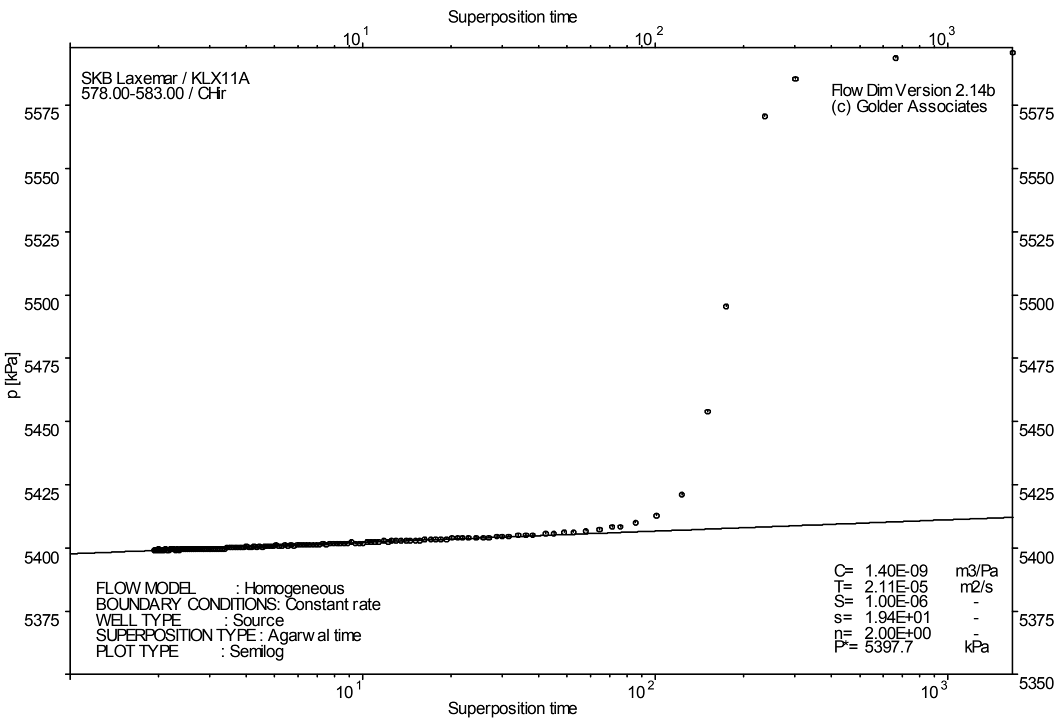
Interval pressure and temperature vs. time; cartesian plot



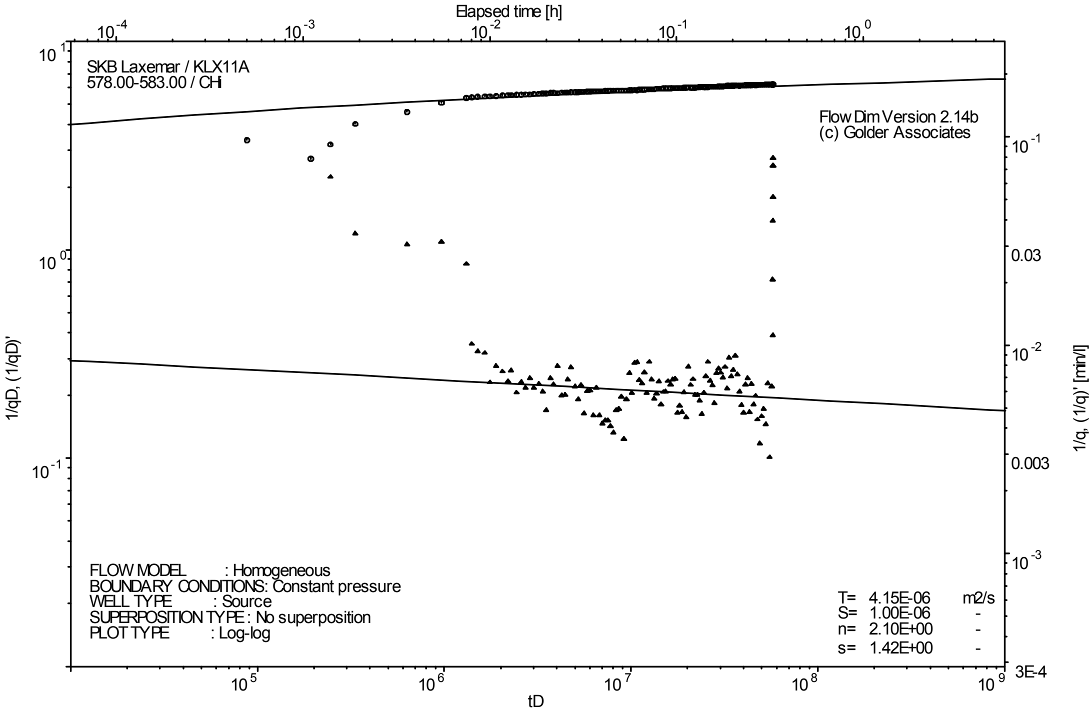
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

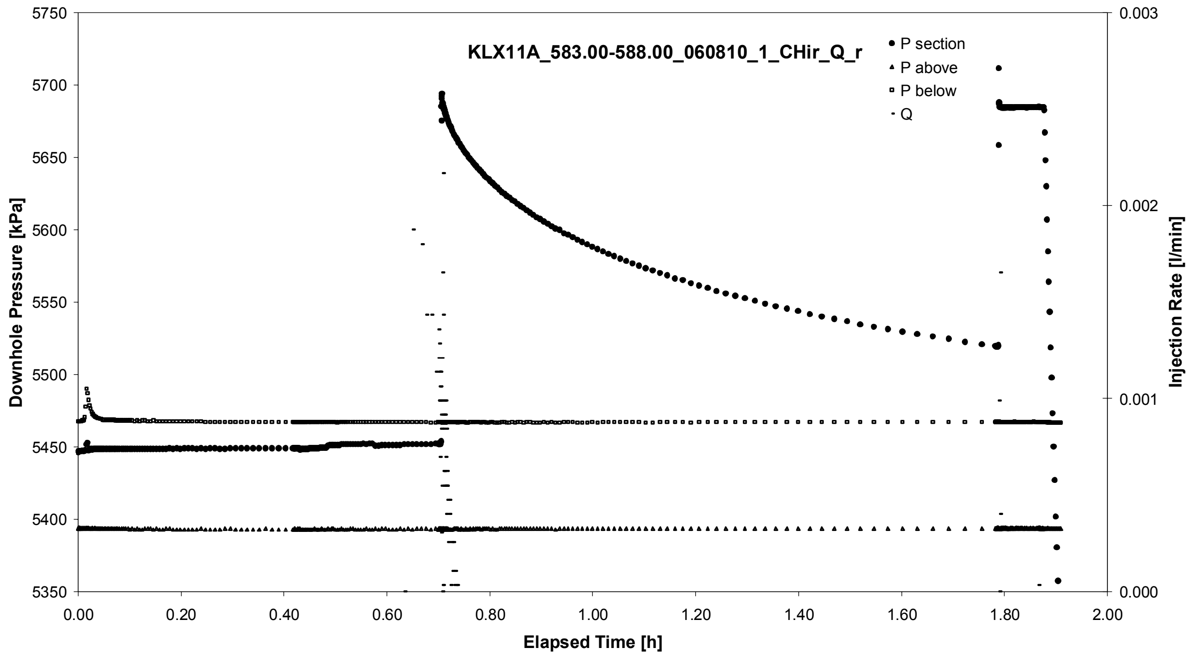


CHI phase; log-log match (n=2.1)

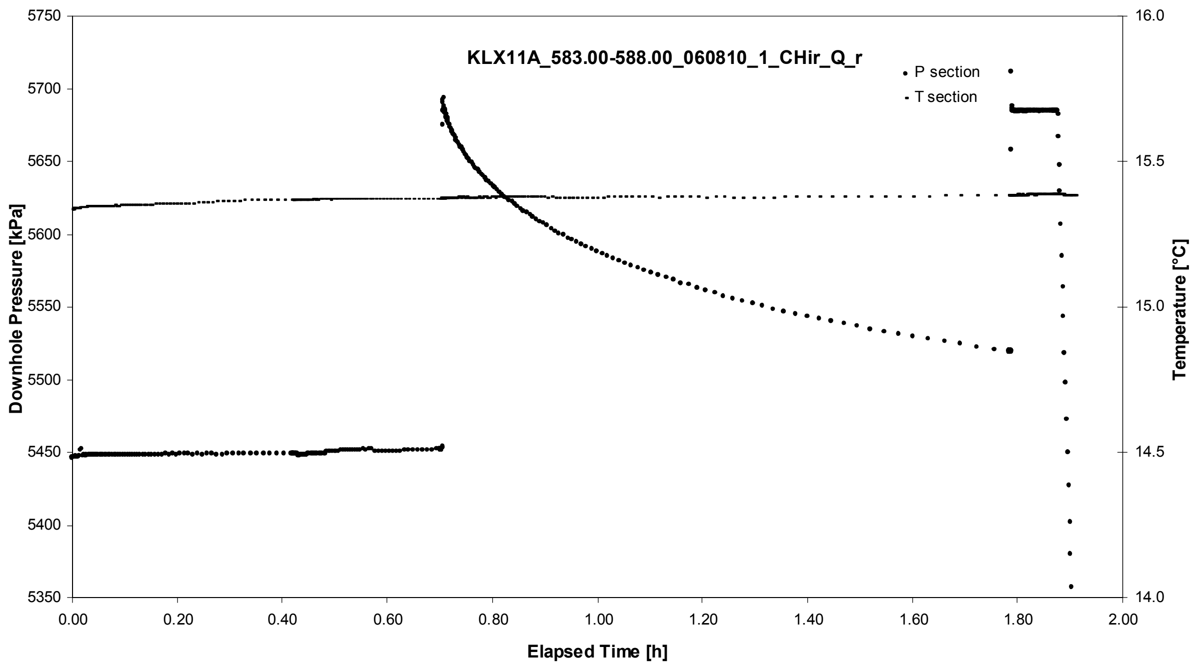
APPENDIX 2-86

Test 583.00 – 588.00 m

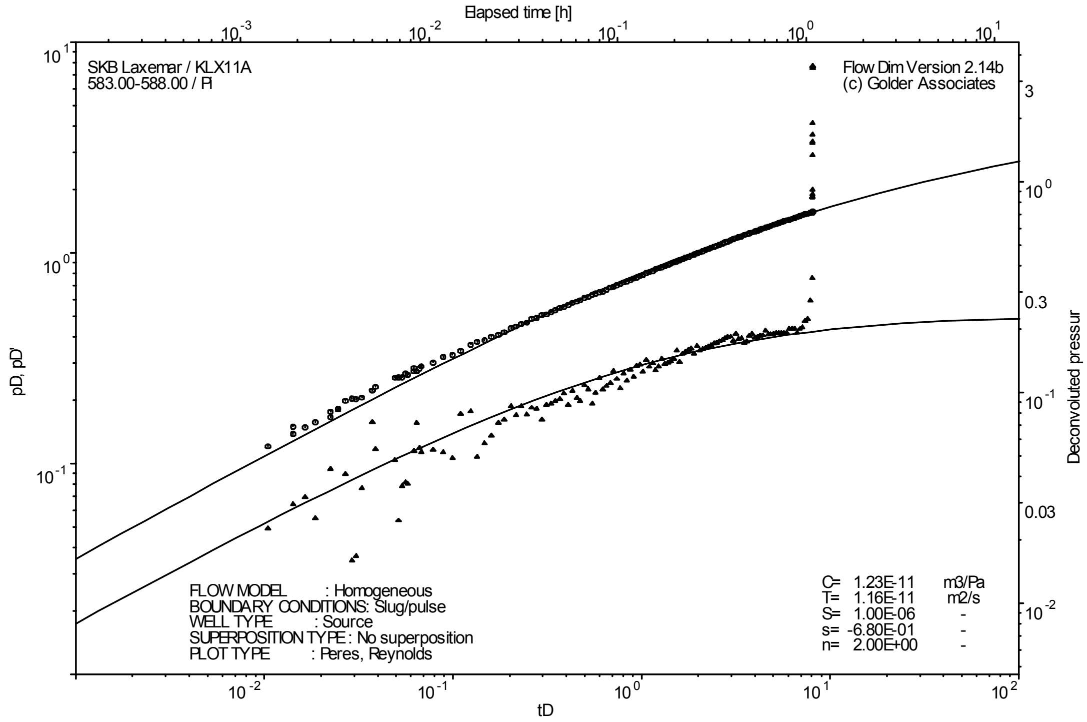
Analysis diagrams



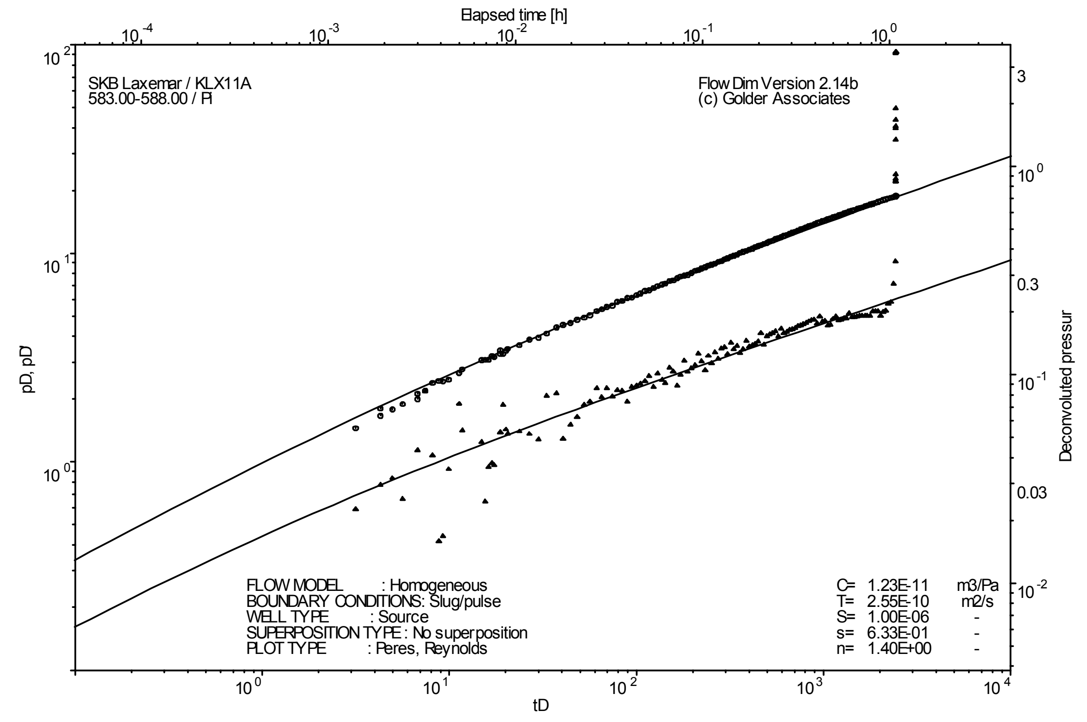
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



Pulse injection; deconvolution match

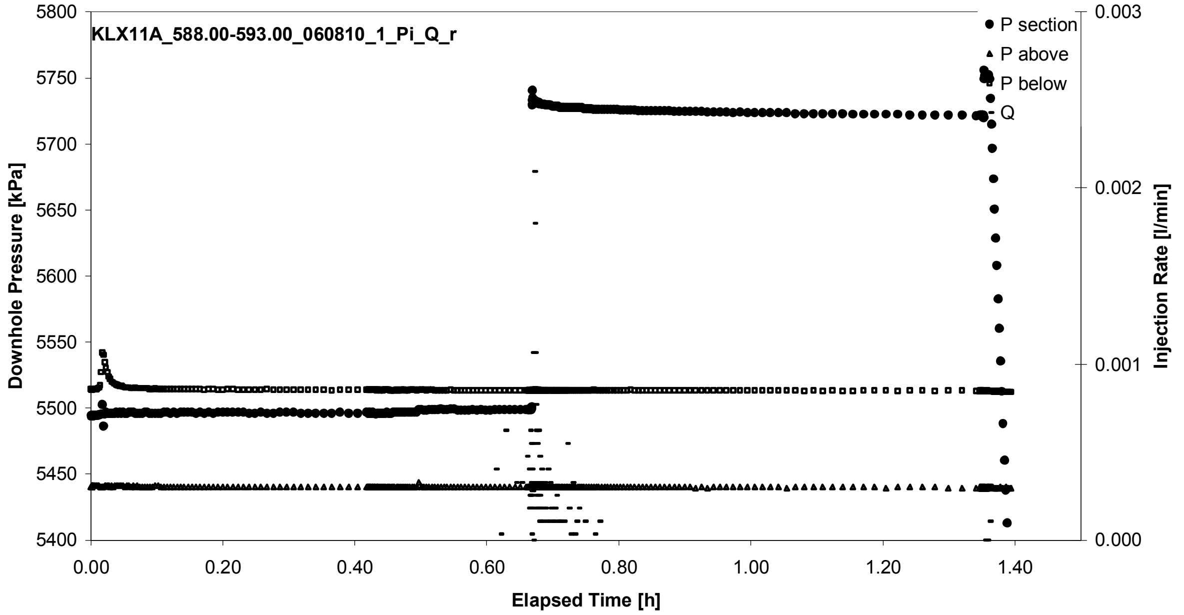


Pulse injection; deconvolution match (n=1.4)

