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Oskarshamn site investigation

Hydraulic injection tests in borehole KLX15A, 2007

Subarea Laxemar

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October 2007

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

Abstract

Hydraulic injection tests have been performed in borehole KLX15A at the Laxemar area, Oskarshamn. The tests are part of the general program for site investigations and specifically for the Laxemar subarea. 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 KLX15A performed between 10th and 30th of April 2007.

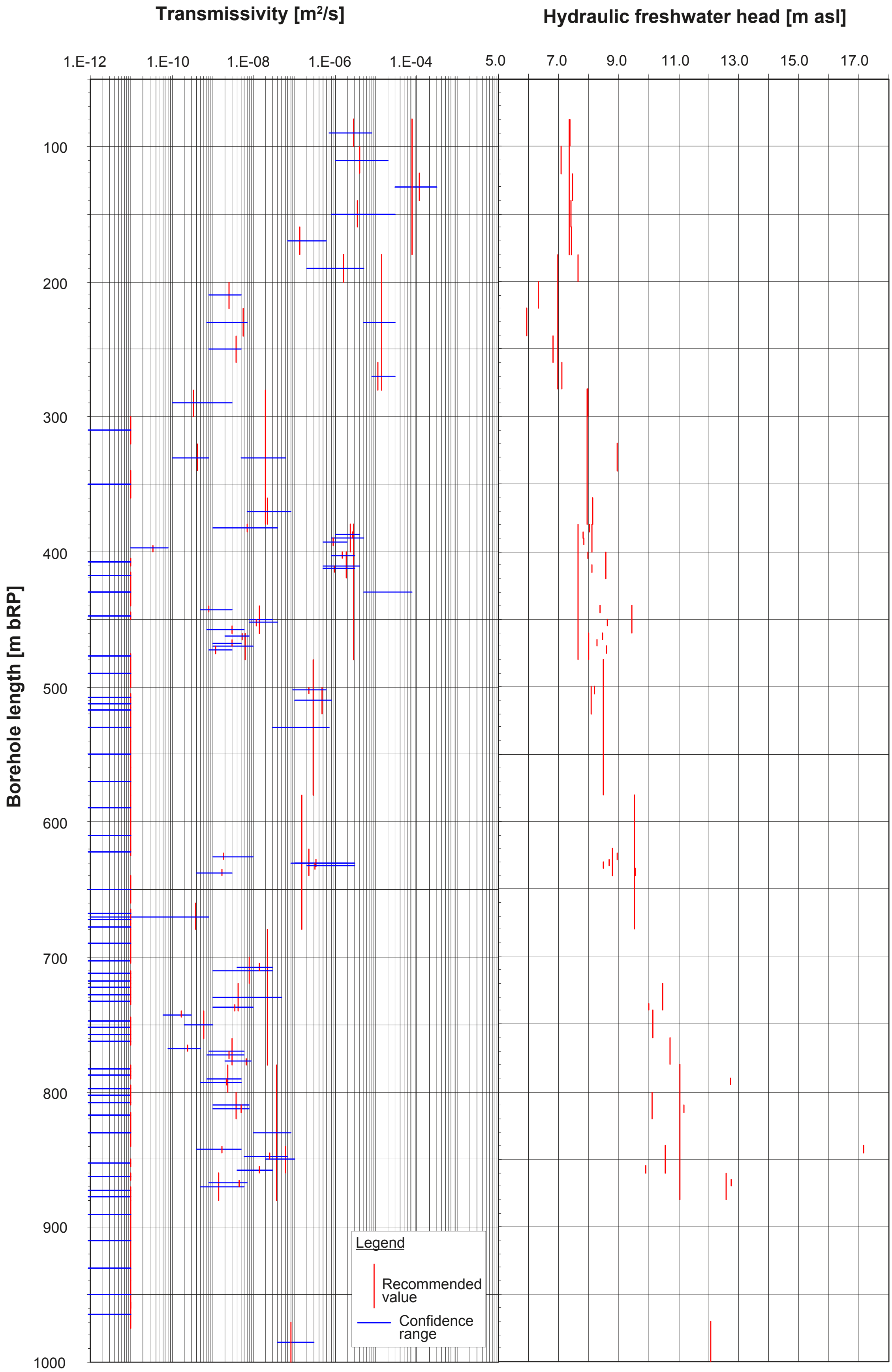
The objective of the hydrotests was to describe the rock around the borehole with respect of hydraulic parameters, mainly transmissivity (T) and hydraulic conductivity (K) at different measurement scales of 100 m, 20 m and 5 m sections. Transient evaluation during flow and recovery period provided additional information such as flow regimes, hydraulic boundaries and cross-over flows. Constant pressure injection tests were conducted between 80.00–1,000.43 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 KLX15A 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 injektions-testerna i borrhål KLX15A. Testerna utfördes mellan den 10 april till den 30 april 2007.