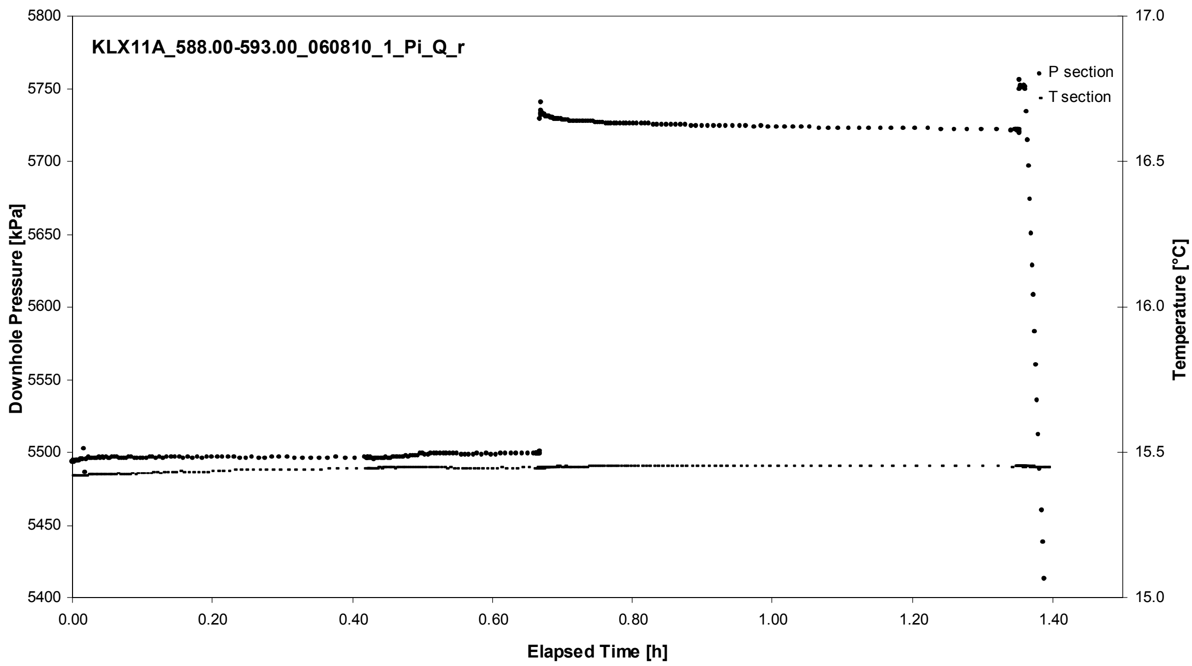
APPENDIX 2-87

Test 588.00 – 593.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

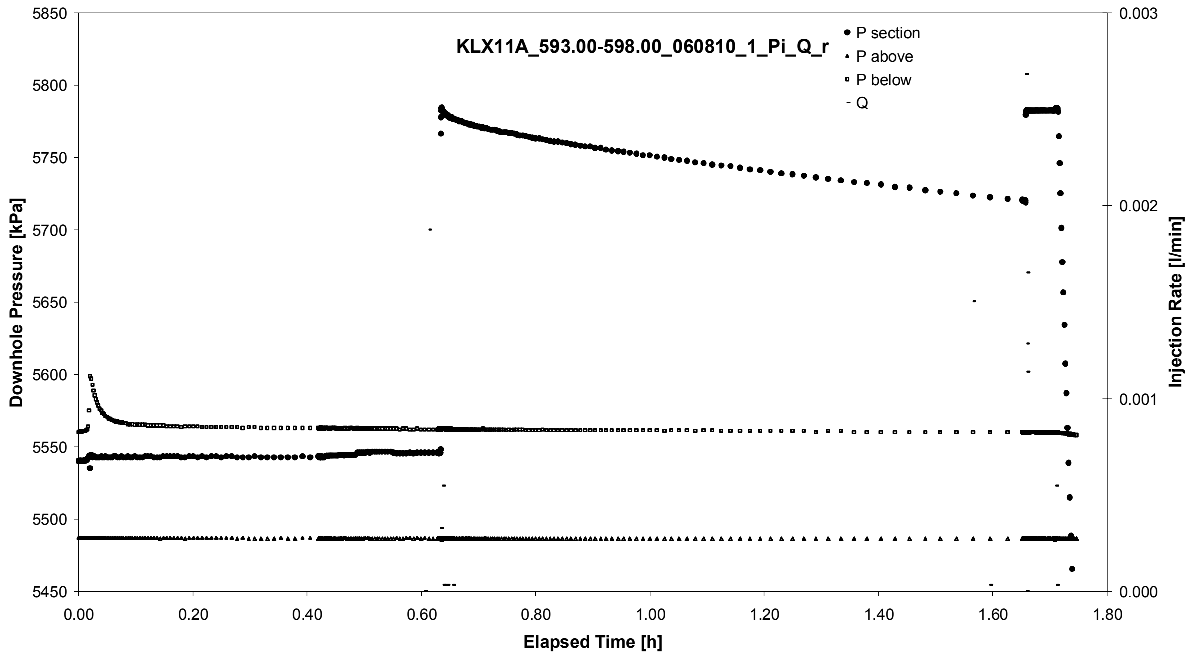
Not analysed

Pulse injection; deconvolution match

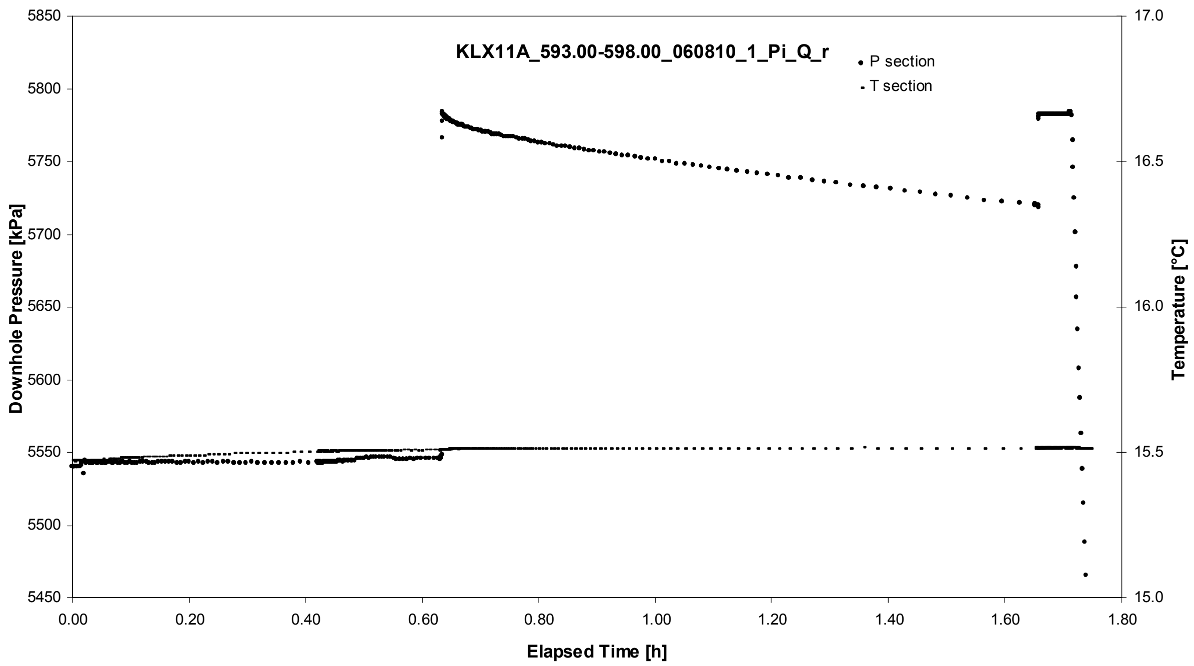
APPENDIX 2-88

Test 593.00 – 598.00 m

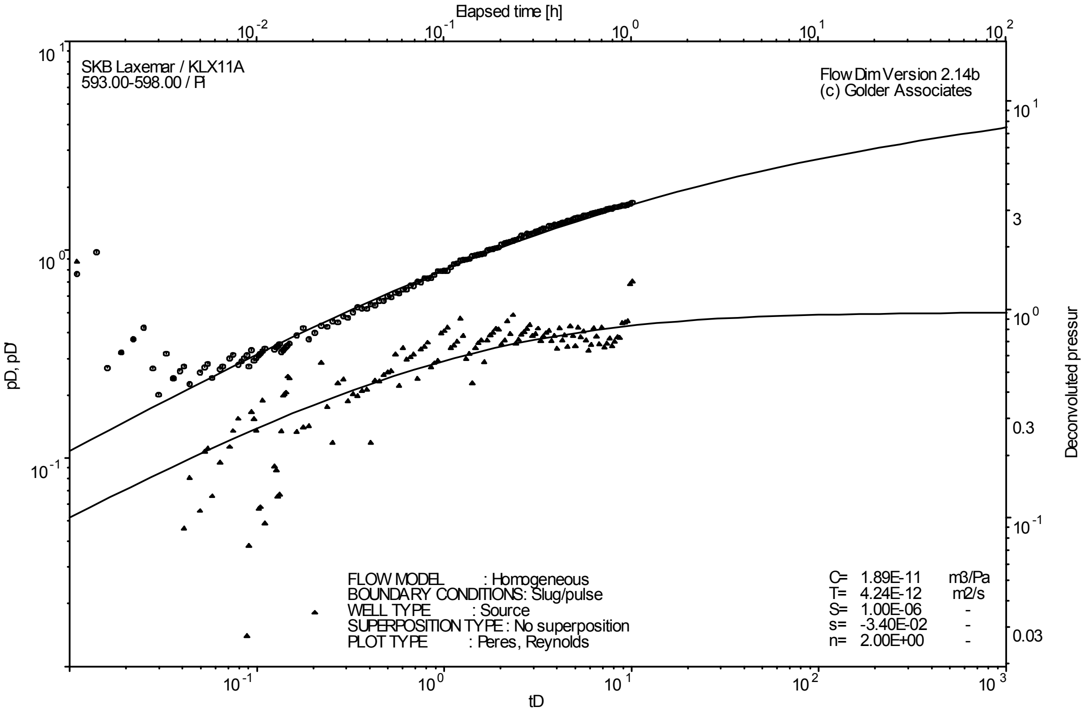
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

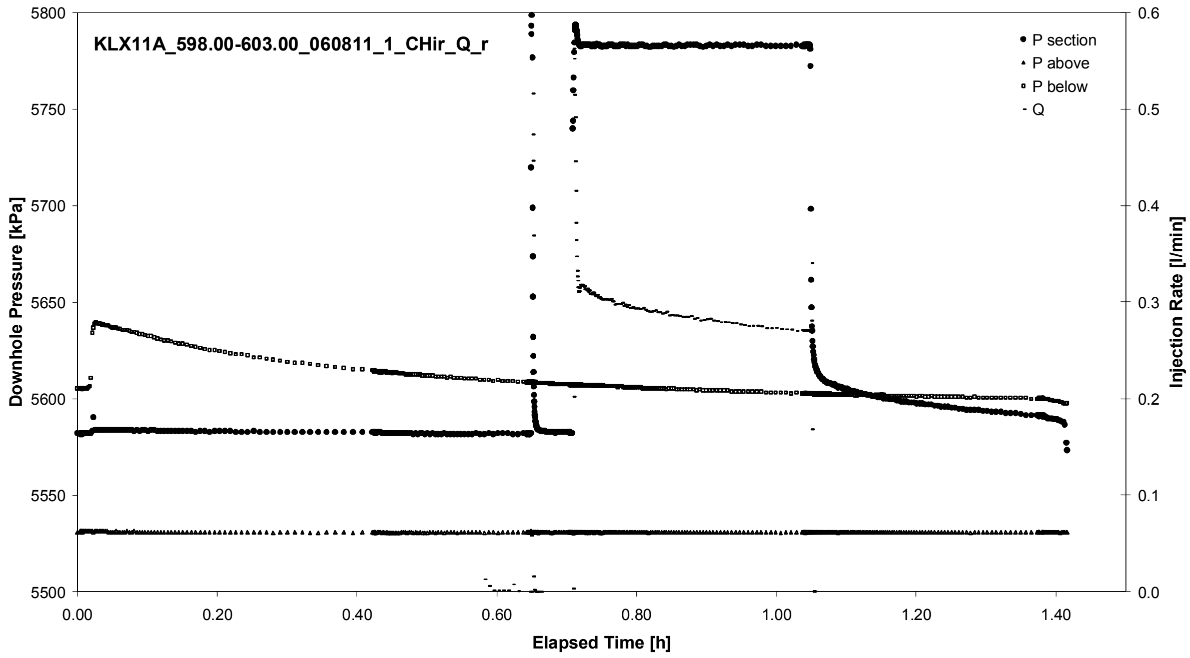


Pulse injection; deconvolution match

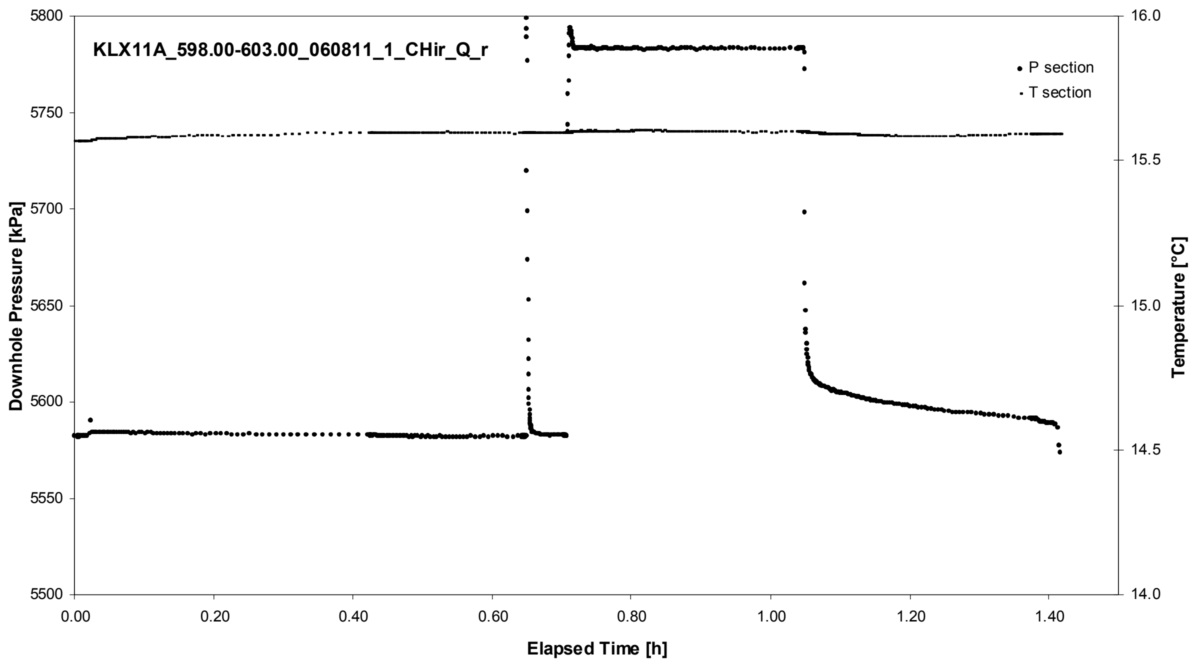
APPENDIX 2-89

Test 598.00 – 603.00 m

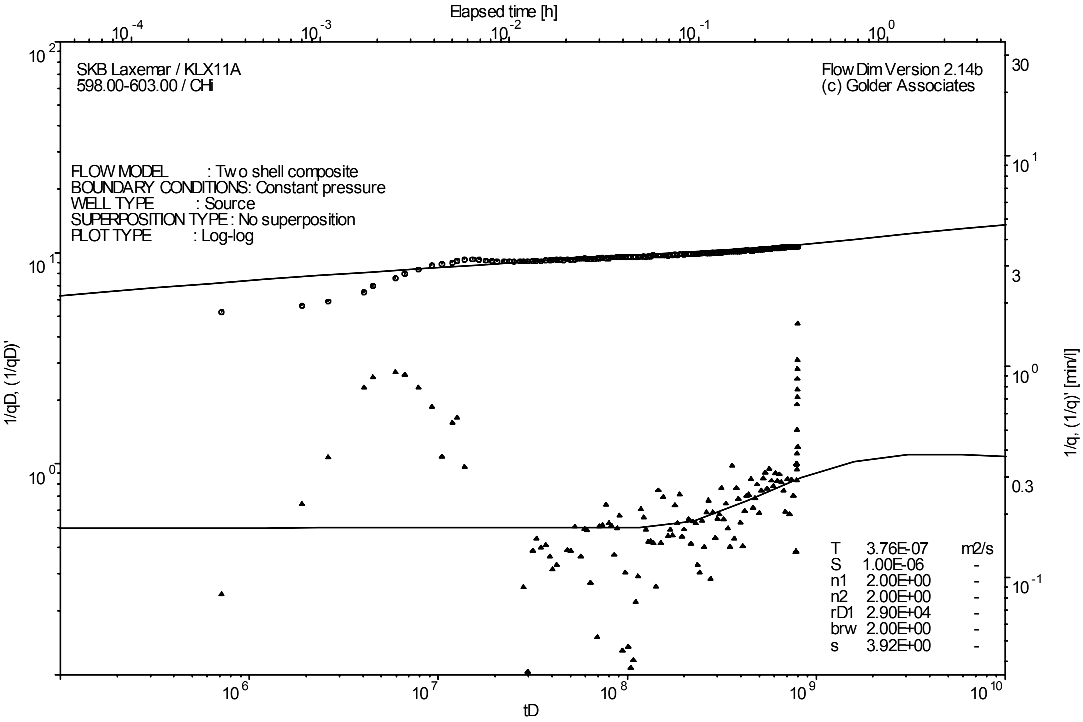
Analysis diagrams



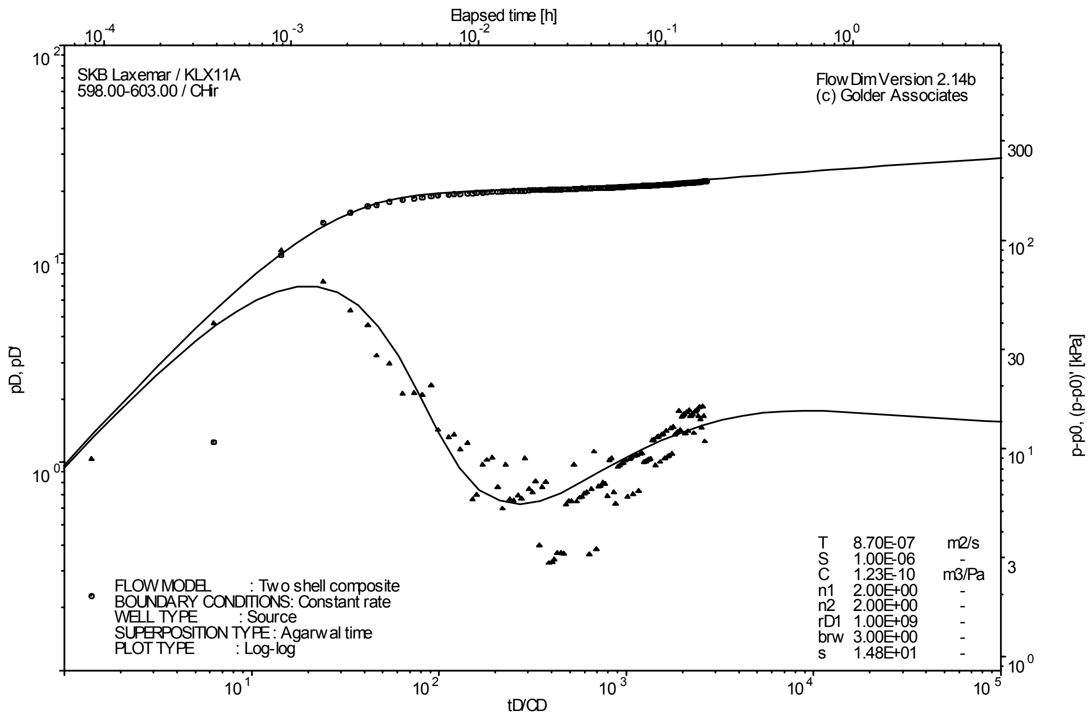
Pressure and flow rate vs. time; cartesian plot



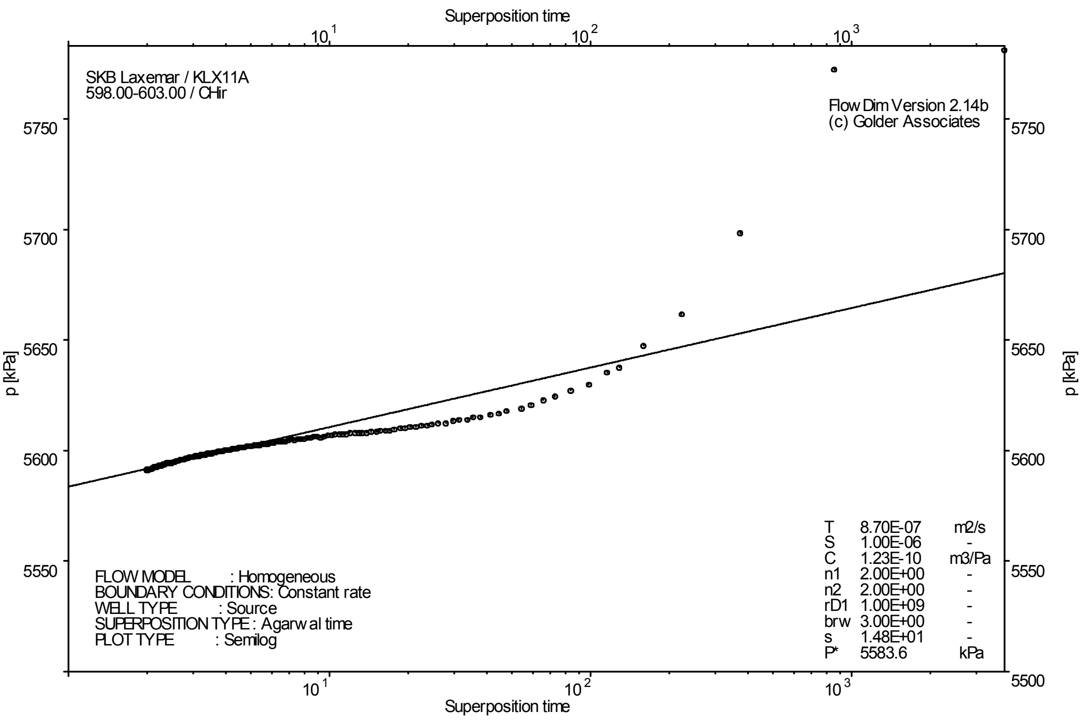
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

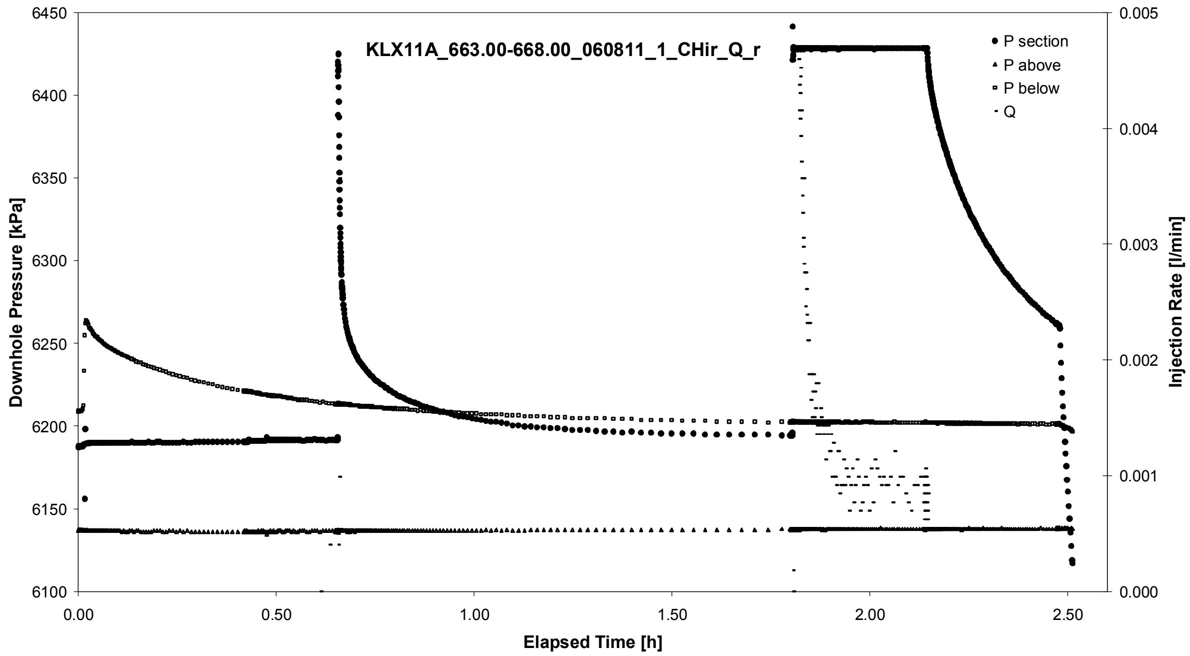


CHIR phase; HORNER match

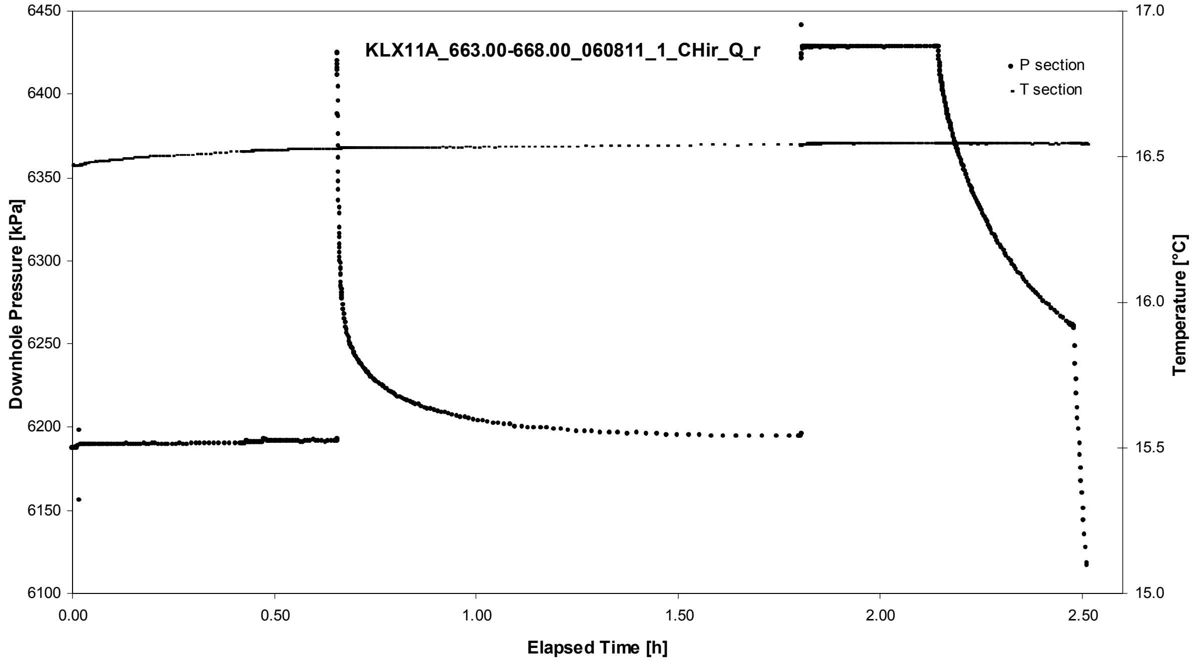
APPENDIX 2-90

Test 663.00 – 668.00 m

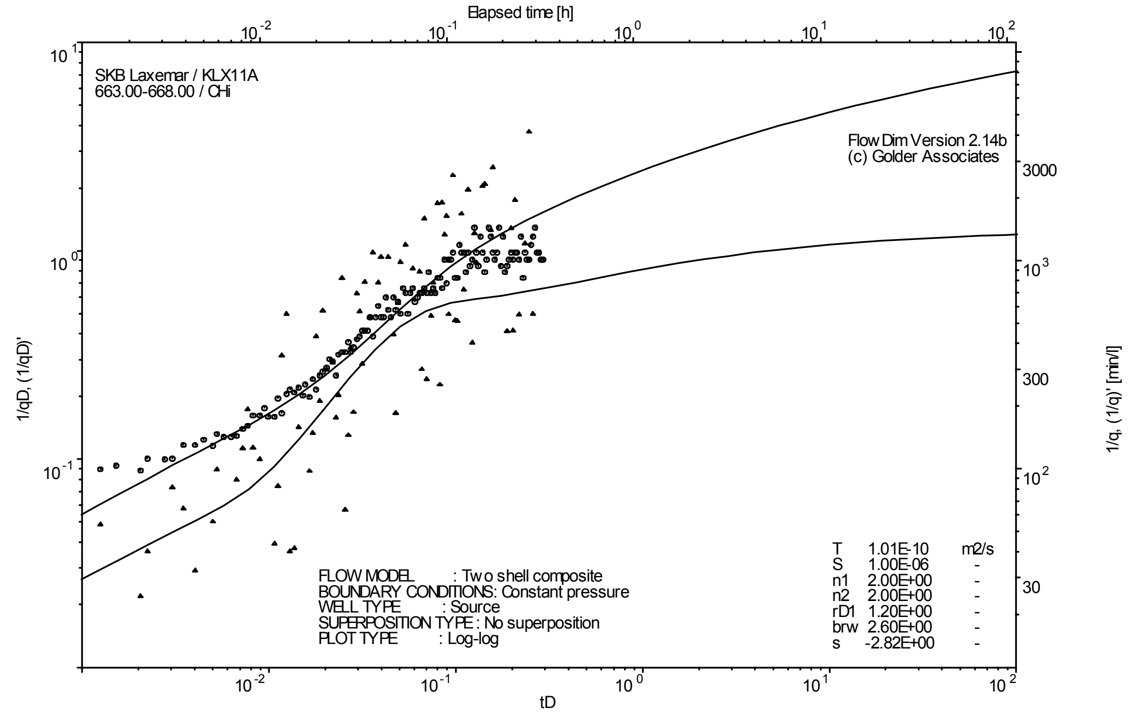
Analysis diagrams



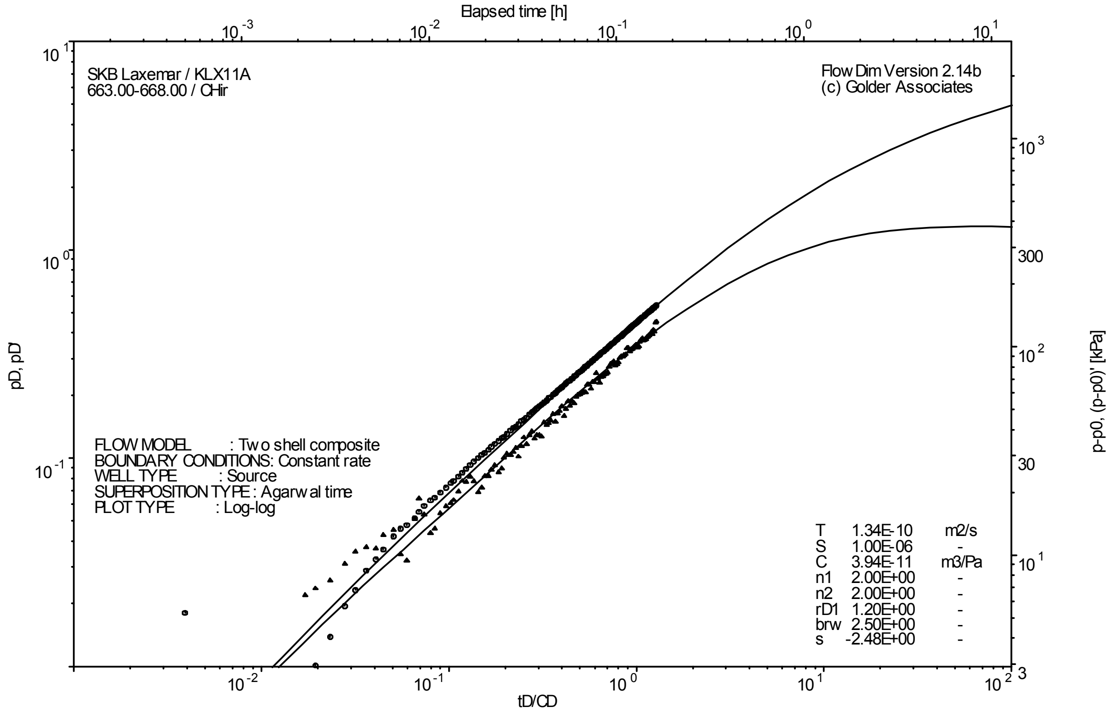
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

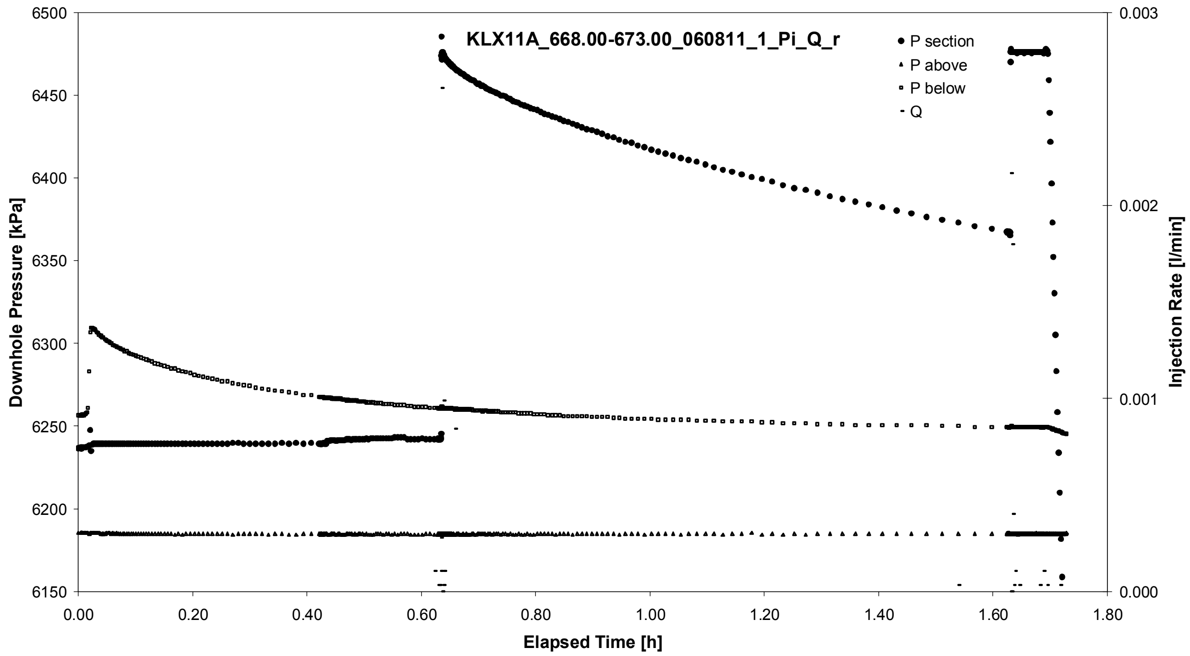
Not analysable

CHIR phase; HORNER match

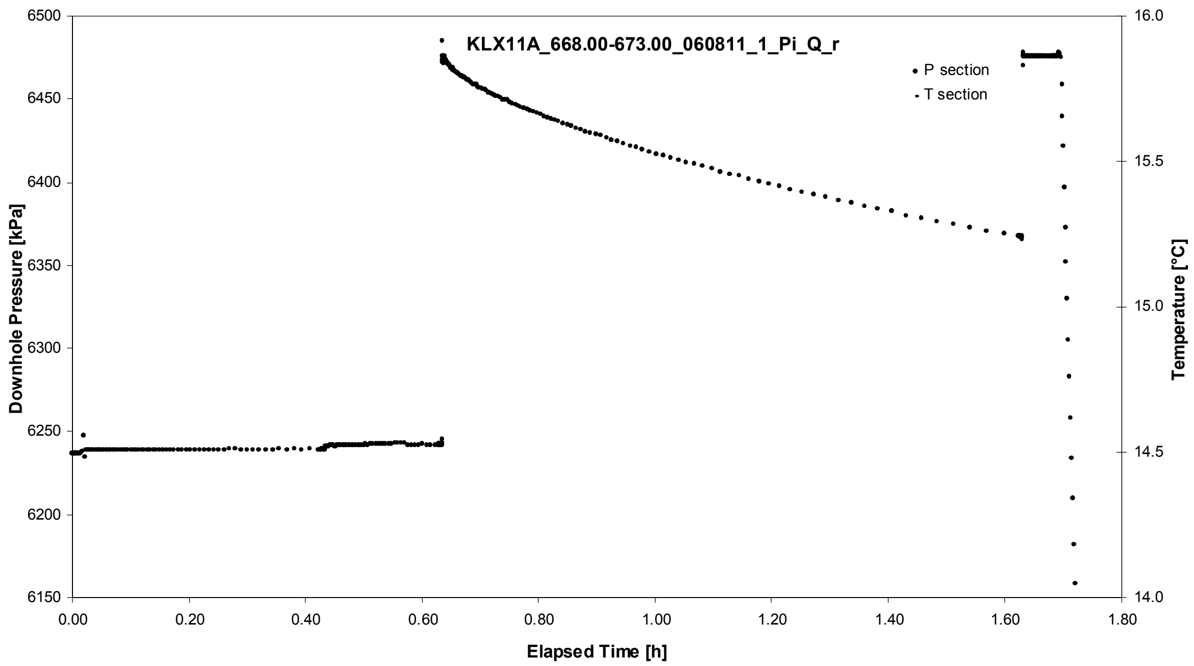
APPENDIX 2-91

Test 668.00 – 673.00 m

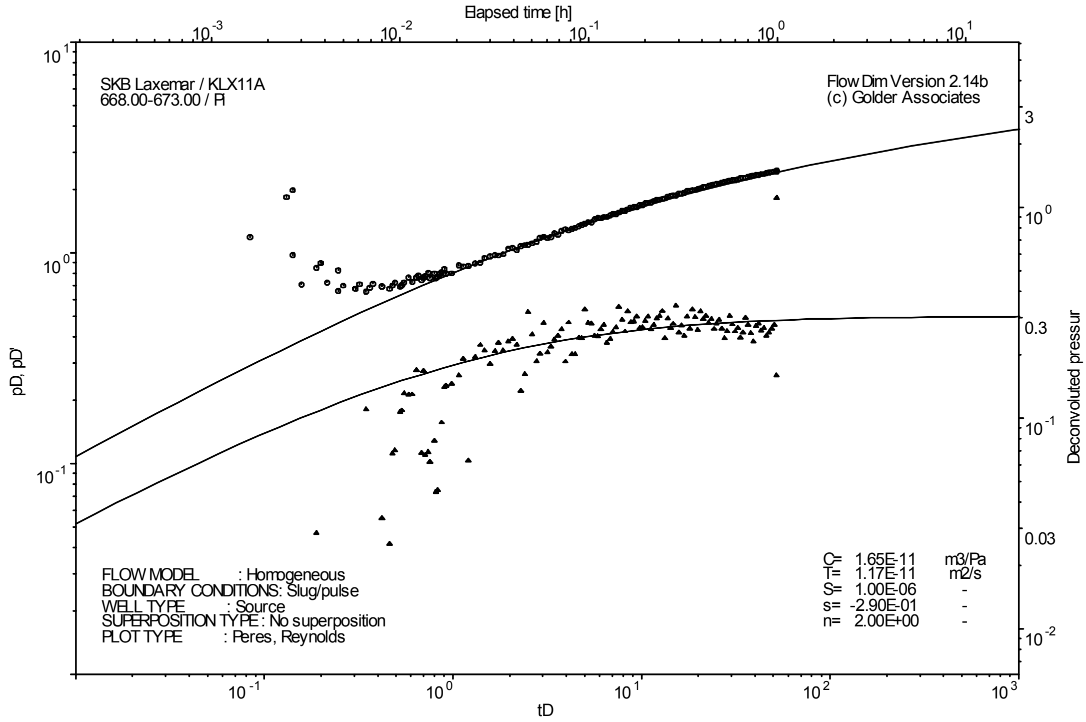
Analysis diagrams



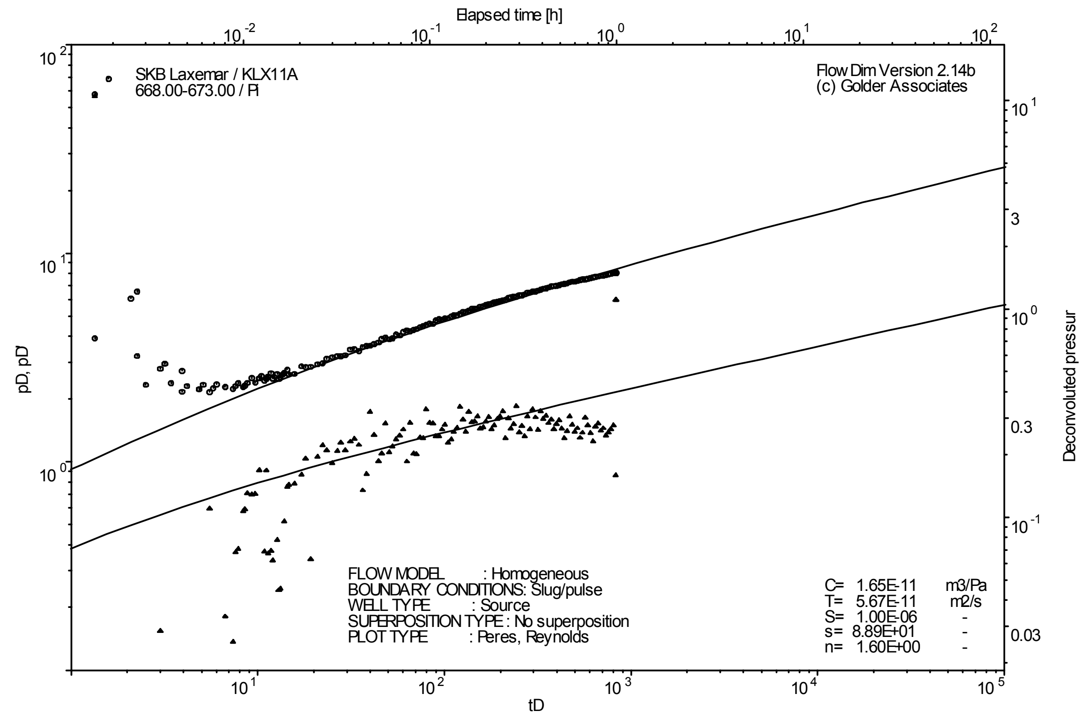
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



Pulse injection; deconvolution match

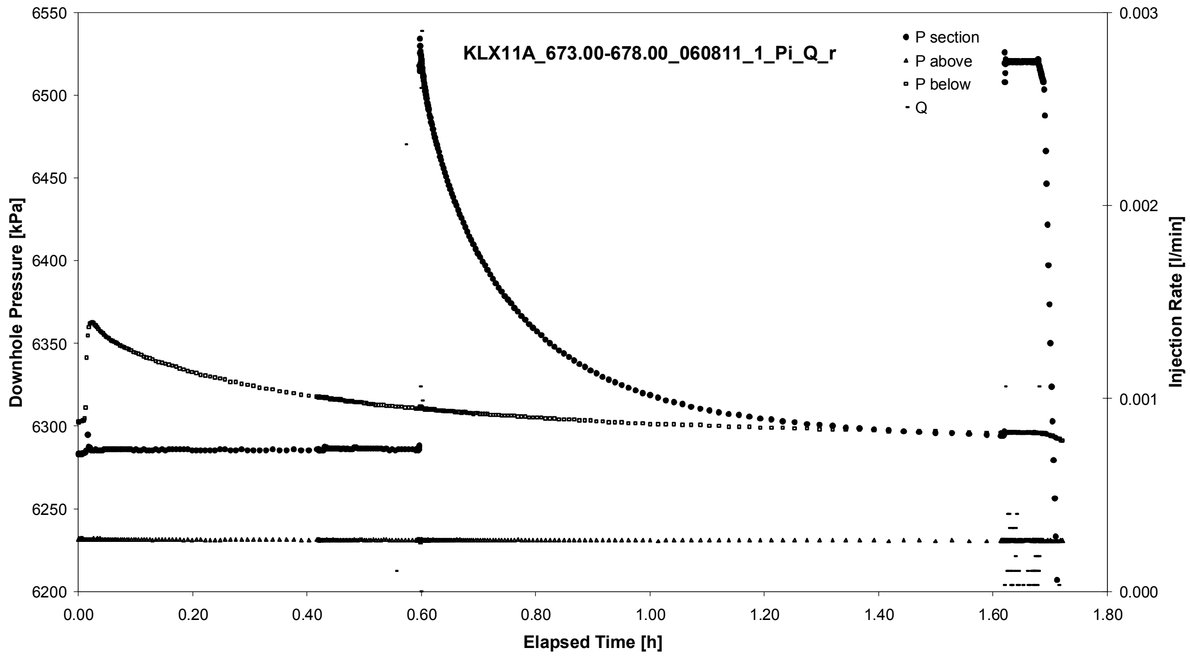


Pulse injection; deconvolution match (n=1.6)

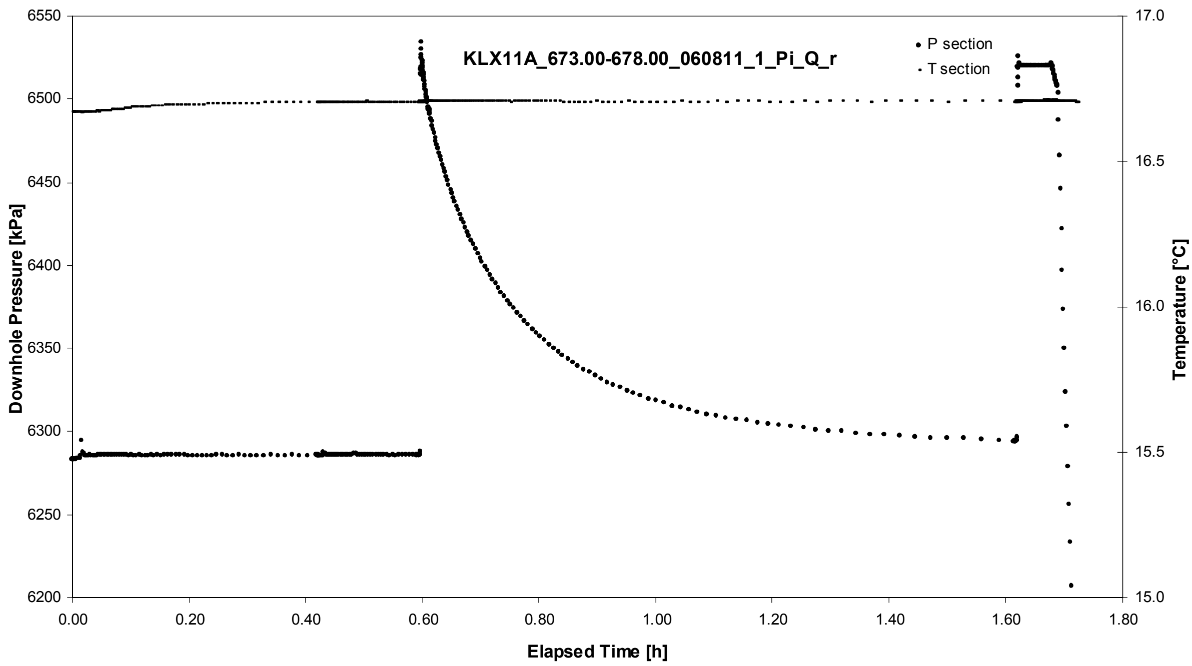
APPENDIX 2-92

Test 673.00 – 678.00 m

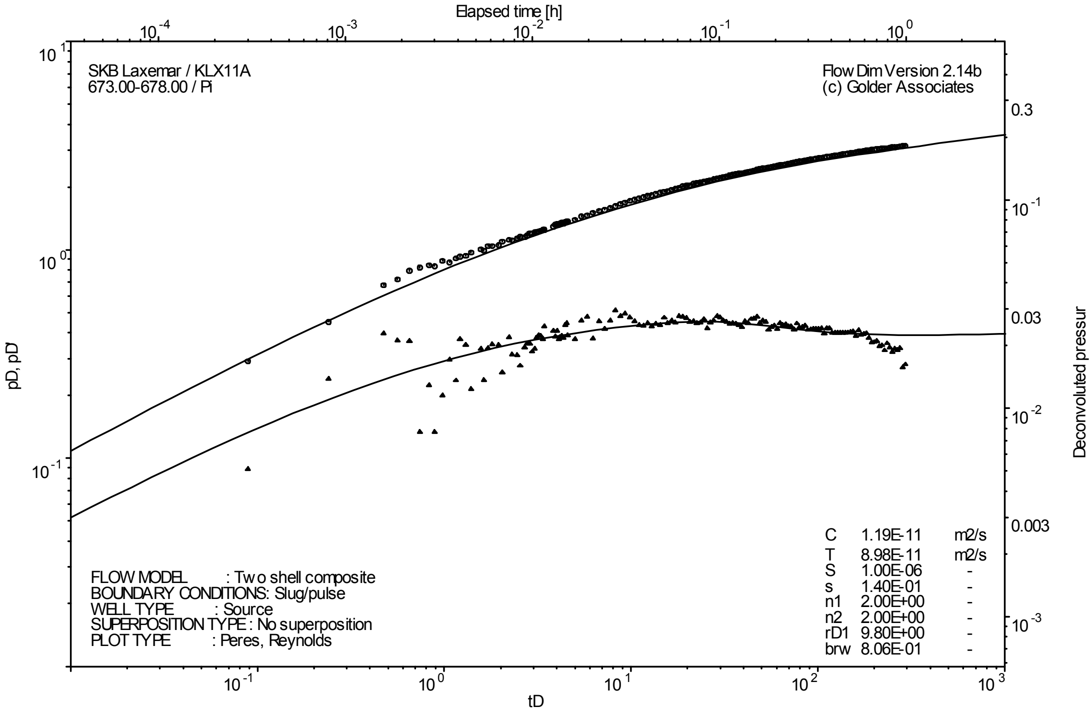
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