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 återhämtningsfasen gav ytterligare information avseende flödesgeometri, hydrauliska gränser och sprickläckage. Injektionstester utfördes mellan 80,00–1 000,43 m borrhålslängd. Resultaten av testutvärderingen presenteras som transmissivitet, hydraulisk konduktivitet och grundvattennivå uttryckt i ekvivalent sötvattenpelare (fresh-water head).



Borehole KLX15A – 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 2006/. 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 KLX15A between 12th and 28th of April 2007 following the methodology described in SKB MD 323.001e and in the activity plan AP PS 400-07-007 (SKB controlling documents). Data and results were delivered to the SKB site characterization 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 KLX15A. The commission was conducted by Golder Associates AB and Golder Associates GmbH.

Borehole KLX15A is situated in the Laxemar area approximately 4 km west of the nuclear power plant of Simpevarp, Figure 1-1. The borehole was drilled from December 2006 to February 2007 at 1,000.43 m length with an inner diameter of 198 m to a depth of 76.03 m and further on of 76 mm to the bottom of the borehole. The inclination of the borehole is –54.42°. The upper 76.03 m is cased with large diameter telescopic casing ranging from diameter (outer diameter) 210 mm–323 mm. A cone casing is placed from 73.15 m to 77.58 m ranging from diameter (outer diameter) 84 mm–104 mm.

The work was carried out in accordance with activity plan AP PS 400-07-007. In Table 1-1 controlling documents for performing this activity are listed. 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. Controlling documents for the performance of the activity.

Activity plan	Number	Version
Hydraulic pumping and injection tests in borehole KLX15A	AP PS 400-07-007	1.0
Method descriptions	**Number**	**Version**
Hydraulic injection tests	SKB MD 323.001e	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