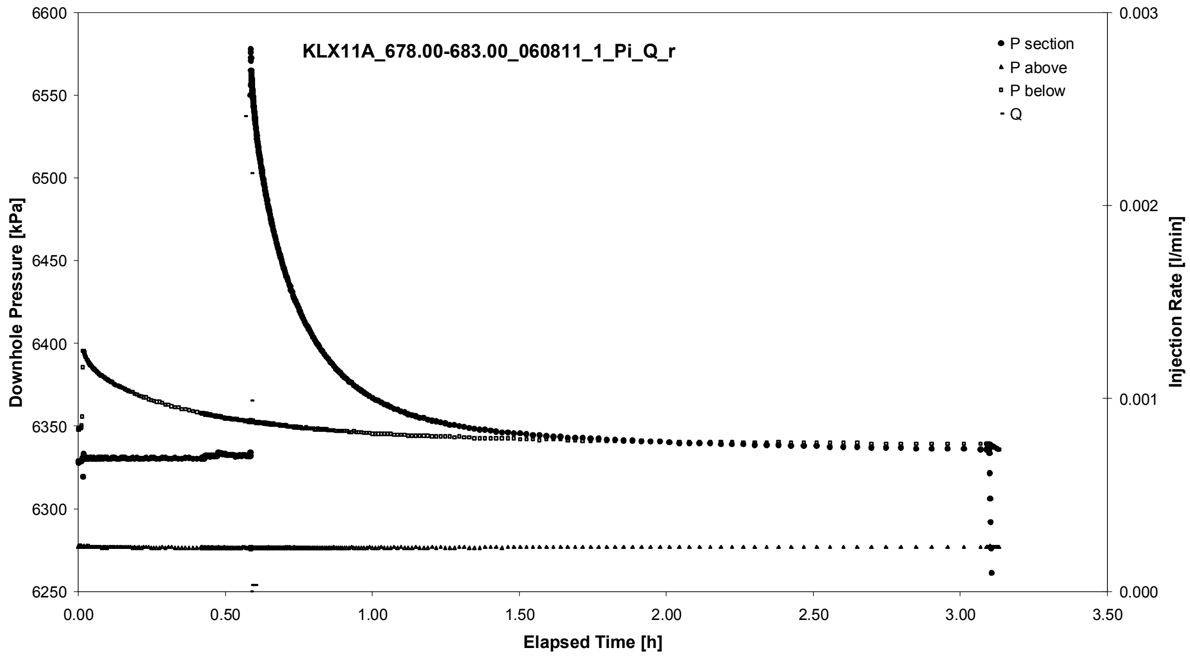


Pulse injection; deconvolution match

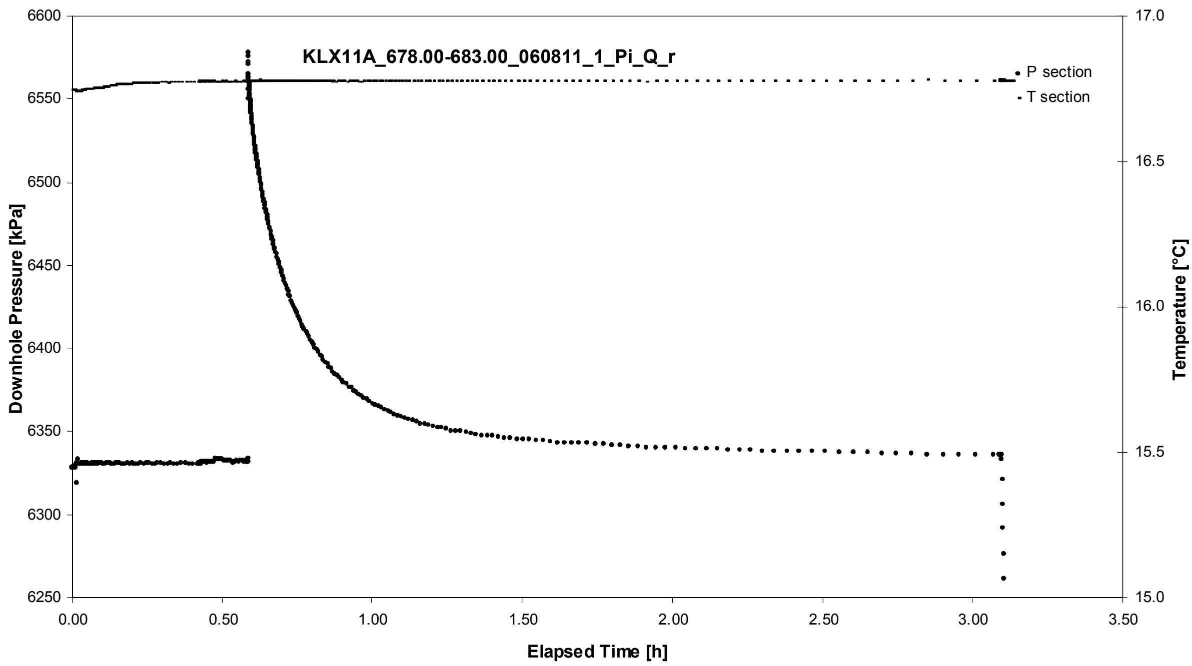
APPENDIX 2-93

Test 678.00 – 683.00 m

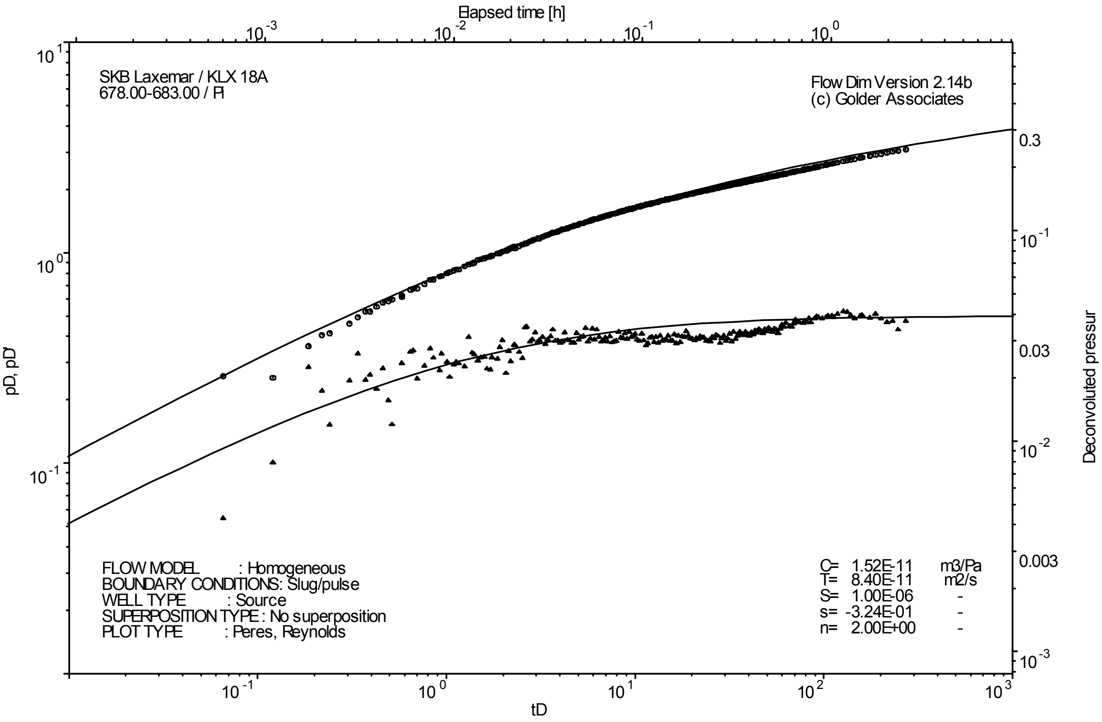
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



Pulse injection; deconvolution match

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KLX11A				
TEST- AND FILEPROTOCOL					Testorder dated : 2006-06-27				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
2006-06-29	14:32	103.00	203.00	__KLX11A_0103.00_200606291432.ht2	KLX11A_103.00-203.00_060629_1_CHir_Q_r.csv	Chir	2006-08-12	2006-06-29	
2006-06-29	18:03	203.00	303.00	__KLX11A_0203.00_200606291803.ht2	KLX11A_203.00-303.00_060629_1_CHir_Q_r.csv	Chir	2006-08-12	2006-06-29	
2006-06-30	09:15	303.00	403.00	__KLX11A_0303.00_200606300915.ht2	KLX11A_303.00-403.00_060630_1_CHir_Q_r.csv	Chir	2006-08-12	2006-06-30	
2006-06-30	13:11	403.00	503.00	__KLX11A_0403.00_200606301311.ht2	KLX11A_403.00-503.00_060630_1_CHir_Q_r.csv	Chir	2006-08-12	2006-06-30	
2006-07-01	08:47	503.00	603.00	__KLX11A_0503.00_200607010847.ht2	KLX11A_503.00-603.00_060701_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-01	
2006-07-01	12:14	603.00	703.00	__KLX11A_0603.00_200607011214.ht2	KLX11A_603.00-703.00_060701_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-01	
2006-07-01	17:09	703.00	803.00	__KLX11A_0703.00_200607011709.ht2	KLX11A_703.00-803.00_060701_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-02	
2006-07-02	09:11	803.00	903.00	__KLX11A_0803.00_200607020911.ht2	KLX11A_803.00-903.00_060702_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-02	
2006-07-02	14:45	876.00	976.00	__KLX11A_0876.00_200607021445.ht2	KLX11A_876.00-976.00_060702_1_Pi_Q_r.csv	Pi	2006-08-12	2006-07-02	
2006-07-04	08:19	103.00	123.00	__KLX11A_0103.00_200607040819.ht2	KLX11A_103.00-123.00_060704_1_CHir_Q_r.csv	CHir	2006-08-12	2006-07-04	
2006-07-04	10:31	123.00	143.00	__KLX11A_0123.00_200607041031.ht2	KLX11A_123.00-143.00_060704_1_CHir_Q_r.csv	CHir	2006-08-12	2006-07-04	
2006-07-04	12:49	143.00	163.00	__KLX11A_0143.00_200607041249.ht2	KLX11A_143.00-163.00_060704_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-04	
2006-07-04	15:05	163.00	183.00	__KLX11A_0163.00_200607041505.ht2	KLX11A_163.00-183.00_060704_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-04	
2006-07-04	17:12	183.00	203.00	__KLX11A_0183.00_200607041712.ht2	KLX11A_183.00-203.00_060704_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-04	
2006-07-04	18:50	203.00	223.00	__KLX11A_0203.00_200607041850.ht2	KLX11A_203.00-223.00_060704_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-05	
2006-07-05	08:38	223.00	243.00	__KLX11A_0223.00_200607050838.ht2	KLX11A_223.00-243.00_060705_1_Pi_Q_r.csv	Pi	2006-08-12	2006-07-05	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KLX11A				
TEST- AND FILEPROTOCOL					Testorder dated : 2006-06-27				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
2006-07-05	10:48	243.00	263.00	__KLX11A_0243.00_200607051048.ht2	KLX11A_243.00-263.00_060705_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-05	
2006-07-05	13:18	263.00	283.00	__KLX11A_0263.00_200607051318.ht2	KLX11A_263.00-283.00_060705_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-05	
2006-07-05	15:25	283.00	303.00	__KLX11A_0283.00_200607051525.ht2	KLX11A_283.00-303.00_060705_1_Pi_Q_r.csv	Pi	2006-08-12	2006-07-05	
2006-07-05	17:25	303.00	323.00	__KLX11A_0303.00_200607051725.ht2	KLX11A_303.00-323.00_060705_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-05	
2006-07-05	19:21	323.00	343.00	__KLX11A_0323.00_200607051921.ht2	KLX11A_323.00-343.00_060705_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-06	
2006-07-06	08:48	343.00	363.00	__KLX11A_0343.00_200607060848.ht2	KLX11A_343.00-363.00_060706_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-06	
2006-07-06	11:03	363.00	383.00	__KLX11A_0363.00_200607061103.ht2	KLX11A_363.00-383.00_060706_1_Pi_Q_r.csv	Pi	2006-08-12	2006-07-06	
2006-07-06	13:34	383.00	403.00	__KLX11A_0383.00_200607061334.ht2	KLX11A_383.00-403.00_060706_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-06	
2006-07-06	15:54	403.00	423.00	__KLX11A_0403.00_200607061554.ht2	KLX11A_403.00-423.00_060706_1_Pi_Q_r.csv	Pi	2006-08-12	2006-07-06	
2006-07-06	17:56	423.00	443.00	__KLX11A_0423.00_200607061756.ht2	KLX11A_423.00-443.00_060706_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-07	
2006-07-07	08:32	443.00	463.00	__KLX11A_0443.00_200607070832.ht2	KLX11A_443.00-463.00_060707_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-07	
2006-07-07	10:33	463.00	483.00	__KLX11A_0463.00_200607071033.ht2	KLX11A_463.00-483.00_060707_1_Pi_Q_r.csv	Pi	2006-08-12	2006-07-07	
2006-07-07	13:12	483.00	503.00	__KLX11A_0483.00_200607071312.ht2	KLX11A_483.00-503.00_060707_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-07	
2006-07-07	15:12	503.00	523.00	__KLX11A_0503.00_200607071512.ht2	KLX11A_503.00-523.00_060707_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-07	
2006-07-07	17:07	523.00	543.00	__KLX11A_0523.00_200607071707.ht2	KLX11A_523.00-543.00_060707_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-07	
2006-07-07	19:07	543.00	563.00	__KLX11A_0543.00_200607071907.ht2	KLX11A_543.00-563.00_060707_1_Pi_Q_r.csv	Pi	2006-08-12	2006-07-08	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KLX11A				
TEST- AND FILEPROTOCOL					Testorder dated : 2006-06-27				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
2006-07-08	08:58	563.00	583.00	__KLX11A_0563.00_200607080858.ht2	KLX11A_563.00-583.00_060708_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-08	
2006-07-08	10:53	583.00	603.00	__KLX11A_0583.00_200607081053.ht2	KLX11A_583.00-603.00_060708_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-08	
2006-07-08	13:17	603.00	623.00	__KLX11A_0603.00_200607081317.ht2	KLX11A_603.00-623.00_060708_1_Pi_Q_r.csv	Pi	2006-08-12	2006-07-08	
2006-07-08	15:12	623.00	643.00	__KLX11A_0623.00_200607081512.ht2	KLX11A_623.00-643.00_060708_1_Pi_Q_r.csv	Pi	2006-08-12	2006-07-08	
2006-07-08	17:10	643.00	663.00	__KLX11A_0643.00_200607081710.ht2	KLX11A_643.00-663.00_060708_1_Pi_Q_r.csv	Pi	2006-08-12	2006-07-08	
2006-07-08	19:06	663.00	683.00	__KLX11A_0663.00_200607081906.ht2	KLX11A_663.00-683.00_060708_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-09	
2006-07-09	09:11	683.00	703.00	__KLX11A_0683.00_200607090911.ht2	KLX11A_683.00-703.00_060709_1_Pi_Q_r.csv	Pi	2006-08-12	2006-07-09	
2006-07-09	11:08	703.00	723.00	__KLX11A_0703.00_200607091108.ht2	KLX11A_703.00-723.00_060709_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-09	
2006-07-09	13:58	723.00	743.00	__KLX11A_0723.00_200607091358.ht2	KLX11A_723.00-743.00_060709_1_Pi_Q_r.csv	Pi	2006-08-12	2006-07-09	
2006-07-09	15:45	743.00	763.00	__KLX11A_0743.00_200607091545.ht2	KLX11A_743.00-763.00_060709_1_Pi_Q_r.csv	Pi	2006-08-12	2006-07-09	
2006-07-09	17:25	763.00	783.00	__KLX11A_0763.00_200607091725.ht2	KLX11A_763.00-783.00_060709_1_Pi_Q_r.csv	Pi	2006-08-12	2006-07-09	
2006-07-09	18:43	783.00	803.00	__KLX11A_0783.00_200607091843.ht2	KLX11A_783.00-803.00_060709_1_Pi_Q_r.csv	Pi	2006-08-12	2006-07-10	
2006-07-10	08:19	803.00	823.00	__KLX11A_0803.00_200607100819.ht2	KLX11A_803.00-823.00_060710_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-10	
2006-07-10	09:45	823.00	843.00	__KLX11A_0823.00_200607100945.ht2	KLX11A_823.00-843.00_060710_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-10	
2006-07-10	11:10	843.00	863.00	__KLX11A_0843.00_200607101110.ht2	KLX11A_843.00-863.00_060710_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-10	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KLX11A				
TEST- AND FILEPROTOCOL					Testorder dated : 2006-06-27				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
2006-07-10	14:04	863.00	883.00	__KLX11A_0863.00_200607101404.ht2	KLX11A_863.00-883.00_060710_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-10	
2006-07-12	07:38	303.00	308.00	__KLX11A_0303.00_200607120738.ht2	KLX11A_303.00-308.00_060712_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-12	
2006-07-12	09:30	308.00	313.00	__KLX11A_0308.00_200607120930.ht2	KLX11A_308.00-313.00_060712_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-12	
2006-07-12	11:13	313.00	318.00	__KLX11A_0313.00_200607121113.ht2	KLX11A_313.00-318.00_060712_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-12	
2006-07-12	13:09	318.00	323.00	__KLX11A_0318.00_200607121309.ht2	KLX11A_318.00-323.00_060712_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-12	
2006-07-12	14:31	343.00	348.00	__KLX11A_0343.00_200607121431.ht2	KLX11A_343.00-348.00_060712_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-12	
2006-07-12	16:38	348.00	353.00	__KLX11A_0348.00_200607121638.ht2	KLX11A_348.00-353.00_060712_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-12	
2006-07-12	17:56	353.00	358.00	__KLX11A_0353.00_200607121756.ht2	KLX11A_353.00-358.00_060712_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-13	
2006-07-13	07:52	358.00	363.00	__KLX11A_0358.00_200607130752.ht2	KLX11A_358.00-363.00_060713_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-13	
2006-07-13	09:14	383.00	388.00	__KLX11A_0383.00_200607130914.ht2	KLX11A_383.00-388.00_060713_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-13	
2006-07-13	10:28	388.00	393.00	__KLX11A_0388.00_200607131028.ht2	KLX11A_388.00-393.00_060713_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-13	
2006-07-13	12:29	393.00	398.00	__KLX11A_0393.00_200607131229.ht2	KLX11A_393.00-398.00_060713_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-13	
2006-07-13	13:44	398.00	403.00	__KLX11A_0398.00_200607131344.ht2	KLX11A_398.00-403.00_060713_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-13	
2006-07-13	15:46	423.00	428.00	__KLX11A_0423.00_200607131546.ht2	KLX11A_423.00-428.00_060713_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-13	
2006-07-13	16:59	428.00	433.00	__KLX11A_0428.00_200607131659.ht2	KLX11A_428.00-433.00_060713_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-14	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KLX11A				
TEST- AND FILEPROTOCOL					**Testorder dated : 2006-06-27**				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
2006-07-14	07:58	433.00	438.00	__KLX11A_0433.00_200607140758.ht2	KLX11A_433.00-438.00_060714_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-14	
2006-07-14	09:17	438.00	443.00	__KLX11A_0438.00_200607140917.ht2	KLX11A_438.00-443.00_060714_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-14	
2006-07-14	11:06	442.00	447.00	__KLX11A_0442.00_200607141106.ht2	KLX11A_442.00-447.00_060714_1_Pi_Q_r.csv	Pi	2006-08-12	2006-07-14	
2006-07-14	13:16	447.00	452.00	__KLX11A_0447.00_200607141316.ht2	KLX11A_447.00-452.00_060714_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-14	
2006-07-14	15:01	452.00	457.00	__KLX11A_0452.00_200607141501.ht2	KLX11A_452.00-457.00_060714_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-14	
2006-07-14	16:45	457.00	462.00	__KLX11A_0457.00_200607141645.ht2	KLX11A_457.00-462.00_060714_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-14	
2006-07-14	18:01	462.00	467.00	__KLX11A_0462.00_200607141801.ht2	KLX11A_462.00-467.00_060714_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-15	
2006-07-15	08:16	483.00	488.00	__KLX11A_0483.00_200607150816.ht2	KLX11A_483.00-488.00_060715_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-15	
2006-07-15	09:29	488.00	493.00	__KLX11A_0488.00_200607150929.ht2	KLX11A_488.00-493.00_060715_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-15	
2006-07-15	10:47	493.00	498.00	__KLX11A_0493.00_200607151047.ht2	KLX11A_493.00-498.00_060715_1_Pi_Q_r.csv	Pi	2006-08-12	2006-07-15	
2006-07-15	14:04	498.00	503.00	__KLX11A_0498.00_200607151404.ht2	KLX11A_498.00-503.00_060715_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-15	
2006-07-15	15:53	503.00	508.00	__KLX11A_0503.00_200607151553.ht2	KLX11A_503.00-508.00_060715_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-15	
2006-07-15	18:09	508.00	513.00	__KLX11A_0508.00_200607151809.ht2	KLX11A_508.00-513.00_060715_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-16	
2006-07-16	08:05	513.00	518.00	__KLX11A_0513.00_200607160805.ht2	KLX11A_513.00-518.00_060716_1_CHir_Q_r.csv	Chir	2006-08-12	2006-07-16	
2006-08-07	09:04	513.00	518.00	__KLX11A_0513.00_200608070904.ht2	KLX11A_513.00-518.00_060807_2_CHir_Q_r.csv	Chir	2006-08-12	2006-08-07	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KLX11A				
TEST- AND FILEPROTOCOL					**Testorder dated : 2006-06-27**				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
2006-08-08	15:30	513.00	518.00	__KLX11A_0513.00_200608081530.ht2	KLX11A_513.00-518.00_060808_3_CHir_Q_r.csv	Chir	2006-08-12	2006-08-08	
2006-08-08	17:47	518.00	523.00	__KLX11A_0518.00_200608081747.ht2	KLX11A_518.00-523.00_060808_1_CHir_Q_r.csv	Chir	2006-08-12	2006-08-09	
2006-08-09	08:08	523.00	528.00	__KLX11A_0523.00_200608090808.ht2	KLX11A_523.00-528.00_060809_1_CHir_Q_r.csv	Chir	2006-08-12	2006-08-09	
2006-08-09	10:08	528.00	533.00	__KLX11A_0528.00_200608091008.ht2	KLX11A_528.00-533.00_060809_1_CHir_Q_r.csv	Chir	2006-08-12	2006-08-09	
2006-08-09	12:48	533.00	538.00	__KLX11A_0533.00_200608091248.ht2	KLX11A_533.00-538.00_060809_1_CHir_Q_r.csv	Chir	2006-08-12	2006-08-09	
2006-08-09	14:40	538.00	543.00	__KLX11A_0538.00_200608091440.ht2	KLX11A_538.00-543.00_060809_1_CHir_Q_r.csv	Chir	2006-08-12	2006-08-09	
2006-08-09	16:59	563.00	568.00	__KLX11A_0563.00_200608091659.ht2	KLX11A_563.00-568.00_060809_1_CHir_Q_r.csv	Chir	2006-08-12	2006-08-09	
2006-08-09	18:17	568.00	573.00	__KLX11A_0568.00_200608091817.ht2	KLX11A_568.00-573.00_060809_1_CHir_Q_r.csv	Chir	2006-08-12	2006-08-10	
2006-08-10	08:06	573.00	578.00	__KLX11A_0573.00_200608100806.ht2	KLX11A_573.00-578.00_060810_1_CHir_Q_r.csv	Chir	2006-08-12	2006-08-10	
2006-08-10	10:02	578.00	583.00	__KLX11A_0578.00_200608101002.ht2	KLX11A_578.00-583.00_060810_1_CHir_Q_r.csv	Chir	2006-08-12	2006-08-10	
2006-08-10	12:20	583.00	588.00	__KLX11A_0583.00_200608101220.ht2	KLX11A_583.00-588.00_060810_1_Pi_Q_r.csv	Pi	2006-08-12	2006-08-10	
2006-08-10	14:41	588.00	593.00	__KLX11A_0588.00_200608101441.ht2	KLX11A_588.00-593.00_060810_1_Pi_Q_r.csv	Pi	2006-08-12	2006-08-10	
2006-08-10	16:33	593.00	598.00	__KLX11A_0593.00_200608101633.ht2	KLX11A_593.00-598.00_060810_1_Pi_Q_r.csv	Pi	2006-08-12	2006-08-11	
2006-08-11	08:01	598.00	603.00	__KLX11A_0598.00_200608110801.ht2	KLX11A_598.00-603.00_060811_1_CHir_Q_r.csv	Chir	2006-08-12	2006-08-11	
2006-08-11	10:29	663.00	668.00	__KLX11A_0663.00_200608111029.ht2	KLX11A_663.00-668.00_060811_1_CHir_Q_r.csv	Chir	2006-08-12	2006-08-11	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KLX11A				
TEST- AND FILEPROTOCOL					**Testorder dated : 2006-06-27**				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
2006-08-11	13:30	668.00	673.00	__KLX11A_0668.00_200608111330.ht2	KLX11A_668.00-673.00_060811_1_Pi_Q_r.csv	Pi	2006-08-12	2006-08-11	
2006-08-11	15:38	673.00	678.00	__KLX11A_0673.00_200608111538.ht2	KLX11A_673.00-678.00_060811_1_Pi_Q_r.csv	Pi	2006-08-12	2006-08-11	
2006-08-11	17:45	678.00	683.00	__KLX11A_0678.00_200608111745.ht2	KLX11A_678.00-683.00_060811_1_Pi_Q_r.csv	Pi	2006-08-12	2006-08-12	

APPENDIX 5

SICADA data tables

(Simplified version v1.4)

SICADA/Data Import Template

File Identity	
Created By	Stephan Rohs
Created	2006-09-11

Compiled By	
Quality Check For Delivery	
Delivery Approval	

Activity Type	KLX 11A KLX 11A - Injection test

Project	AP PS 400-06-072

Activity Information						**Additional Activity Data**				
						C10	P20	P200	P220	R25
Idcode	**Start Date**	**Stop Date**	**Secup (m)**	**Seclow (m)**	**Section No**	**Company**	**Field crew manager**	**Field crew**	**evaluating data**	**Report**
KLX 11A	2006-06-29 14:32	2006-07-16 10:33	103.00	976.00		Golder Associates	Stephan Rohs	Stephan Rohs, Philipp Wolf	Stephan Rohs, Philipp Wolf	Stephan Rohs, Philipp Wolf
KLX 11A	2006.08.08 15:30	2006.08.11 20:53	513.00	683.00		Golder Associates	Reinder van der Wall	Reinder van der Wall, Philipp Wolf	Stephan Rohs, Philipp Wolf	Stephan Rohs, Philipp Wolf

Table	plu_s_hole_test_d PLU Injection and pumping, General information		
Column	**Datatype**	**Unit**	**Column Description**
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__u	FLOAT	m**3/s	Estimated upper measurement limit of flow rate
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_h	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_p	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

idcode	start_date	stop_date	secup	seclow	section_ no	test_type	formation_ type	start_flow_period	stop_flow_period	flow_rate_end_ qp	value_type_ qp	mean_flow_ rate_qm	q_measl__l	q_measl__u	tot_volume_vp
KLX 11A	060629 14:32:00	060629 16:40:00	103.00	203.00		3	1	2006-06-29 15:38:42	2006-06-29 16:08:52	1.31E-04	0	1.37E-04	1.67E-08	8.33E-04	2.46E-01
KLX 11A	060629 18:03:00	060629 20:21:00	203.00	303.00		3	1	2006-06-29 19:18:52	2006-06-29 19:49:02	1.52E-04	0	1.53E-04	1.67E-08	8.33E-04	2.76E-01
KLX 11A	060630 09:15:00	060630 11:12:00	303.00	403.00		3	1	2006-06-30 10:10:28	2006-06-30 10:40:38	5.67E-05	0	5.83E-05	1.67E-08	8.33E-04	1.05E-01
KLX 11A	060630 13:11:00	060630 15:20:00	403.00	503.00		3	1	2006-06-30 14:18:35	2006-06-30 14:48:45	1.17E-06	0	1.33E-06	1.67E-08	8.33E-04	2.40E-03
KLX 11A	060701 08:47:00	060701 10:50:00	503.00	603.00		3	1	2006-07-01 09:48:22	2006-07-01 10:18:32	1.91E-04	0	1.98E-04	1.67E-08	8.33E-04	3.57E-01
KLX 11A	060701 12:14:00	060701 15:43:00	603.00	703.00		3	1	2006-07-01 14:11:12	2006-07-01 14:41:22	3.33E-08	0	5.00E-08	1.67E-08	8.33E-04	9.00E-05
KLX 11A	060701 17:09:00	060702 01:32:00	703.00	803.00		3	1	2006-07-01 19:00:34	2006-07-01 19:30:44	3.33E-08	0	6.67E-08	1.67E-08	8.33E-04	1.20E-04
KLX 11A	060702 09:11:00	060702 13:33:00	803.00	903.00		3	1	2006-07-02 11:01:14	2006-07-02 11:31:24	6.67E-08	0	1.00E-07	1.67E-08	8.33E-04	1.80E-04
KLX 11A	060702 14:45:00	060702 16:49:00	876.00	976.00		3	1	2006-07-02 15:33:25	2006-07-02 15:33:35	#NV	0	#NV	1.67E-08	8.33E-04	5.60E-06
KLX 11A	060704 08:19:00	060704 09:46:00	103.00	123.00		3	1	2006-07-04 09:04:05	2006-07-04 09:24:15	2.33E-05	0	2.33E-05	1.67E-08	8.33E-04	2.80E-02
KLX 11A	060704 10:31:00	060704 11:54:00	123.00	143.00		3	1	2006-07-04 11:12:38	2006-07-04 11:32:48	6.50E-05	0	6.67E-05	1.67E-08	8.33E-04	8.00E-02
KLX 11A	060704 12:49:00	060704 14:32:00	143.00	163.00		3	1	2006-07-04 13:40:34	2006-07-04 14:00:44	6.67E-06	0	8.33E-06	1.67E-08	8.33E-04	1.00E-02
KLX 11A	060704 15:05:00	060704 16:33:00	163.00	183.00		3	1	2006-07-04 15:51:48	2006-07-04 16:11:58	4.17E-05	0	4.33E-05	1.67E-08	8.33E-04	5.20E-02
KLX 11A	060704 17:12:00	060704 18:14:00	183.00	203.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060704 18:50:00	060704 19:46:00	203.00	223.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060705 08:38:00	060705 10:07:00	223.00	243.00		3	1	2006-07-05 09:20:29	2006-07-05 09:20:39	#NV	0	#NV	1.67E-08	8.33E-04	1.32E-05
KLX 11A	060705 10:48:00	060705 12:22:00	243.00	263.00		3	1	2006-07-05 11:40:25	2006-07-05 12:00:35	6.67E-07	0	7.00E-07	1.67E-08	8.33E-04	8.40E-04
KLX 11A	060705 13:18:00	060705 14:44:00	263.00	283.00		3	1	2006-07-05 14:02:11	2006-07-05 14:22:21	1.65E-04	0	1.69E-04	1.67E-08	8.33E-04	2.03E-01
KLX 11A	060705 15:25:00	060705 16:51:00	283.00	303.00		3	1	2006-07-05 16:04:29	2006-07-05 16:04:39	#NV	0	#NV	1.67E-08	8.33E-04	1.33E-05
KLX 11A	060705 17:25:00	060705 18:49:00	303.00	323.00		3	1	2006-07-05 18:07:26	2006-07-05 18:27:36	6.50E-05	0	6.83E-05	1.67E-08	8.33E-04	8.20E-02
KLX 11A	060705 19:21:00	060706 00:42:00	323.00	343.00		3	1	2006-07-05 20:29:02	2006-07-05 20:40:12	8.33E-09	0	5.00E-09	1.67E-08	8.33E-04	3.30E-06
KLX 11A	060706 08:48:00	060706 10:30:00	343.00	363.00		3	1	2006-07-06 09:48:23	2006-07-06 10:08:33	1.50E-07	0	3.00E-07	1.67E-08	8.33E-04	3.60E-04
KLX 11A	060706 11:03:00	060706 12:55:00	363.00	383.00		3	1	2006-07-06 11:41:39	2006-07-06 11:41:49	#NV	0	#NV	1.67E-08	8.33E-04	7.80E-06
KLX 11A	060706 13:34:00	060706 15:02:00	383.00	403.00		3	1	2006-07-06 14:40:27	2006-07-06 15:00:37	8.33E-08	0	8.33E-08	1.67E-08	8.33E-04	1.00E-04
KLX 11A	060706 15:54:00	060706 17:22:00	403.00	423.00		3	1	2006-07-06 16:35:13	2006-07-06 16:35:23	#NV	0	#NV	1.67E-08	8.33E-04	2.20E-06
KLX 11A	060706 17:56:00	060706 19:21:00	423.00	443.00		3	1	2006-07-06 18:39:37	2006-07-06 18:59:47	1.00E-06	0	1.00E-06	1.67E-08	8.33E-04	1.20E-03
KLX 11A	060707 08:32:00	060707 10:01:00	443.00	463.00		3	1	2006-07-07 09:19:26	2006-07-07 09:39:36	5.00E-07	0	4.92E-07	1.67E-08	8.33E-04	5.90E-04
KLX 11A	060707 10:33:00	060707 12:34:00	463.00	483.00		3	1	2006-07-07 11:12:30	2006-07-07 11:12:40	#NV	0	#NV	1.67E-08	8.33E-04	1.33E-05
KLX 11A	060707 13:12:00	060707 14:44:00	483.00	503.00		3	1	2006-07-07 14:01:52	2006-07-07 14:22:02	1.17E-07	0	1.33E-07	1.67E-08	8.33E-04	1.60E-04
KLX 11A	060707 15:12:00	060707 16:39:00	503.00	523.00		3	1	2006-07-07 15:57:20	2006-07-07 16:17:30	5.83E-05	0	6.17E-05	1.67E-08	8.33E-04	7.40E-02
KLX 11A	060707 17:07:00	060707 18:30:00	523.00	543.00		3	1	2006-07-07 17:48:44	2006-07-07 18:08:54	1.33E-06	0	1.33E-06	1.67E-08	8.33E-04	1.60E-03
KLX 11A	060707 19:07:00	060708 08:26:00	543.00	563.00		3	1	2006-07-07 19:44:15	2006-07-07 19:44:25	#NV	0	#NV	1.67E-08	8.33E-04	2.40E-06
KLX 11A	060708 08:58:00	060708 10:21:00	563.00	583.00		3	1	2006-07-08 09:39:14	2006-07-08 09:59:24	1.47E-04	0	1.52E-04	1.67E-08	8.33E-04	1.82E-01
KLX 11A	060708 10:53:00	060708 12:23:00	583.00	603.00		3	1	2006-07-08 11:41:17	2006-07-08 12:01:27	4.33E-06	0	4.50E-06	1.67E-08	8.33E-04	5.40E-03
KLX 11A	060708 13:17:00	060708 14:41:00	603.00	623.00		3	1	2006-07-08 13:55:12	2006-07-08 13:55:22	#NV	0	#NV	1.67E-08	8.33E-04	1.33E-05
KLX 11A	060708 15:12:00	060708 16:39:00	623.00	643.00		3	1	2006-07-08 15:52:56	2006-07-08 15:53:06	#NV	0	#NV	1.67E-08	8.33E-04	1.31E-05
KLX 11A	060708 17:11:00	060708 18:34:00	643.00	663.00		3	1	2006-07-08 17:48:39	2006-07-08 17:48:49	#NV	0	#NV	1.67E-08	8.33E-04	6.76E-06
KLX 11A	060708 19:06:00	060709 08:39:00	663.00	683.00		3	1	2006-07-09 07:57:45	2006-07-09 08:17:55	1.67E-08	0	3.67E-08	1.67E-08	8.33E-04	4.40E-05
KLX 11A	060709 09:11:00	060709 10:40:00	683.00	703.00		3	1	2006-07-09 09:50:31	2006-07-09 10:32:52	#NV	0	#NV	1.67E-08	8.33E-04	1.19E-05
KLX 11A	060709 11:08:00	060709 13:27:00	703.00	723.00		3	1	2006-07-09 12:25:20	2006-07-09 12:45:30	5.00E-08	0	8.47E-08	1.67E-08	8.33E-04	1.02E-04
KLX 11A	060709 13:58:00	060709 15:13:00	723.00	743.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060709 15:45:00	060709 16:56:00	743.00	763.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060709 17:25:00	060709 18:10:00	763.00	783.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060709 18:43:00	060709 20:01:00	783.00	803.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060710 08:19:00	060710 09:15:00	803.00	823.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060710 09:45:00	060710 10:37:00	823.00	843.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060710 11:10:00	060710 13:24:00	843.00	863.00		3	1	2006-07-10 12:52:06	2006-07-10 13:02:16	6.67E-08	0	1.05E-07	1.67E-08	8.33E-04	1.26E-04
KLX 11A	060710 14:04:00	060710 14:56:00	863.00	883.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060712 07:38:00	060712 09:06:00	303.00	308.00		3	1	2006-07-12 08:24:00	2006-07-12 08:24:10	1.06E-05	0	1.16E-05	1.67E-08	8.33E-04	1.39E-02

idcode	secup	seclow	dur_flow_phase_tp	dur_rec_phase_tf	initial_head_hi	head_at_flow_end_hp	final_head_hf	initial_press_pi	press_at_flow_end_pp	final_press_pf	fluid_temp_tew	fluid_elcond_ecw	fluid_salinity_tdsw	fluid_salinity_tdswm	reference	comments	lp
KLX 11A	103.00	203.00	1800	1800			11.45	1837	2035	1840	9.6						153.00
KLX 11A	203.00	303.00	1800	1800			10.70	2776	2975	2777	11.1						253.00
KLX 11A	303.00	403.00	1800	1800			10.58	3712	3907	3713	12.6						353.00
KLX 11A	403.00	503.00	1800	1800			12.21	4650	4854	4650	14.0						453.00
KLX 11A	503.00	603.00	1800	1800			12.66	5580	5795	5600	15.6						553.00
KLX 11A	603.00	703.00	1800	3600			14.05	6549	6754	6586	17.1						653.00
KLX 11A	703.00	803.00	1800	21600			14.06	7477	7680	7451	18.6						753.00
KLX 11A	803.00	903.00	1800	7200			13.37	8354	8589	8352	20.1						853.00
KLX 11A	876.00	976.00	10	3978			#NV	9042	9253	9202	21.2						926.00
KLX 11A	103.00	123.00	1200	1200			10.46	1093	1293	1093	8.4						113.00
KLX 11A	123.00	143.00	1200	1200			9.97	1275	1475	1275	8.7						133.00
KLX 11A	143.00	163.00	1200	1800			8.03	1464	1671	1469	8.9						153.00
KLX 11A	163.00	183.00	1200	1200			10.02	1648	1849	1651	9.2						173.00
KLX 11A	183.00	203.00	#NV	#NV			#NV	#NV	#NV	#NV	9.5						193.00
KLX 11A	203.00	223.00	#NV	#NV			#NV	#NV	#NV	#NV	9.8						213.00
KLX 11A	223.00	243.00	10	2700			#NV	2233	2458	2255	10.0						233.00
KLX 11A	243.00	263.00	1200	1200			10.42	2403	2616	2402	10.4						253.00
KLX 11A	263.00	283.00	1200	1200			10.58	2588	2789	2590	10.8						273.00
KLX 11A	283.00	303.00	10	2700			#NV	2797	3034	2958	11.1						293.00
KLX 11A	303.00	323.00	1200	1200			10.24	2963	3187	2964	11.5						313.00
KLX 11A	323.00	343.00	660	14400			9.51	3159	3377	3155	11.8						333.00
KLX 11A	343.00	363.00	1200	1200			#NV	3356	3551	3443	12.1						353.00
KLX 11A	363.00	383.00	10	3960			#NV	3536	3753	3693	12.3						373.00
KLX 11A	383.00	403.00	1200	1200			10.04	3715	3954	3712	12.6						393.00
KLX 11A	403.00	423.00	10	2460			#NV	3908	4141	4062	12.9						413.00
KLX 11A	423.00	443.00	1200	1200			11.59	4088	4290	4087	13.2						433.00
KLX 11A	443.00	463.00	1200	1200			11.35	4269	4513	4269	13.5						453.00
KLX 11A	463.00	483.00	10	4500			#NV	4485	4698	4572	13.8						473.00
KLX 11A	483.00	503.00	1200	1200			11.84	4649	4899	4642	14.0						493.00
KLX 11A	503.00	523.00	1200	1200			11.80	4837	5037	4838	14.4						513.00
KLX 11A	523.00	543.00	1200	1200			12.57	5024	5228	5023	14.6						533.00
KLX 11A	543.00	563.00	10	45360			#NV	5219	5439	5349	15.0						553.00
KLX 11A	563.00	583.00	1200	1200			12.47	5392	5590	5394	15.1						573.00
KLX 11A	583.00	603.00	1200	1200			12.91	5585	5786	5590	15.6						593.00
KLX 11A	603.00	623.00	10	2460			#NV	5778	6021	5930	15.9						613.00
KLX 11A	623.00	643.00	10	2460			#NV	5963	6183	6172	16.2						633.00
KLX 11A	643.00	663.00	10	2400			#NV	6153	6368	6133	16.5						653.00
KLX 11A	663.00	683.00	1200	1200			12.80	6327	6583	6411	16.8						673.00
KLX 11A	683.00	703.00	10	2520			#NV	6516	6740	6556	17.1						693.00
KLX 11A	703.00	723.00	1200	2400			#NV	6718	6928	6761	17.3						713.00
KLX 11A	723.00	743.00	#NV	#NV			#NV	#NV	#NV	#NV	17.6						733.00
KLX 11A	743.00	763.00	#NV	#NV			#NV	#NV	#NV	#NV	17.9						753.00
KLX 11A	763.00	783.00	#NV	#NV			#NV	#NV	#NV	#NV	18.2						773.00
KLX 11A	783.00	803.00	#NV	#NV			#NV	#NV	#NV	#NV	18.5						793.00
KLX 11A	803.00	823.00	#NV	#NV			#NV	#NV	#NV	#NV	18.8						813.00
KLX 11A	823.00	843.00	#NV	#NV			#NV	#NV	#NV	#NV	19.1						833.00
KLX 11A	843.00	863.00	1200	1200			#NV	7983	8223	8013	19.5						853.00
KLX 11A	863.00	883.00	#NV	#NV			#NV	#NV	#NV	#NV	19.8						873.00
KLX 11A	303.00	308.00	1200	1200			10.66	2823	3024	2823	11.1						305.50