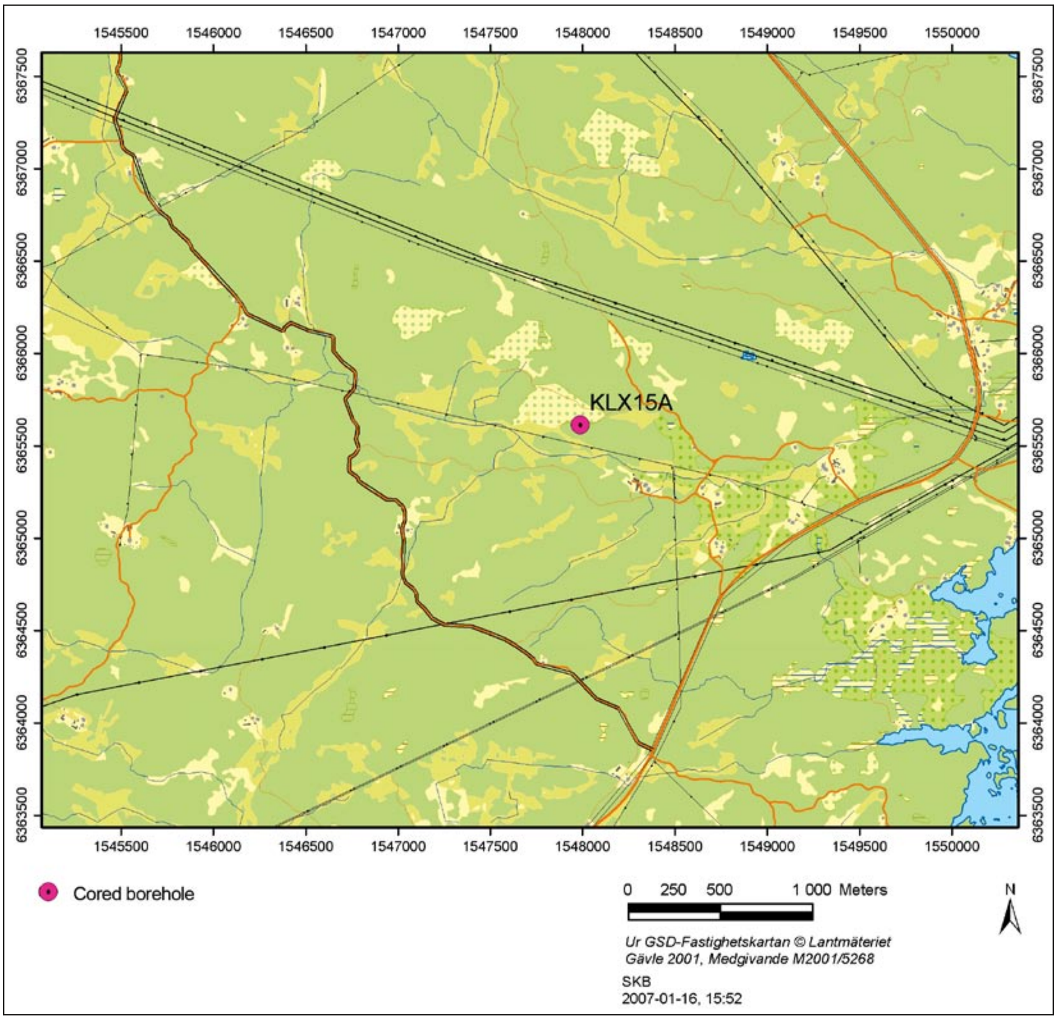


Figure 1-1. *The investigation area Laxemar, Oskarshamn with location of borehole KLX15A.*

2 Objective and scope

The objective of the hydrotests in borehole KLX15A 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.

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. Furthermore, a single packer test was conducted at a depth of 970.00 m to the bottom of the hole. The used single packer tool consists of a 5 m section but the lower packer was not connected to the pressure lines and therefore not inflated.

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 12^{th} and 28^{th} April 2007.

Between 480.00 m and 500.00 m, 520.00 m and 620.00 m, 640.00 m and 660.00 m, 680.00 m and 700.00 m, 820.00 m and 840.00 m and below of 880.00 m no 5 m tests were performed because the appropriate 20 m sections show a flow below measurement limit (1 mL/min). The position range of the 5 m tests were calculated for covering a true vertical depth of 300 m to 700 m with consideration of the borehole inclination of –54.42° and adapting to the next appropriate section limits of the 20 m sections.

2.1 Borehole

The borehole is telescope drilled with specifications on its construction according to Table 2-2. 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 borehole at the ground surface. The borehole diameter in Table 2-2 refers to the final diameter of the drill bit after drilling to full depth.

Table 2-1. Performed injection tests at borehole KLX15A.

No. of injection tests*	Interval	Positions	Time/test	Total test time
8	100 m	80.00–880.00 m	125 min	16.7 hrs
45	20 m	80.00–975.00 m	90 min	67.5 hrs
61	5 m	380.00–880.00 m	90 min	91.5 hrs
Single Packer**	30.43 m	970.00–1,000.43 m	90 min	1.5 hrs
Total:				177.2 hrs

* Excluding repeated tests.
** Conducted with a 5 m tool (bottom packer not inflated).

Table 2-2. Information about KLX15A (from SICADA 2007-03-28).

Title	Value				
Old idcode name(s):	KLX15A				
Comment:	No comment exists				
Borehole length (m):	1,000.43				
Reference level:	TOC				
Drilling period(s):	From date	To date	Secup (m)	Seclow (m)	Drilling type
	2006-12-21	2006-12-29	0.30	76.13	Percussion drilling
	2007-01-17	2007-02-25	76.13	1,000.43	Core drilling
Starting point coordinate:	Length (m)	Northing (m)	Easting (m)	Elevation (m.a.s.l.)	Coord system
(centerpoint of TOC)	0.00	6365614.168	1547987.466	14.590	RT90-RHB70
	3.00	6365612.516	1547986.903	12.150	RT90-RHB70
Angles:	Length (m)	Bearing	Inclination (– = down)		
	0.000	198.8263	–54.4246		RT90-RHB70
Borehole diameter:	Secup (m)	Seclow (m)	Hole diam (m)		
	0.30	6.00	0.341		
	6.00	11.65	0.233		
	11.65	76.03	0.198		
	76.03	76.13	0.165		
	76.13	76.71	0.086		
	76.71	77.58	0.086		
	77.58	1,000.43	0.076		
Core diameter:	Secup (m)	Seclow (m)	Core diam (m)		
	76.13	76.71	0.072		
	76.71	1,000.43	0.050		
Casing diameter:	Secup (m)	Seclow (m)	Case in (m)	Case out (m)	
	0.00	76.03	0.200	0.210	
	0.30	6.00	0.310	0.323	
Cone dimensions:	Secup (m)	Seclow (m)	Cone in (m)	Cone out (m)	
	73.15	76.15	0.100	0.104	
	76.15	77.85	0.080	0.084	
Grove milling:	Length (m)	Trace detectable			
	100.000	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			
	950.000	YES			
	980.000	YES			

2.2 Injection tests

Injection tests were conducted according to the Activity Plan AP PS 400-07-007 and the method description for hydraulic injection tests, SKB MD 323.001e (SKB internal documents). Tests were done in 100 m test sections between 80.00–880.00 m below ToC, in 20 m test sections between 80.00–975.00 m below ToC and in 5 m test sections between 380.00–880.00 m below ToC with the exception of the sections between 480.00 m–500.00 m, 520.00 m–620.00 m, 640.00 m –660.00 m, 680.00 m–700.00 m, 820.00 m–840.00 m and below of 880.00 m (see Table 2-3). The initial criteria for performing injection tests in 20 m and 5 m sections was a measurable flow of Q > 0.001 L/min in the previous measured 100 m and 20 m tests covering the smaller test sections (see Figure 2-1). An additional single packer test was performed from 970.00 m to the bottom of the borehole. The measurements were performed with SKBs custom made equipment for hydraulic testing called PSS2.