idcode	start_date	stop_date	secup	seclow	section_no	test_type	formation_type	start_flow_period	stop_flow_period	flow_rate_end_qp	value_type_qp	mean_flow_rate_qm	q_measl__l	q_measl__u	tot_volume_vp
KLX 11A	060712 09:30:00	060712 10:51:00	308.00	313.00		3	1	2006-07-12 10:08:49	2006-07-12 10:28:59	5.33E-05	0	5.61E-05	1.67E-08	8.33E-04	6.73E-02
KLX 11A	060712 11:13:00	060712 12:03:00	313.00	318.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060712 13:09:00	060712 13:57:00	318.00	323.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060712 14:31:00	060712 16:11:00	343.00	348.00		3	1	2006-07-12 15:29:26	2006-07-12 15:49:36	1.67E-07	0	3.33E-07	1.67E-08	8.33E-04	4.00E-04
KLX 11A	060712 16:38:00	060712 17:38:00	348.00	353.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060712 17:56:00	060712 18:45:00	353.00	358.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060713 07:52:00	060713 08:41:00	358.00	363.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060713 09:14:00	060713 10:05:00	383.00	388.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060713 10:28:00	060713 11:17:00	388.00	393.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060713 12:29:00	060713 13:20:00	393.00	398.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060713 13:44:00	060713 15:16:00	398.00	403.00		3	1	2006-07-13 14:34:34	2006-07-13 14:54:44	8.33E-08	0	8.33E-08	1.67E-08	8.33E-04	1.00E-04
KLX 11A	060713 15:46:00	060713 16:55:00	423.00	428.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060713 16:59:00	060713 17:47:00	428.00	433.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060714 07:59:00	060714 08:46:00	433.00	438.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060714 09:17:00	060714 10:39:00	438.00	443.00		3	1	2006-07-14 09:57:00	2006-07-14 10:17:10	1.17E-06	0	1.16E-06	1.67E-08	8.33E-04	1.39E-03
KLX 11A	060714 11:06:00	060714 12:51:00	442.00	447.00		3	1	2006-07-14 11:42:39	2006-07-14 11:42:49	#NV	0	#NV	1.67E-08	8.33E-04	8.07E-06
KLX 11A	060714 13:16:00	060714 14:37:00	447.00	452.00		3	1	2006-07-14 13:55:05	2006-07-14 14:15:15	2.17E-07	0	2.17E-07	1.67E-08	8.33E-04	2.60E-04
KLX 11A	060714 15:01:00	060714 16:22:00	452.00	457.00		3	1	2006-07-14 15:40:42	2006-07-14 16:00:52	2.83E-07	0	2.95E-07	1.67E-08	8.33E-04	3.54E-04
KLX 11A	060714 16:45:00	060714 17:35:00	457.00	462.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060714 18:01:00	060714 18:50:00	462.00	467.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060715 08:16:00	060715 09:05:00	483.00	488.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060715 09:29:00	060715 10:19:00	488.00	493.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060715 10:47:00	060715 13:39:00	493.00	498.00		3	1	2006-07-15 13:08:52	2006-07-15 13:09:02	#NV	0	#NV	1.67E-08	8.33E-04	2.69E-06
KLX 11A	060715 14:04:00	060715 15:29:00	498.00	503.00		3	1	2006-07-15 14:47:28	2006-07-15 15:07:38	8.33E-08	0	1.00E-07	1.67E-08	8.33E-04	1.20E-04
KLX 11A	060715 15:53:00	060715 17:47:00	503.00	508.00		3	1	2006-07-15 17:05:25	2006-07-15 17:25:35	2.83E-07	0	2.83E-07	1.67E-08	8.33E-04	3.40E-04
KLX 11A	060715 18:09:00	060715 21:14:00	508.00	513.00		3	1	2006-07-15 18:52:09	2006-07-15 19:12:19	2.67E-07	0	3.12E-07	1.67E-08	8.33E-04	3.74E-04
KLX 11A	060716 08:05:00	060716 10:33:00	513.00	518.00		3	1	2006-08-08 16:33:36	2006-08-08 16:53:46	1.93E-05	0	1.98E-05	1.67E-08	8.33E-04	2.38E-02
KLX 11A	060808 17:47:00	060808 19:37:00	518.00	523.00		3	1	2006-08-08 18:55:36	2006-08-08 19:15:46	5.12E-05	0	5.33E-05	1.67E-08	8.33E-04	6.40E-02
KLX 11A	060809 08:08:00	060809 09:41:00	523.00	528.00		3	1	2006-08-09 08:59:28	2006-08-09 09:19:38	1.43E-07	0	1.43E-07	1.67E-08	8.33E-04	1.72E-04
KLX 11A	060809 10:08:00	060809 11:34:00	528.00	533.00		3	1	2006-08-09 10:52:02	2006-08-09 11:12:12	7.83E-07	0	8.33E-07	1.67E-08	8.33E-04	1.00E-03
KLX 11A	060809 12:48:00	060809 14:16:00	533.00	538.00		3	1	2006-08-09 13:34:21	2006-08-09 13:54:31	1.67E-06	0	1.75E-06	1.67E-08	8.33E-04	2.10E-03
KLX 11A	060809 14:40:00	060809 16:19:00	538.00	543.00		3	1	2006-08-09 15:37:49	2006-08-09 15:57:59	3.33E-08	0	4.50E-08	1.67E-08	8.33E-04	5.40E-05
KLX 11A	060809 16:59:00	060809 17:53:00	563.00	568.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060809 18:17:00	060809 19:11:00	568.00	573.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060810 08:06:00	060810 09:34:00	573.00	578.00		3	1	2006-08-10 08:52:30	2006-08-10 09:12:40	6.85E-05	0	7.02E-05	1.67E-08	8.33E-04	8.42E-02
KLX 11A	060810 10:02:00	060810 11:28:00	578.00	583.00		3	1	2006-08-10 10:46:37	2006-08-10 11:06:47	9.33E-05	0	9.72E-05	1.67E-08	8.33E-04	1.17E-01
KLX 11A	060810 12:20:00	060810 14:15:00	583.00	588.00		3	1	2006-08-10 13:03:30	2006-08-10 13:03:40	#NV	0	#NV	1.67E-08	8.33E-04	2.97E-06
KLX 11A	060810 14:41:00	060810 16:05:00	588.00	593.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 11A	060810 16:33:00	060810 18:19:00	593.00	598.00		3	1	2006-08-10 17:12:19	2006-08-10 17:12:29	#NV	0	#NV	1.67E-08	8.33E-04	4.50E-06
KLX 11A	060811 08:01:00	060811 09:26:00	598.00	603.00		3	1	2006-08-11 08:44:30	2006-08-11 09:44:40	4.48E-06	0	4.80E-06	1.67E-08	8.33E-04	5.76E-03
KLX 11A	060811 10:29:00	060811 13:01:00	663.00	668.00		3	1	2006-08-11 12:18:56	2006-08-11 12:39:06	1.67E-08	0	2.50E-08	1.67E-08	8.33E-04	3.00E-05
KLX 11A	060811 13:30:00	060811 15:14:00	668.00	673.00		3	1	2006-08-11 14:08:51	2006-08-11 14:09:01	#NV	0	#NV	1.67E-08	8.33E-04	3.81E-06
KLX 11A	060811 15:38:00	060811 17:22:00	673.00	678.00		3	1	2006-08-11 16:15:05	2006-08-11 16:15:15	#NV	0	#NV	1.67E-08	8.33E-04	2.92E-06
KLX 11A	060811 17:45:00	060811 20:53:00	678.00	683.00		3	1	2006-08-11 18:21:34	2006-08-11 18:21:44	#NV	0	#NV	1.67E-08	8.33E-04	3.75E-06

idcode	secup	seclow	dur_flow_phase_tp	dur_rec_phase_tf	initial_head_hi	head_at_flow_end_hp	final_head_hf	initial_press_pi	press_at_flow_end_pp	final_press_pf	fluid_temp_tew	fluid_elcond_ecw	fluid_salinity_tdsw	fluid_salinity_tdswm	reference	comments	lp
KLX 11A	308.00	313.00	1200	1200			10.48	2871	3071	2871	11.3						310.50
KLX 11A	313.00	318.00	#NV	#NV			#NV	#NV	#NV	#NV	11.4						315.50
KLX 11A	318.00	323.00	#NV	#NV			#NV	#NV	#NV	#NV	11.5						320.50
KLX 11A	343.00	348.00	1200	1200			#NV	3222	3432	3312	11.8						345.50
KLX 11A	348.00	353.00	#NV	#NV			#NV	#NV	#NV	#NV	11.9						350.50
KLX 11A	353.00	358.00	#NV	#NV			#NV	#NV	#NV	#NV	12.0						355.50
KLX 11A	358.00	363.00	#NV	#NV			#NV	#NV	#NV	#NV	12.0						360.50
KLX 11A	383.00	388.00	#NV	#NV			#NV	#NV	#NV	#NV	12.4						385.50
KLX 11A	388.00	393.00	#NV	#NV			#NV	#NV	#NV	#NV	12.5						390.50
KLX 11A	393.00	398.00	#NV	#NV			#NV	#NV	#NV	#NV	12.5						395.50
KLX 11A	398.00	403.00	1200	1200			11.32	3717	3951	3715	12.6						400.50
KLX 11A	423.00	428.00	#NV	#NV			#NV	#NV	#NV	#NV	13.0						425.50
KLX 11A	428.00	433.00	#NV	#NV			#NV	#NV	#NV	#NV	13.0						430.50
KLX 11A	433.00	438.00	#NV	#NV			#NV	#NV	#NV	#NV	13.1						435.50
KLX 11A	438.00	443.00	1200	1200			11.68	4087	4288	4088	13.2						440.50
KLX 11A	442.00	447.00	10	3840			#NV	4147	4357	4150	13.3						444.50
KLX 11A	447.00	452.00	1200	1200			12.05	4176	4377	4175	13.3						449.50
KLX 11A	452.00	457.00	1200	1200			12.02	4222	4430	4221	13.4						454.50
KLX 11A	457.00	462.00	#NV	#NV			#NV	#NV	#NV	#NV	13.5						459.50
KLX 11A	462.00	467.00	#NV	#NV			#NV	#NV	#NV	#NV	13.5						464.50
KLX 11A	483.00	488.00	#NV	#NV			#NV	#NV	#NV	#NV	13.8						485.50
KLX 11A	488.00	493.00	#NV	#NV			#NV	#NV	#NV	#NV	13.9						490.50
KLX 11A	493.00	498.00	10	1500			#NV	4613	4839	4617	14.0						495.50
KLX 11A	498.00	503.00	1200	1200			12.35	4652	4893	4652	14.0						500.50
KLX 11A	503.00	508.00	1200	1200			11.38	4705	4887	4735	14.1						505.50
KLX 11A	508.00	513.00	1200	7200			11.83	4751	4950	4746	14.2						510.50
KLX 11A	513.00	518.00	1200	1200			12.81	4795	4996	4794	14.3						515.50
KLX 11A	518.00	523.00	1200	1200			12.49	4842	5042	4844	14.4						520.50
KLX 11A	523.00	528.00	1200	1200			12.24	4885	5086	4884	14.5						525.50
KLX 11A	528.00	533.00	1200	1200			12.73	4932	5132	4931	14.6						530.50
KLX 11A	533.00	538.00	1200	1200			12.96	4981	5180	4981	14.6						535.50
KLX 11A	538.00	543.00	1200	1200			13.13	5032	5274	5032	14.7						540.50
KLX 11A	563.00	568.00	#NV	#NV			#NV	#NV	#NV	#NV	15.0						565.50
KLX 11A	568.00	573.00	#NV	#NV			#NV	#NV	#NV	#NV	15.1						570.50
KLX 11A	573.00	578.00	1200	1200			12.90	5350	5550	5351	15.2						575.50
KLX 11A	578.00	583.00	1200	1200			13.02	5397	5598	5399	15.1						580.50
KLX 11A	583.00	588.00	10	3888			#NV	5452	5694	5519	15.4						585.50
KLX 11A	588.00	593.00	#NV	#NV			#NV	#NV	#NV	#NV	15.4						590.50
KLX 11A	593.00	598.00	10	3679			#NV	5546	5784	5719	15.5						595.50
KLX 11A	598.00	603.00	1200	1200			13.12	5582	5782	5586	15.6						600.50
KLX 11A	663.00	668.00	1200	1200			#NV	6196	6428	6261	16.5						665.50
KLX 11A	668.00	673.00	10	3582			#NV	6245	6458	6366	16.6						670.50
KLX 11A	673.00	678.00	10	3693			#NV	6288	6534	6296	16.7						675.50
KLX 11A	678.00	683.00	10	9105			#NV	6332	6578	6338	16.8						680.50

Table	plu_s_hole_test_ed1
	PLU Single hole tests, pumping/injection. Basic evaluation

Column	Datatype	Unit	Column Description
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		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.
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)
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)
formation_width_b	FLOAT	m	b:Aquifer thickness repr. for T(generally b=Lw) ,see descr.
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...
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
u_measl_q_s	FLOAT	m**2/s	Estimated upper meas. limit for evaluated TT,see description
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
cd	FLOAT		CD: Dimensionless wellbore storage coefficient
skin	FLOAT		Skin factor;best estimate of flow/recovery period,see descr.
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
t2	FLOAT	s	Stop time for evaluated parameter from start of flow period
dte1	FLOAT	s	Start time for evaluated parameter from start of recovery
dte2	FLOAT	s	Stop time for evaluated parameter from start of recovery
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..
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)

idcode	start_date	stop_date	secup	seclow	section_no	test_type	formation_type	lp	seclen_class	spec_capacity_q_s	value_type_q_s	transmissivity_tq	value_type_tq	bc_tq	transmissivity_moye
KLX 11A	060629 14:32:00	060629 16:40:00	103.00	203.00		3	1	153.00	100	6.51E-06	0				8.47E-06
KLX 11A	060629 18:03:00	060629 20:21:00	203.00	303.00		3	1	253.00	100	7.48E-06	0				9.74E-06
KLX 11A	060630 09:15:00	060630 11:12:00	303.00	403.00		3	1	353.00	100	2.85E-06	0				3.71E-06
KLX 11A	060630 13:11:00	060630 15:20:00	403.00	503.00		3	1	453.00	100	5.61E-08	0				7.31E-08
KLX 11A	060701 08:47:00	060701 10:50:00	503.00	603.00		3	1	553.00	100	8.72E-06	0				1.14E-05
KLX 11A	060701 12:14:00	060701 15:43:00	603.00	703.00		3	1	653.00	100	1.60E-09	0				2.08E-09
KLX 11A	060701 17:09:00	060702 01:32:00	703.00	803.00		3	1	753.00	100	1.61E-09	0				2.10E-09
KLX 11A	060702 09:11:00	060702 13:33:00	803.00	903.00		3	1	853.00	100	3.62E-09	0				2.78E-09
KLX 11A	060702 14:45:00	060702 16:49:00	876.00	976.00		4B	1	926.00	100	#NV	-1				#NV
KLX 11A	060704 08:19:00	060704 09:46:00	103.00	123.00		3	1	113.00	20	1.14E-06	0				1.20E-06
KLX 11A	060704 10:31:00	060704 11:54:00	123.00	143.00		3	1	133.00	20	3.19E-06	0				3.34E-06
KLX 11A	060704 12:49:00	060704 14:32:00	143.00	163.00		3	1	153.00	20	3.16E-07	0				3.31E-07
KLX 11A	060704 15:05:00	060704 16:33:00	163.00	183.00		3	1	173.00	20	2.03E-06	0				2.13E-06
KLX 11A	060704 17:12:00	060704 18:14:00	183.00	203.00		3	1	193.00	20	#NV	-1				#NV
KLX 11A	060704 18:50:00	060704 19:46:00	203.00	223.00		3	1	213.00	20	#NV	-1				#NV
KLX 11A	060705 08:38:00	060705 10:07:00	223.00	243.00		4B	1	233.00	20	#NV	-1				#NV
KLX 11A	060705 10:48:00	060705 12:22:00	243.00	263.00		3	1	253.00	20	3.07E-08	0				3.21E-08
KLX 11A	060705 13:18:00	060705 14:44:00	263.00	283.00		3	1	273.00	20	8.05E-06	0				8.42E-06
KLX 11A	060705 15:25:00	060705 16:51:00	283.00	303.00		4B	1	293.00	20	#NV	-1				#NV
KLX 11A	060705 17:25:00	060705 18:49:00	303.00	323.00		3	1	313.00	20	2.85E-06	0				2.98E-06
KLX 11A	060705 19:21:00	060706 00:42:00	323.00	343.00		3	1	333.00	20	1.50E-10	0				1.57E-10
KLX 11A	060706 08:48:00	060706 10:30:00	343.00	363.00		3	1	353.00	20	7.55E-09	0				7.89E-09
KLX 11A	060706 11:03:00	060706 12:55:00	363.00	383.00		4B	1	373.00	20	#NV	-1				#NV
KLX 11A	060706 13:34:00	060706 15:02:00	383.00	403.00		3	1	393.00	20	3.42E-09	0				3.58E-09
KLX 11A	060706 15:54:00	060706 17:22:00	403.00	423.00		4B	1	413.00	20	#NV	-1				#NV
KLX 11A	060706 17:56:00	060706 19:21:00	423.00	443.00		3	1	433.00	20	4.86E-08	0				5.08E-08
KLX 11A	060707 08:32:00	060707 10:01:00	443.00	463.00		3	1	453.00	20	2.01E-08	0				2.10E-08
KLX 11A	060707 10:33:00	060707 12:34:00	463.00	483.00		4B	1	473.00	20	#NV	-1				#NV
KLX 11A	060707 13:12:00	060707 14:44:00	483.00	503.00		3	1	493.00	20	4.58E-09	0				4.79E-09
KLX 11A	060707 15:12:00	060707 16:39:00	503.00	523.00		3	1	513.00	20	2.86E-06	0				2.99E-06
KLX 11A	060707 17:07:00	060707 18:30:00	523.00	543.00		3	1	533.00	20	6.41E-08	0				6.71E-08
KLX 11A	060707 19:07:00	060708 08:26:00	543.00	563.00		4B	1	553.00	20	#NV	-1				#NV
KLX 11A	060708 08:58:00	060708 10:21:00	563.00	583.00		3	1	573.00	20	7.27E-06	0				7.60E-06
KLX 11A	060708 10:53:00	060708 12:23:00	583.00	603.00		3	1	593.00	20	2.11E-07	0				2.21E-07
KLX 11A	060708 13:17:00	060708 14:41:00	603.00	623.00		4B	1	613.00	20	#NV	-1				#NV
KLX 11A	060708 15:12:00	060708 16:39:00	623.00	643.00		4B	1	633.00	20	#NV	-1				#NV
KLX 11A	060708 17:11:00	060708 18:34:00	643.00	663.00		4B	1	653.00	20	#NV	-1				#NV
KLX 11A	060708 19:06:00	060709 08:39:00	663.00	683.00		3	1	673.00	20	6.39E-10	0				6.68E-10
KLX 11A	060709 09:11:00	060709 10:40:00	683.00	703.00		4B	1	693.00	20	#NV	-1				#NV
KLX 11A	060709 11:08:00	060709 13:27:00	703.00	723.00		3	1	713.00	20	2.34E-09	0				2.44E-09
KLX 11A	060709 13:58:00	060709 15:13:00	723.00	743.00		4B	1	733.00	20	#NV	-1				#NV
KLX 11A	060709 15:45:00	060709 16:56:00	743.00	763.00		4B	1	753.00	20	#NV	-1				#NV
KLX 11A	060709 17:25:00	060709 18:10:00	763.00	783.00		4B	1	773.00	20	#NV	-1				#NV
KLX 11A	060709 18:43:00	060709 20:01:00	783.00	803.00		4B	1	793.00	20	#NV	-1				#NV
KLX 11A	060710 08:19:00	060710 09:15:00	803.00	823.00		3	1	813.00	20	#NV	-1				#NV
KLX 11A	060710 09:45:00	060710 10:37:00	823.00	843.00		3	1	833.00	20	#NV	-1				#NV
KLX 11A	060710 11:10:00	060710 13:24:00	843.00	863.00		3	1	853.00	20	2.73E-09	0				2.85E-09
KLX 11A	060710 14:04:00	060710 14:56:00	863.00	883.00		3	1	873.00	20	#NV	-1				#NV
KLX 11A	060712 07:38:00	060712 09:06:00	303.00	308.00		3	1	305.50	5	5.16E-07	0				4.26E-07

idcode	secup	seclow	bc_tm	value_type_tm	hydr_cond_moye	formation_width_b	width_of_channel_b	tb	l_measl_tb	u_measl_tb	sb	assumed_sb	leakage_factor_lf	transmissivity_tt	value_type_tt	bc_tt	l_measl_q_s	u_measl_q_s
KLX 11A	103.00	203.00	0	0	8.47E-08									1.62E-05	0	1	8.00E-06	3.00E-05
KLX 11A	203.00	303.00	0	0	9.74E-04									3.21E-05	0	1	9.00E-06	5.00E-05
KLX 11A	303.00	403.00	0	0	3.71E-04									5.98E-06	0	1	3.00E-06	9.00E-06
KLX 11A	403.00	503.00	0	0	7.31E-06									2.74E-07	0	1	8.00E-08	6.00E-07
KLX 11A	503.00	603.00	0	0	1.14E-03									2.35E-05	0	1	8.00E-06	5.00E-05
KLX 11A	603.00	703.00	0	0	2.08E-07									2.33E-10	0	1	9.00E-11	6.00E-10
KLX 11A	703.00	803.00	0	0	2.10E-07									1.98E-10	0	1	9.00E-11	4.00E-10
KLX 11A	803.00	903.00	0	0	2.78E-07									2.94E-09	0	1	8.00E-10	4.00E-09
KLX 11A	876.00	976.00	0	-1	#NV									4.02E-11	0	1	1.00E-11	8.00E-11
KLX 11A	103.00	123.00	0	0	2.40E-05									4.90E-06	0	1	3.00E-06	8.00E-06
KLX 11A	123.00	143.00	0	0	6.68E-05									8.11E-06	0	1	7.00E-06	1.00E-05
KLX 11A	143.00	163.00	0	0	6.62E-06									1.43E-07	0	1	8.00E-08	4.00E-07
KLX 11A	163.00	183.00	0	0	4.26E-05									6.48E-06	0	1	4.00E-06	1.00E-05
KLX 11A	183.00	203.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	203.00	223.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	223.00	243.00	0	-1	#NV									3.29E-10	0	1	1.00E-10	6.00E-10
KLX 11A	243.00	263.00	0	0	6.42E-07									3.68E-08	0	1	8.00E-09	8.00E-08
KLX 11A	263.00	283.00	0	0	1.68E-04									3.56E-05	0	1	9.00E-06	6.00E-05
KLX 11A	283.00	303.00	0	-1	#NV									2.20E-11	0	1	9.00E-12	6.00E-11
KLX 11A	303.00	323.00	0	0	5.96E-05									5.77E-06	0	1	3.00E-06	9.00E-06
KLX 11A	323.00	343.00	0	0	3.14E-09									5.45E-11	0	1	2.00E-11	9.00E-11
KLX 11A	343.00	363.00	0	0	1.58E-07									4.25E-09	0	1	1.00E-09	8.00E-09
KLX 11A	363.00	383.00	0	-1	#NV									1.05E-11	0	1	9.00E-12	5.00E-11
KLX 11A	383.00	403.00	0	0	7.16E-08									3.27E-09	0	1	9.00E-10	5.00E-09
KLX 11A	403.00	423.00	0	-1	#NV									2.93E-11	0	1	9.00E-12	8.00E-11
KLX 11A	423.00	443.00	0	0	1.02E-06									1.99E-07	0	1	8.00E-08	6.00E-07
KLX 11A	443.00	463.00	0	0	4.20E-07									3.10E-08	0	1	9.00E-09	6.00E-08
KLX 11A	463.00	483.00	0	-1	#NV									5.69E-11	0	1	2.00E-11	9.00E-11
KLX 11A	483.00	503.00	0	0	9.58E-08									2.52E-09	0	1	9.00E-10	5.00E-09
KLX 11A	503.00	523.00	0	0	5.98E-05									4.11E-06	0	1	1.00E-06	7.00E-06
KLX 11A	523.00	543.00	0	0	1.34E-06									2.17E-07	0	1	8.00E-08	6.00E-07
KLX 11A	543.00	563.00	0	-1	#NV									1.22E-12	0	1	7.00E-13	4.00E-12
KLX 11A	563.00	583.00	0	0	1.52E-04									2.73E-05	0	1	9.00E-06	5.00E-05
KLX 11A	583.00	603.00	0	0	4.42E-06									7.93E-07	0	1	5.00E-07	1.00E-06
KLX 11A	603.00	623.00	0	-1	#NV									4.37E-11	0	1	1.00E-11	9.00E-11
KLX 11A	623.00	643.00	0	-1	#NV									1.31E-11	0	1	9.00E-12	4.00E-11
KLX 11A	643.00	663.00	0	-1	#NV									2.12E-12	0	1	9.00E-13	6.00E-12
KLX 11A	663.00	683.00	0	0	1.34E-08									1.98E-10	0	1	9.00E-11	7.00E-10
KLX 11A	683.00	703.00	0	-1	#NV									1.55E-10	0	1	6.00E-11	3.00E-10
KLX 11A	703.00	723.00	0	0	4.88E-08									2.57E-10	0	1	8.00E-11	6.00E-10
KLX 11A	723.00	743.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	743.00	763.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	763.00	783.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	783.00	803.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	803.00	823.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	823.00	843.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	843.00	863.00	0	0	5.70E-08									8.20E-10	0	1	5.00E-10	1.00E-09
KLX 11A	863.00	883.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	303.00	308.00	0	0	2.13E-06									6.00E-07	0	1	2.00E-07	9.00E-07

idcode	secup	seclow	storativity_s	assumed_s	bc_s	ri	ri_index	leakage_coeff	hydr_cond_ksf	value_type_ksf	l_measl_ksf	u_measl_ksf	spec_storage_ssf	assumed_ssf	c	cd	skin	dt1	dt2
KLX 11A	103.00	203.00	1.00E-06	1.00E+06		192.28	0								3.08E-09	3.4E-01	6.70	0.73	21.10
KLX 11A	203.00	303.00	1.00E-06	1.00E-06		228.13	0								2.34E-09	2.6E-01	19.11	0.40	5.27
KLX 11A	303.00	403.00	1.00E-06	1.00E-06		42.22	1								4.38E-10	4.8E-02	14.20	1.78	9.33
KLX 11A	403.00	503.00	1.00E-06	1.00E-06		69.34	0								2.40E-10	2.6E-02	20.25	#NV	#NV
KLX 11A	503.00	603.00	1.00E-06	1.00E-06		211.02	0								3.25E-09	3.6E-01	7.43	0.68	22.28
KLX 11A	603.00	703.00	1.00E-06	1.00E-06		16.75	-1								1.94E-10	2.1E-02	-1.87	#NV	#NV
KLX 11A	703.00	803.00	1.00E-06	1.00E-06		39.38	0								2.35E-10	2.6E-02	-2.72	#NV	#NV
KLX 11A	803.00	903.00	1.00E-06	1.00E-06		44.63	-1								3.08E-10	3.4E-02	1.70	#NV	#NV
KLX 11A	876.00	976.00	1.00E-06	1.00E-06		11.34	0								2.57E-10	2.8E-02	-1.50	#NV	#NV
KLX 11A	103.00	123.00	1.00E-06	1.00E-06		116.43	0								6.32E-10	7.0E-02	19.67	0.61	6.73
KLX 11A	123.00	143.00	1.00E-06	1.00E-06		37.35	-1								1.23E-09	1.4E-01	7.92	0.47	1.60
KLX 11A	143.00	163.00	1.00E-06	1.00E-06		40.13	1								9.52E-11	1.0E-02	1.14	6.49	27.49
KLX 11A	163.00	183.00	1.00E-06	1.00E-06		124.85	0								6.67E-10	7.4E-02	10.93	0.49	16.72
KLX 11A	183.00	203.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	203.00	223.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	223.00	243.00	1.00E-06	1.00E-06		15.81	0								5.84E-11	6.4E-03	0.12	1.13	22.45
KLX 11A	243.00	263.00	1.00E-06	1.00E-06		#NV	-1								5.85E-11	6.4E-03	4.83	#NV	#NV
KLX 11A	263.00	283.00	1.00E-06	1.00E-06		191.15	0								3.17E-09	3.5E-01	19.00	0.55	5.08
KLX 11A	283.00	303.00	1.00E-06	1.00E-06		8.04	0								5.62E-11	6.2E-03	-0.72	#NV	#NV
KLX 11A	303.00	323.00	1.00E-06	1.00E-06		17.70	1								4.83E-10	5.3E-02	14.10	0.31	7.93
KLX 11A	323.00	343.00	1.00E-06	1.00E-06		23.29	-1								1.15E-11	1.3E-03	1.04	#NV	#NV
KLX 11A	343.00	363.00	1.00E-06	1.00E-06		#NV	1								2.49E-10	2.7E-02	-3.40	#NV	#NV
KLX 11A	363.00	383.00	1.00E-06	1.00E-06		8.09	0								3.59E-11	4.0E-03	0.00	15.64	60.85
KLX 11A	383.00	403.00	1.00E-06	1.00E-06		#NV	-1								6.14E-11	6.8E-03	2.51	#NV	#NV
KLX 11A	403.00	423.00	1.00E-06	1.00E-06		8.24	0								6.80E-11	7.5E-03	-1.01	#NV	#NV
KLX 11A	423.00	443.00	1.00E-06	1.00E-06		52.27	0								4.62E-11	5.1E-03	21.07	1.40	6.06
KLX 11A	443.00	463.00	1.00E-06	1.00E-06		32.89	0								5.04E-11	5.6E-03	4.99	0.38	17.02
KLX 11A	463.00	483.00	1.00E-06	1.00E-06		13.16	0								6.25E-11	6.9E-03	-0.33	9.04	32.95
KLX 11A	483.00	503.00	1.00E-06	1.00E-06		#NV	-1								5.96E-11	6.6E-03	0.22	#NV	#NV
KLX 11A	503.00	523.00	1.00E-06	1.00E-06		111.42	0								1.16E-09	1.3E-01	1.04	0.92	14.08
KLX 11A	523.00	543.00	1.00E-06	1.00E-06		53.41	0								8.54E-11	9.4E-03	15.00	2.05	14.05
KLX 11A	543.00	563.00	1.00E-06	1.00E-06		#NV	1								1.10E-11	1.2E-03	-0.41	#NV	#NV
KLX 11A	563.00	583.00	1.00E-06	1.00E-06		178.87	0								1.62E-09	1.8E-01	13.54	0.45	17.96
KLX 11A	583.00	603.00	1.00E-06	1.00E-06		#NV	1								1.61E-10	1.8E-02	14.69	#NV	#NV
KLX 11A	603.00	623.00	1.00E-06	1.00E-06		9.11	0								5.49E-11	6.1E-03	-0.74	2.90	35.22
KLX 11A	623.00	643.00	1.00E-06	1.00E-06		#NV	1								5.95E-11	6.6E-03	-1.49	#NV	#NV
KLX 11A	643.00	663.00	1.00E-06	1.00E-06		#NV	0								3.10E-11	3.4E-03	-0.96	#NV	#NV
KLX 11A	663.00	683.00	1.00E-06	1.00E-06		4.58	1								4.63E-11	5.1E-03	-1.64	2.68	15.04
KLX 11A	683.00	703.00	1.00E-06	1.00E-06		#NV	1								5.33E-11	5.9E-03	-0.13	#NV	#NV
KLX 11A	703.00	723.00	1.00E-06	1.00E-06		14.01	0								1.42E-10	1.6E-02	-3.12	#NV	#NV
KLX 11A	723.00	743.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	743.00	763.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	763.00	783.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	783.00	803.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	803.00	823.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	823.00	843.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	843.00	863.00	1.00E-06	1.00E-06		13.24	0								8.79E-11	9.7E-03	-2.28	#NV	#NV
KLX 11A	863.00	883.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	303.00	308.00	1.00E-06	1.00E-06		68.87	0								3.62E-11	4.0E-03	0.25	0.50	17.83

idcode	secup	seclow	t1	t2	dte1	dte2	p_horner	transmissivity_t_nlr	storativity_s_nlr	value_type_t_nlr	bc_t_nlr	c_nlr	cd_nlr	skin_nlr	transmissivity_t_grf	value_type_t_grf	bc_t_grf	storativity_s_grf	flow_dim_grf	comment
KLX 11A	103.00	203.00					1838.6								6.21E-06	0	0	1.00E-06	2.1	
KLX 11A	203.00	303.00					2776.6								8.10E-06	0	0	1.00E-06	2.1	
KLX 11A	303.00	403.00					3705.2								1.50E-06	0	0	1.00E-06	2.2	
KLX 11A	403.00	503.00					4649.1								#NV	0	0	1.00E-06	#NV	
KLX 11A	503.00	603.00					5579.0								9.04E-06	0	0	1.00E-06	2.1	
KLX 11A	603.00	703.00					6513.4								1.62E-09	0	0	1.00E-06	1.58	
KLX 11A	703.00	803.00					7429.3								6.04E-10	0	0	1.00E-06	1.5	
KLX 11A	803.00	903.00					8333.1								1.82E-09	0	0	1.00E-06	1.7	
KLX 11A	876.00	976.00					#NV								6.24E-10	0	0	1.00E-06	1.33	
KLX 11A	103.00	123.00					1092.9								#NV	0	0	1.00E-06	#NV	
KLX 11A	123.00	143.00					1275.5								1.20E-06	0	0	1.00E-06	2.3	
KLX 11A	143.00	163.00					1443.8								6.65E-08	0	0	1.00E-06	2.3	
KLX 11A	163.00	183.00					1650.5								#NV	0	0	1.00E-06	#NV	
KLX 11A	183.00	203.00					#NV								1.00E-11	-1	0	1.00E-06	#NV	
KLX 11A	203.00	223.00					#NV								1.00E-11	-1	0	1.00E-06	#NV	
KLX 11A	223.00	243.00					#NV								8.49E-10	0	0	1.00E-06	1.79	
KLX 11A	243.00	263.00					2401.2								#NV	0	0	1.00E-06	#NV	
KLX 11A	263.00	283.00					2589.2								#NV	0	0	1.00E-06	#NV	
KLX 11A	283.00	303.00					#NV								1.01E-10	0	0	1.00E-06	1.49	
KLX 11A	303.00	323.00					2958.2								9.73E-07	0	0	1.00E-06	2.3	
KLX 11A	323.00	343.00					3137.1								#NV	0	0	1.00E-06	#NV	
KLX 11A	343.00	363.00					#NV								4.25E-09	0	0	1.00E-06	1.6	
KLX 11A	363.00	383.00					#NV								3.21E-11	0	0	1.00E-06	1.75	
KLX 11A	383.00	403.00					3699.9								#NV	0	0	1.00E-06	#NV	
KLX 11A	403.00	423.00					#NV								1.81E-10	0	0	1.00E-06	1.45	
KLX 11A	423.00	443.00					4086.5								#NV	0	0	1.00E-06	#NV	
KLX 11A	443.00	463.00					4269.7								#NV	0	0	1.00E-06	#NV	
KLX 11A	463.00	483.00					#NV								1.59E-10	0	0	1.00E-06	1.7	
KLX 11A	483.00	503.00					4645.5								#NV	0	0	1.00E-06	#NV	
KLX 11A	503.00	523.00					4830.4								#NV	0	0	1.00E-06	#NV	
KLX 11A	523.00	543.00					5023.2								#NV	0	0	1.00E-06	#NV	
KLX 11A	543.00	563.00					#NV								1.74E-11	0	0	1.00E-06	1	
KLX 11A	563.00	583.00					5392.3								8.24E-06	0	0	1.00E-06	2.1	
KLX 11A	583.00	603.00					5581.5								7.93E-07	0	0	1.00E-06	1.95	
KLX 11A	603.00	623.00					#NV								1.09E-09	0	0	1.00E-06	1.5	
KLX 11A	623.00	643.00					#NV								#NV	0	0	1.00E-06	#NV	
KLX 11A	643.00	663.00					#NV								5.34E-12	0	0	1.00E-06	1.6	
KLX 11A	663.00	683.00					6317.5								#NV	0	0	1.00E-06	#NV	
KLX 11A	683.00	703.00					#NV								2.60E-10	0	0	1.00E-06	1.87	
KLX 11A	703.00	723.00					#NV								#NV	0	0	1.00E-06	#NV	
KLX 11A	723.00	743.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	743.00	763.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	763.00	783.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	783.00	803.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	803.00	823.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	823.00	843.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	843.00	863.00					#NV								#NV	0	0	1.00E-06	#NV	
KLX 11A	863.00	883.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	303.00	308.00					2822.7								1.47E-06	0	0	1.00E-06	1.9	

idcode	start_date	stop_date	secup	seclow	section_no	test_type	formation_type	lp	seclen_class	spec_capacity_q_s	value_type_q_s	transmissivity_tq	value_type_tq	bc_tq	transmissivity_moye
KLX 11A	060712 09:30:00	060712 10:51:00	308.00	313.00		3	1	310.50	5	2.62E-06	0				2.16E-06
KLX 11A	060712 11:13:00	060712 12:03:00	313.00	318.00		3	1	315.50	5	#NV	-1				#NV
KLX 11A	060712 13:09:00	060712 13:57:00	318.00	323.00		3	1	320.50	5	#NV	-1				#NV
KLX 11A	060712 14:31:00	060712 16:11:00	343.00	348.00		3	1	345.50	5	7.79E-09	0				6.43E-09
KLX 11A	060712 16:38:00	060712 17:38:00	348.00	353.00		3	1	350.50	5	#NV	-1				#NV
KLX 11A	060712 17:56:00	060712 18:45:00	353.00	358.00		3	1	355.50	5	#NV	-1				#NV
KLX 11A	060713 07:52:00	060713 08:41:00	358.00	363.00		3	1	360.50	5	#NV	-1				#NV
KLX 11A	060713 09:14:00	060713 10:05:00	383.00	388.00		3	1	385.50	5	#NV	-1				#NV
KLX 11A	060713 10:28:00	060713 11:17:00	388.00	393.00		3	1	390.50	5	#NV	-1				#NV
KLX 11A	060713 12:29:00	060713 13:20:00	393.00	398.00		3	1	395.50	5	#NV	-1				#NV
KLX 11A	060713 13:44:00	060713 15:16:00	398.00	403.00		3	1	400.50	5	3.49E-09	0				2.88E-09
KLX 11A	060713 15:46:00	060713 16:55:00	423.00	428.00		3	1	425.50	5	#NV	-1				#NV
KLX 11A	060713 16:59:00	060713 17:47:00	428.00	433.00		3	1	430.50	5	#NV	-1				#NV
KLX 11A	060714 07:59:00	060714 08:46:00	433.00	438.00		3	1	435.50	5	#NV	-1				#NV
KLX 11A	060714 09:17:00	060714 10:39:00	438.00	443.00		3	1	440.50	5	5.69E-08	0				4.70E-08
KLX 11A	060714 11:06:00	060714 12:51:00	442.00	447.00		4B	1	444.50	5	#NV	-1				#NV
KLX 11A	060714 13:16:00	060714 14:37:00	447.00	452.00		3	1	449.50	5	8.78E-09	0				1.06E-08
KLX 11A	060714 15:01:00	060714 16:22:00	452.00	457.00		3	1	454.50	5	1.34E-08	0				1.10E-08
KLX 11A	060714 16:45:00	060714 17:35:00	457.00	462.00		3	1	459.50	5	#NV	-1				#NV
KLX 11A	060714 18:01:00	060714 18:50:00	462.00	467.00		3	1	464.50	5	#NV	-1				#NV
KLX 11A	060715 08:16:00	060715 09:05:00	483.00	488.00		3	1	485.50	5	#NV	-1				#NV
KLX 11A	060715 09:29:00	060715 10:19:00	488.00	493.00		3	1	490.50	5	#NV	-1				#NV
KLX 11A	060715 10:47:00	060715 13:39:00	493.00	498.00		4B	1	495.50	5	#NV	-1				#NV
KLX 11A	060715 14:04:00	060715 15:29:00	498.00	503.00		3	1	500.50	5	3.90E-10	0				2.80E-09
KLX 11A	060715 15:53:00	060715 17:47:00	503.00	508.00		3	1	505.50	5	1.53E-08	0				1.26E-08
KLX 11A	060715 18:09:00	060715 21:14:00	508.00	513.00		3	1	510.50	5	1.31E-08	0				1.09E-08
KLX 11A	060808 15:30:00	060808 17:15:00	513.00	518.00		3	1	515.50	5	9.44E-07	0				7.79E-07
KLX 11A	060808 17:47:00	060808 19:37:00	518.00	523.00		3	1	520.50	5	2.51E-06	0				2.07E-06
KLX 11A	060809 08:08:00	060809 09:41:00	523.00	528.00		3	1	525.50	5	7.00E-09	0				5.77E-09
KLX 11A	060809 10:08:00	060809 11:34:00	528.00	533.00		3	1	530.50	5	3.84E-08	0				3.17E-08
KLX 11A	060809 12:48:00	060809 14:16:00	533.00	538.00		3	1	535.50	5	8.22E-08	0				6.78E-08
KLX 11A	060809 14:40:00	060809 16:19:00	538.00	543.00		3	1	540.50	5	1.35E-09	0				1.12E-09
KLX 11A	060809 16:59:00	060809 17:53:00	563.00	568.00		3	1	565.50	5	#NV	-1				#NV
KLX 11A	060809 18:17:00	060809 19:11:00	568.00	573.00		3	1	570.50	5	#NV	-1				#NV
KLX 11A	060810 08:06:00	060810 09:34:00	573.00	578.00		3	1	575.50	5	3.36E-06	0				2.77E-06
KLX 11A	060810 10:02:00	060810 11:28:00	578.00	583.00		3	1	580.50	5	4.56E-06	0				3.76E-06
KLX 11A	060810 12:20:00	060810 14:15:00	583.00	588.00		4B	1	585.50	5	#NV	-1				#NV
KLX 11A	060810 14:41:00	060810 16:05:00	588.00	593.00		4B	1	590.50	5	#NV	-1				#NV
KLX 11A	060810 16:33:00	060810 18:19:00	593.00	598.00		4B	1	595.50	5	#NV	-1				#NV
KLX 11A	060811 08:01:00	060811 09:26:00	598.00	603.00		3	1	600.50	5	2.20E-07	0				1.82E-07
KLX 11A	060811 10:29:00	060811 13:01:00	663.00	668.00		3	1	665.50	5	7.05E-10	0				5.82E-10
KLX 11A	060811 13:30:00	060811 15:14:00	668.00	673.00		4B	1	670.50	5	#NV	-1				#NV
KLX 11A	060811 15:38:00	060811 17:22:00	673.00	678.00		4B	1	675.50	5	#NV	-1				#NV
KLX 11A	060811 17:45:00	060811 20:53:00	678.00	683.00		4B	1	680.50	5	#NV	-1				#NV