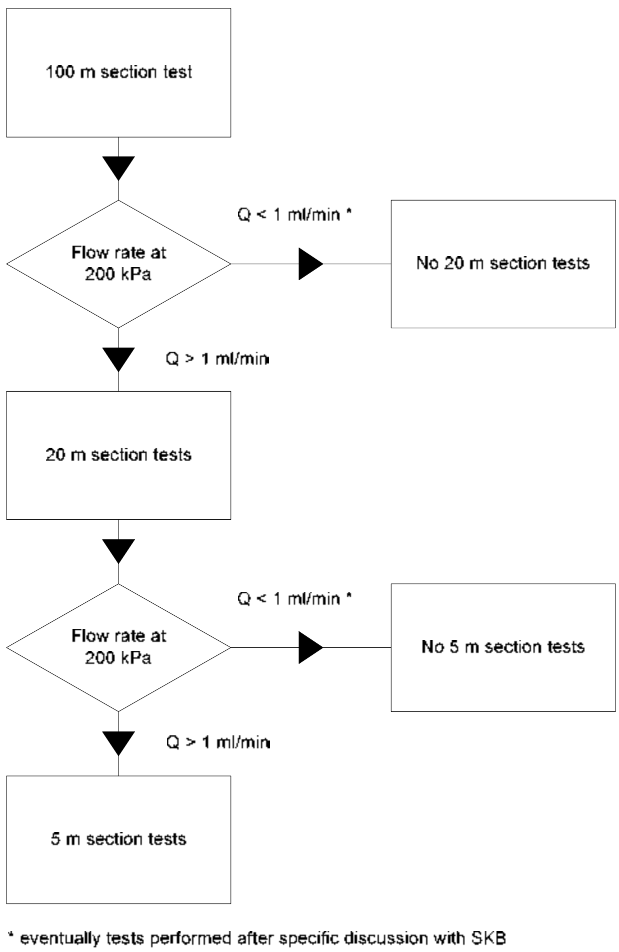


Figure 2-1. *Flow chart for test sections.*

Table 2-3. Tests performed.

Bh ID	Test section (m bToC)	Test type[1)]	Test no	Test start Date, Time	Test stop Date, Time
KLX15A	80.00–180.00	3	1	070412 07:48:00	070412 10:08:00
KLX15A	180.00–280.00	3	1	070412 13:56:00	070412 16:07:00
KLX15A	280.00–380.00	3	1	070412 17:54:00	070412 20:31:00
KLX15A	380.00–480.00	3	1	070412 22:07:00	070412 23:57:00
KLX15A	480.00–580.00	3	1	070413 06:20:00	070413 08:19:00
KLX15A	580.00–680.00	3	1	070413 10:28:00	070413 12:19:00
KLX15A	680.00–780.00	3	1	070413 15:02:00	070413 17:27:00
KLX15A	780.00–880.00	3	1	070413 19:23:00	070413 21:53:00
KLX15A	80.00–100.00	3	1	070414 19:23:00	070414 20:46:00
KLX15A	100.00–120.00	3	1	070414 22:09:00	070414 23:32:00
KLX15A	120.00–140.00	3	1	070415 00:09:00	070415 01:31:00
KLX15A	140.00–160.00	3	1	070415 07:52:00	070415 09:21:00
KLX15A	160.00–180.00	3	1	070415 10:15:00	070415 11:42:00
KLX15A	180.00–200.00	3	1	070415 12:35:00	070415 14:01:00
KLX15A	200.00–220.00	3	1	070415 14:59:00	070415 16:43:00
KLX15A	220.00–240.00	3	1	070415 17:16:00	070415 19:09:00
KLX15A	240.00–260.00	3	1	070415 19:47:00	070415 22:15:00
KLX15A	260.00–280.00	3	1	070415 22:53:00	070416 00:21:00
KLX15A	280.00–300.00	3	1	070416 00:56:00	070416 04:49:00
KLX15A	300.00–320.00	3	1	070416 06:46:00	070416 07:39:00
KLX15A	320.00–340.00	4B	1	070416 08:19:00	070416 10:26:00
KLX15A	340.00–360.00	3	1	070416 11:08:00	070416 11:57:00
KLX15A	360.00–380.00	3	1	070416 13:33:00	070416 15:03:00
KLX15A	380.00–400.00	3	1	070416 15:49:00	070416 17:16:00
KLX15A	400.00–420.00	3	1	070416 17:49:00	070416 19:13:00
KLX15A	420.00–440.00	3	1	070416 19:51:00	070416 20:47:00
KLX15A	440.00–460.00	3	1	070416 22:04:00	070416 23:37:00
KLX15A	460.00–480.00	3	1	070417 00:11:00	070417 05:32:00
KLX15A	480.00–500.00	3	1	070417 06:50:00	070417 07:38:00
KLX15A	500.00–520.00	3	1	070417 08:22:00	070417 09:52:00
KLX15A	520.00–540.00	3	1	070417 10:40:00	070417 11:29:00
KLX15A	540.00–560.00	3	1	070417 13:13:00	070417 14:02:00
KLX15A	560.00–580.00	3	1	070417 14:39:00	070417 15:28:00
KLX15A	580.00–600.00	3	1	070417 16:09:00	070417 16:42:00
KLX15A	580.00–600.00	3	2	070417 17:01:00	070417 17:56:00
KLX15A	600.00–620.00	3	1	070417 18:29:00	070417 19:23:00
KLX15A	620.00–640.00	3	1	070417 19:54:00	070417 21:59:00
KLX15A	640.00–660.00	4B	1	070417 22:57:00	070417 23:59:00
KLX15A	660.00–680.00	4B	1	070418 00:38:00	070418 05:25:00
KLX15A	680.00–700.00	3	1	070418 06:55:00	070418 07:46:00
KLX15A	700.00–720.00	3	1	070418 08:32:00	070418 10:34:00
KLX15A	720.00–740.00	3	1	070418 11:25:00	070418 13:21:00
KLX15A	740.00–760.00	3	1	070418 14:06:00	070418 16:13:00
KLX15A	760.00–780.00	3	1	070418 16:45:00	070418 18:35:00
KLX15A	780.00–800.00	3	1	070418 19:14:00	070418 22:09:00
KLX15A	800.00–820.00	3	1	070418 23:25:00	070419 01:11:00
KLX15A	820.00–840.00	3	1	070419 01:51:00	070419 02:43:00