idcode	secup	seclow	bc_tm	value_type_tm	hydr_cond_moye	formation_width_b	width_of_channel_b	tb	l_measl_tb	u_measl_tb	sb	assumed_sb	leakage_factor_lf	transmissivity_tt	value_type_tt	bc_tt	l_measl_q_s	u_measl_q_s
KLX 11A	308.00	313.00	0	0	1.08E-05									6.46E-06	0	1	2.00E-06	9.00E-06
KLX 11A	313.00	318.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	318.00	323.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	343.00	348.00	0	0	3.22E-08									3.58E-09	0	1	1.00E-09	8.00E-09
KLX 11A	348.00	353.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	353.00	358.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	358.00	363.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	383.00	388.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	388.00	393.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	393.00	398.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	398.00	403.00	0	0	1.44E-08									2.96E-09	0	1	9.00E-10	6.00E-09
KLX 11A	423.00	428.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	428.00	433.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	433.00	438.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	438.00	443.00	0	0	2.35E-07									1.89E-07	0	1	9.00E-08	5.00E-07
KLX 11A	442.00	447.00	0	-1	#NV									1.22E-10	0	1	8.00E-11	3.00E-10
KLX 11A	447.00	452.00	0	0	5.30E-08									1.37E-08	0	1	8.00E-09	3.00E-08
KLX 11A	452.00	457.00	0	0	5.50E-08									2.20E-08	0	1	8.00E-09	4.00E-08
KLX 11A	457.00	462.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	462.00	467.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	483.00	488.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	488.00	493.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	493.00	498.00	0	-1	#NV									2.60E-10	0	1	9.00E-11	4.00E-10
KLX 11A	498.00	503.00	0	0	1.40E-08									2.54E-09	0	1	8.00E-10	5.00E-09
KLX 11A	503.00	508.00	0	0	6.30E-08									1.08E-08	0	1	7.00E-09	5.00E-08
KLX 11A	508.00	513.00	0	0	5.45E-08									1.30E-08	0	1	7.00E-09	3.00E-08
KLX 11A	513.00	518.00	0	0	3.90E-06									4.04E-06	0	1	2.00E-06	6.00E-06
KLX 11A	518.00	523.00	0	0	1.04E-05									4.66E-06	0	1	2.00E-06	7.00E-06
KLX 11A	523.00	528.00	0	0	2.89E-08									4.24E-08	0	1	1.00E-08	7.00E-08
KLX 11A	528.00	533.00	0	0	1.59E-07									6.70E-08	0	1	3.00E-08	9.00E-08
KLX 11A	533.00	538.00	0	0	3.39E-07									3.74E-07	0	1	9.00E-08	6.00E-07
KLX 11A	538.00	543.00	0	0	5.60E-09									4.05E-09	0	1	1.00E-09	1.00E-08
KLX 11A	563.00	568.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	568.00	573.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	573.00	578.00	0	0	1.39E-05									1.50E-05	0	1	8.00E-06	3.00E-05
KLX 11A	578.00	583.00	0	0	1.88E-05									1.03E-05	0	1	8.00E-06	3.00E-05
KLX 11A	583.00	588.00	0	-1	#NV									1.16E-11	0	1	9.00E-12	4.00E-11
KLX 11A	588.00	593.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 11A	593.00	598.00	0	-1	#NV									4.24E-12	0	1	1.00E-12	7.00E-12
KLX 11A	598.00	603.00	0	0	9.10E-07									3.76E-07	0	1	9.00E-08	9.00E-07
KLX 11A	663.00	668.00	0	0	2.91E-09									1.34E-10	0	1	8.00E-11	4.00E-10
KLX 11A	668.00	673.00	0	-1	#NV									1.17E-11	0	1	9.00E-12	4.00E-11
KLX 11A	673.00	678.00	0	-1	#NV									8.98E-11	0	1	5.00E-11	2.00E-10
KLX 11A	678.00	683.00	0	-1	#NV									8.40E-11	0	1	6.00E-11	1.00E-10

idcode	secup	seclow	storativity_s	assumed_s	bc_s	ri	ri_index	leakage_coeff	hydr_cond_ksf	value_type_ksf	l_measl_ksf	u_measl_ksf	spec_storage_ssf	assumed_ssf	c	cd	skin	dt1	dt2
KLX 11A	308.00	313.00	1.00E-06	1.00E-06		60.40	1								3.46E-10	3.8E-02	20.10	3.33	12.15
KLX 11A	313.00	318.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	318.00	323.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	343.00	348.00	1.00E-06	1.00E-06		#NV	1								1.29E-10	1.4E-02	-3.62	#NV	#NV
KLX 11A	348.00	353.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	353.00	358.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	358.00	363.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	383.00	388.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	388.00	393.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	393.00	398.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	398.00	403.00	1.00E-06	1.00E-06		#NV	-1								1.95E-11	2.1E-03	3.08	#NV	#NV
KLX 11A	423.00	428.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	428.00	433.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	433.00	438.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	438.00	443.00	1.00E-06	1.00E-06		51.60	0								2.35E-11	2.6E-03	15.65	0.88	7.93
KLX 11A	442.00	447.00	1.00E-06	1.00E-06		4.25	-1								3.83E-11	4.2E-03	0.19	0.95	5.33
KLX 11A	447.00	452.00	1.00E-06	1.00E-06		26.77	0								1.32E-11	1.5E-03	3.49	1.95	13.05
KLX 11A	452.00	457.00	1.00E-06	1.00E-06		30.14	0								1.10E-11	1.2E-03	5.35	2.28	15.33
KLX 11A	457.00	462.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	462.00	467.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	483.00	488.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	488.00	493.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	493.00	498.00	1.00E-06	1.00E-06		11.11	0								1.19E-11	1.3E-03	1.05	0.47	23.02
KLX 11A	498.00	503.00	1.00E-06	1.00E-06		#NV	-1								2.22E-11	2.4E-03	1.60	#NV	#NV
KLX 11A	503.00	508.00	1.00E-06	1.00E-06		25.23	1								7.70E-10	8.5E-02	1.24	#NV	#NV
KLX 11A	508.00	513.00	1.00E-06	1.00E-06		8.52	1								1.78E-11	2.0E-03	-0.33	0.70	2.08
KLX 11A	513.00	518.00	1.00E-06	1.00E-06		110.94	0								4.90E-10	5.4E-02	19.89	1.15	8.73
KLX 11A	518.00	523.00	1.00E-06	1.00E-06		114.97	0								1.17E-09	1.3E-01	3.34	1.04	9.11
KLX 11A	523.00	528.00	1.00E-06	1.00E-06		35.51	-1								4.63E-11	5.1E-03	32.58	#NV	#NV
KLX 11A	528.00	533.00	1.00E-06	1.00E-06		39.81	0								2.26E-11	2.5E-03	5.03	1.09	11.33
KLX 11A	533.00	538.00	1.00E-06	1.00E-06		61.20	0								2.96E-11	3.3E-03	21.29	#NV	#NV
KLX 11A	538.00	543.00	1.00E-06	1.00E-06		19.74	-1								1.90E-11	2.1E-03	10.00	#NV	#NV
KLX 11A	563.00	568.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	568.00	573.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	573.00	578.00	1.00E-06	1.00E-06		154.00	0								7.68E-10	8.5E-02	19.70	0.53	8.47
KLX 11A	578.00	583.00	1.00E-06	1.00E-06		140.19	0								1.40E-09	1.5E-01	5.59	0.88	15.88
KLX 11A	583.00	588.00	1.00E-06	1.00E-06		8.22	1								1.23E-11	1.4E-03	-0.68	#NV	#NV
KLX 11A	588.00	593.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 11A	593.00	598.00	1.00E-06	1.00E-06		6.22	0								1.89E-11	2.1E-03	-0.03	#NV	#NV
KLX 11A	598.00	603.00	1.00E-06	1.00E-06		29.55	1								1.23E-10	1.4E-02	3.92	0.83	4.65
KLX 11A	663.00	668.00	1.00E-06	1.00E-06		8.42	1								3.94E-11	4.3E-03	-2.80	#NV	#NV
KLX 11A	668.00	673.00	1.00E-06	1.00E-06		7.91	0								1.65E-11	1.8E-03	0.30	6.71	42.07
KLX 11A	673.00	678.00	1.00E-06	1.00E-06		13.36	0								1.19E-11	1.3E-03	0.10	2.36	8.90
KLX 11A	678.00	683.00	1.00E-06	1.00E-06		20.64	0								1.52E-11	1.7E-03	-0.32	1.95	16.97

idcode	secup	seclow	t1	t2	dte1	dte2	p_horner	transmissivity_t_nlr	storativity_s_nlr	value_type_t_nlr	bc_t_nlr	c_nlr	cd_nlr	skin_nlr	transmissivity_t_grf	value_type_t_grf	bc_t_grf	storativity_s_grf	flow_dim_grf	comment
KLX 11A	308.00	313.00					2867.5								1.49E-06	0	0	1.00E-06	2.2	
KLX 11A	313.00	318.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	318.00	323.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	343.00	348.00					#NV								3.58E-09	0	0	1.00E-06	1.76	
KLX 11A	348.00	353.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	353.00	358.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	358.00	363.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	383.00	388.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	388.00	393.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	393.00	398.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	398.00	403.00					3712.4								#NV	0	0	1.00E-06	#NV	
KLX 11A	423.00	428.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	428.00	433.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	433.00	438.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	438.00	443.00					4087.3								2.77E-08	0	0	1.00E-06	2.2	
KLX 11A	442.00	447.00					#NV								1.20E-10	0	0	1.00E-06	2.23	
KLX 11A	447.00	452.00					4174.5								#NV	0	0	1.00E-06	#NV	
KLX 11A	452.00	457.00					4220.6								#NV	0	0	1.00E-06	#NV	
KLX 11A	457.00	462.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	462.00	467.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	483.00	488.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	488.00	493.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	493.00	498.00					#NV								#NV	0	0	1.00E-06	#NV	
KLX 11A	498.00	503.00					4650.5								#NV	0	0	1.00E-06	#NV	
KLX 11A	503.00	508.00					4687.3								7.87E-09	0	0	1.00E-06	2.1	
KLX 11A	508.00	513.00					4738.0								1.30E-08	0	0	1.00E-06	1.86	
KLX 11A	513.00	518.00					4794.0								#NV	0	0	1.00E-06	#NV	
KLX 11A	518.00	523.00					4837.1								#NV	0	0	1.00E-06	#NV	
KLX 11A	523.00	528.00					4881.0								#NV	0	0	1.00E-06	#NV	
KLX 11A	528.00	533.00					4932.1								3.14E-09	0	0	1.00E-06	3.0	
KLX 11A	533.00	538.00					4980.7								2.78E-08	0	0	1.00E-06	2.3	
KLX 11A	538.00	543.00					5028.7								#NV	0	0	1.00E-06	#NV	
KLX 11A	563.00	568.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	568.00	573.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	573.00	578.00					5350.3								#NV	0	0	1.00E-06	#NV	
KLX 11A	578.00	583.00					5397.7								4.15E-06	0	0	1.00E-06	2.1	
KLX 11A	583.00	588.00					#NV								2.55E-10	0	0	1.00E-06	1.4	
KLX 11A	588.00	593.00					#NV								#NV	-1	0	1.00E-06	#NV	
KLX 11A	593.00	598.00					#NV								#NV	0	0	1.00E-06	#NV	
KLX 11A	598.00	603.00					5583.6								#NV	0	0	1.00E-06	#NV	
KLX 11A	663.00	668.00					#NV								#NV	0	0	1.00E-06	#NV	
KLX 11A	668.00	673.00					#NV								5.67E-11	0	0	1.00E-06	1.6	
KLX 11A	673.00	678.00					#NV								#NV	0	0	1.00E-06	#NV	
KLX 11A	678.00	683.00					#NV								#NV	0	0	1.00E-06	#NV	

Table	plu_s_hole_test_obs
	Data of observation sections of single hole test

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)

idcode	start_date	stop_date	secup	seclow	section_no	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KLX 11A	060629 14:32:00	060629 16:40:00	103.00	203.00		204.00	992.29	915	917	917	1872	1872	1872	
KLX 11A	060629 18:03:00	060629 20:21:00	203.00	303.00		304.00	992.29	1846	1846	1846	2807	2807	2807	
KLX 11A	060630 09:15:00	060630 11:12:00	303.00	403.00		404.00	992.29	2777	2777	2778	3741	3741	3741	
KLX 11A	060630 13:11:00	060630 15:20:00	403.00	503.00		504.00	992.29	3712	3712	3712	4675	4675	4675	
KLX 11A	060701 08:47:00	060701 10:50:00	503.00	603.00		604.00	992.29	4641	4641	4642	5607	5604	5599	
KLX 11A	060701 12:14:00	060701 15:43:00	603.00	703.00		704.00	992.29	5577	5578	5578	6532	6531	6530	
KLX 11A	060701 17:09:00	060702 01:32:00	703.00	803.00		804.00	992.29	6507	6506	6502	7453	7452	7449	
KLX 11A	060702 09:11:00	060702 13:33:00	803.00	903.00		904.00	992.29	7425	7426	7428	8452	8445	8423	
KLX 11A	060702 14:45:00	060702 16:49:00	876.00	976.00		977.00	992.29	8100	8100	8100	9484	9487	9515	
KLX 11A	060704 08:19:00	060704 09:46:00	103.00	123.00		124.00	992.29	918	922	924	1123	1123	1123	
KLX 11A	060704 10:31:00	060704 11:54:00	123.00	143.00		144.00	992.29	1106	1110	1112	1310	1310	1310	
KLX 11A	060704 12:49:00	060704 14:32:00	143.00	163.00		164.00	992.29	1293	1294	1295	1498	1498	1498	
KLX 11A	060704 15:05:00	060704 16:33:00	163.00	183.00		184.00	992.29	1480	1482	1483	1686	1686	1686	
KLX 11A	060704 17:12:00	060704 18:14:00	183.00	203.00		204.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060704 18:50:00	060704 19:46:00	203.00	223.00		224.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060705 08:38:00	060705 10:07:00	223.00	243.00		244.00	992.29	2034	2034	2036	2246	2246	2246	
KLX 11A	060705 10:48:00	060705 12:22:00	243.00	263.00		264.00	992.29	2221	2221	2221	2434	2434	2434	
KLX 11A	060705 13:18:00	060705 14:44:00	263.00	283.00		284.00	992.29	2406	2407	2407	2622	2622	2622	
KLX 11A	060705 15:25:00	060705 16:51:00	283.00	303.00		304.00	992.29	2588	2588	2588	2809	2809	2808	
KLX 11A	060705 17:25:00	060705 18:49:00	303.00	323.00		324.00	992.29	2775	2775	2775	2995	2995	2995	
KLX 11A	060705 19:21:00	060706 00:42:00	323.00	343.00		344.00	992.29	2961	2961	2961	3182	3182	3181	
KLX 11A	060706 08:48:00	060706 10:30:00	343.00	363.00		364.00	992.29	3148	3148	3148	3367	3367	3368	
KLX 11A	060706 11:03:00	060706 12:55:00	363.00	383.00		384.00	992.29	3335	3335	3335	3555	3555	3555	
KLX 11A	060706 13:34:00	060706 15:02:00	383.00	403.00		404.00	992.29	3522	3522	3522	3742	3742	3742	
KLX 11A	060706 15:54:00	060706 17:22:00	403.00	423.00		424.00	992.29	3708	3708	3707	3928	3928	3928	
KLX 11A	060706 17:56:00	060706 19:21:00	423.00	443.00		444.00	992.29	3894	3894	3894	4114	4114	4114	
KLX 11A	060707 08:32:00	060707 10:01:00	443.00	463.00		464.00	992.29	4078	4078	4078	4297	4297	4297	
KLX 11A	060707 10:33:00	060707 12:34:00	463.00	483.00		484.00	992.29	4265	4265	4265	4485	4485	4485	
KLX 11A	060707 13:12:00	060707 14:44:00	483.00	503.00		504.00	992.29	4455	4455	4455	4673	4673	4673	
KLX 11A	060707 15:12:00	060707 16:39:00	503.00	523.00		524.00	992.29	4642	4642	4642	4859	4860	4860	
KLX 11A	060707 17:07:00	060707 18:30:00	523.00	543.00		544.00	992.29	4829	4829	4829	5046	5046	5046	
KLX 11A	060707 19:07:00	060708 08:26:00	543.00	563.00		564.00	992.29	5015	5015	5014	5231	5231	5229	
KLX 11A	060708 08:58:00	060708 10:21:00	563.00	583.00		584.00	992.29	5201	5202	5202	5416	5425	5418	
KLX 11A	060708 10:53:00	060708 12:23:00	583.00	603.00		604.00	992.29	5388	5389	5389	5610	5605	5602	
KLX 11A	060708 13:17:00	060708 14:41:00	603.00	623.00		624.00	992.29	5576	5576	5575	5799	5799	5790	
KLX 11A	060708 15:12:00	060708 16:39:00	623.00	643.00		644.00	992.29	5762	5762	5762	5985	5986	5976	
KLX 11A	060708 17:11:00	060708 18:34:00	643.00	663.00		664.00	992.29	5949	5949	5949	6173	6173	6164	
KLX 11A	060708 19:06:00	060709 08:39:00	663.00	683.00		684.00	992.29	6135	6135	6135	6338	6338	6338	
KLX 11A	060709 09:11:00	060709 10:40:00	683.00	703.00		704.00	992.29	6319	6319	6319	6541	6541	6536	
KLX 11A	060709 11:08:00	060709 13:27:00	703.00	723.00		724.00	992.29	6506	6506	6506	6717	6712	6708	
KLX 11A	060709 13:58:00	060709 15:13:00	723.00	743.00		744.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060709 15:45:00	060709 16:56:00	743.00	763.00		764.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060709 17:25:00	060709 18:10:00	763.00	783.00		784.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060709 18:43:00	060709 20:01:00	783.00	803.00		804.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060710 08:19:00	060710 09:15:00	803.00	823.00		824.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060710 09:45:00	060710 10:37:00	823.00	843.00		844.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060710 11:10:00	060710 13:24:00	843.00	863.00		864.00	992.29	7800	7801	7801	8092	8086	8081	
KLX 11A	060710 14:04:00	060710 14:56:00	863.00	883.00		884.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060712 07:38:00	060712 09:06:00	303.00	308.00		309.00	992.29	2778	2778	2778	2855	2856	2856	

idcode	start_date	stop_date	secup	seclow	section_no	obs_secup	obs_seclow	pi_above	pp_above	pf_above	pi_below	pp_below	pf_below	comments
KLX 11A	060712 09:30:00	060712 10:51:00	308.00	313.00		314.00	992.29	2825	2825	2825	2903	2903	2903	
KLX 11A	060712 11:13:00	060712 12:03:00	313.00	318.00		319.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060712 13:09:00	060712 13:57:00	318.00	323.00		324.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060712 14:31:00	060712 16:11:00	343.00	348.00		349.00	992.29	3153	3153	3152	3230	3230	3230	
KLX 11A	060712 16:38:00	060712 17:38:00	348.00	353.00		354.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060712 17:56:00	060712 18:45:00	353.00	358.00		359.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060713 07:52:00	060713 08:41:00	358.00	363.00		364.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060713 09:14:00	060713 10:05:00	383.00	388.00		389.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060713 10:28:00	060713 11:17:00	388.00	393.00		394.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060713 12:29:00	060713 13:20:00	393.00	398.00		399.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060713 13:44:00	060713 15:16:00	398.00	403.00		404.00	992.29	3665	3665	3665	3741	3741	3741	
KLX 11A	060713 15:46:00	060713 16:55:00	423.00	428.00		429.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060713 16:59:00	060713 17:47:00	428.00	433.00		434.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060714 07:59:00	060714 08:46:00	433.00	438.00		439.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060714 09:17:00	060714 10:39:00	438.00	443.00		444.00	992.29	4038	4038	4038	4114	4115	4115	
KLX 11A	060714 11:06:00	060714 12:51:00	442.00	447.00		448.00	992.29	4149	4149	4150	4154	4154	4154	
KLX 11A	060714 13:16:00	060714 14:37:00	447.00	452.00		453.00	992.29	4124	4124	4124	4200	4200	4200	
KLX 11A	060714 15:01:00	060714 16:22:00	452.00	457.00		458.00	992.29	4170	4170	4171	4246	4247	4247	
KLX 11A	060714 16:45:00	060714 17:35:00	457.00	462.00		463.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060714 18:01:00	060714 18:50:00	462.00	467.00		468.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060715 08:16:00	060715 09:05:00	483.00	488.00		489.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060715 09:29:00	060715 10:19:00	488.00	493.00		494.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060715 10:47:00	060715 13:39:00	493.00	498.00		499.00	992.29	4553	4554	4554	4629	4629	4629	
KLX 11A	060715 14:04:00	060715 15:29:00	498.00	503.00		504.00	992.29	4601	4601	4601	4676	4676	4676	
KLX 11A	060715 15:53:00	060715 17:47:00	503.00	508.00		509.00	992.29	4647	4647	4647	4722	4722	4722	
KLX 11A	060715 18:09:00	060715 21:14:00	508.00	513.00		514.00	992.29	4693	4693	4693	4768	4768	4678	
KLX 11A	060808 15:30:00	060808 17:15:00	513.00	518.00		519.00	992.29	4743	4743	4743	4817	4819	4818	
KLX 11A	060808 17:47:00	060808 19:37:00	518.00	523.00		524.00	992.29	4789	4789	4789	4864	4866	4865	
KLX 11A	060809 08:08:00	060809 09:41:00	523.00	528.00		529.00	992.29	4831	4831	4831	4907	4907	4907	
KLX 11A	060809 10:08:00	060809 11:34:00	528.00	533.00		534.00	992.29	4879	4879	4879	4954	4954	4955	
KLX 11A	060809 12:48:00	060809 14:16:00	533.00	538.00		539.00	992.29	4927	4927	4927	5002	5002	5002	
KLX 11A	060809 14:40:00	060809 16:19:00	538.00	543.00		544.00	992.29	4974	4974	4974	5049	5049	5049	
KLX 11A	060809 16:59:00	060809 17:53:00	563.00	568.00		569.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060809 18:17:00	060809 19:11:00	568.00	573.00		574.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060810 08:06:00	060810 09:34:00	573.00	578.00		579.00	992.29	5297	5298	5298	5372	5386	5373	
KLX 11A	060810 10:02:00	060810 11:28:00	578.00	583.00		584.00	992.29	5345	5346	5346	5419	5425	5421	
KLX 11A	060810 12:20:00	060810 14:15:00	583.00	588.00		589.00	992.29	5393	5393	5393	5467	5467	5467	
KLX 11A	060810 14:41:00	060810 16:05:00	588.00	593.00		594.00	992.29	#NV	#NV	#NV	#NV	#NV	#NV	
KLX 11A	060810 16:33:00	060810 18:19:00	593.00	598.00		599.00	992.29	5486	5486	5487	5562	5562	5560	
KLX 11A	060811 08:01:00	060811 09:26:00	598.00	603.00		604.00	992.29	5530	5530	5530	5606	5602	5600	
KLX 11A	060811 10:29:00	060811 13:01:00	663.00	668.00		669.00	992.29	6137	6137	6137	6202	6202	6200	
KLX 11A	060811 13:30:00	060811 15:14:00	668.00	673.00		674.00	992.29	6184	6184	6184	6260	6260	6249	
KLX 11A	060811 15:38:00	060811 17:22:00	673.00	678.00		679.00	992.29	6230	6230	6230	6311	6311	6295	
KLX 11A	060811 17:45:00	060811 20:53:00	678.00	683.00		684.00	992.29	6276	6276	6277	6352	6352	6339	