Bh ID	Test section (m bToC)	Test type[1)]	Test no	Test start Date, Time	Test stop Date, Time
KLX15A	840.00–860.00	3	1	070419 07:59:00	070419 09:31:00
KLX15A	860.00–880.00	3	1	070419 10:19:00	070419 13:12:00
KLX15A	880.00–900.00	3	1	070419 14:46:00	070419 15:34:00
KLX15A	900.00–920.00	3	1	070419 16:30:00	070419 17:21:00
KLX15A	920.00–940.00	3	1	070419 17:52:00	070419 18:22:00
KLX15A	940.00–960.00	3	1	070419 20:42:00	070419 21:31:00
KLX15A	955.00–975.00	3	1	070419 22:03:00	070419 22:53:00
KLX15A	380.00–385.00	3	1	070421 12:18:00	070421 14:33:00
KLX15A	385.00–390.00	3	1	070421 15:06:00	070421 16:31:00
KLX15A	390.00–395.00	3	1	070421 16:56:00	070421 18:20:00
KLX15A	395.00–400.00	4B	1	070421 18:45:00	070421 20:28:00
KLX15A	400.00–405.00	3	1	070421 21:08:00	070421 22:31:00
KLX15A	405.00–410.00	3	1	070421 22:58:00	070421 23:47:00
KLX15A	410.00–415.00	3	1	070422 00:11:00	070422 01:33:00
KLX15A	415.00–420.00	3	1	070422 06:38:00	070422 07:26:00
KLX15A	440.00–445.00	3	1	070422 08:18:00	070422 10:14:00
KLX15A	445.00–450.00	3	1	070422 10:48:00	070422 11:37:00
KLX15A	450.00–455.00	3	1	070422 13:05:00	070422 14:33:00
KLX15A	455.00–460.00	3	1	070422 15:03:00	070422 16:45:00
KLX15A	460.00–465.00	3	1	070422 17:10:00	070422 18:37:00
KLX15A	465.00–470.00	3	1	070422 19:02:00	070422 20:50:00
KLX15A	470.00–475.00	3	1	070422 21:41:00	070422 23:12:00
KLX15A	475.00–480.00	3	1	070422 23:36:00	070423 00:24:00
KLX15A	500.00–505.00	3	1	070423 00:58:00	070423 02:17:00
KLX15A	505.00–510.00	3	1	070423 06:34:00	070423 07:23:00
KLX15A	510.00–515.00	3	1	070423 07:57:00	070423 08:45:00
KLX15A	515.00–520.00	3	1	070423 09:17:00	070423 10:05:00
KLX15A	620.00–625.00	3	1	070423 13:19:00	070423 14:08:00
KLX15A	623.00–628.00	3	1	070423 14:31:00	070423 16:01:00
KLX15A	628.00–633.00	3	1	070423 16:25:00	070423 17:57:00
KLX15A	630.00–635.00	3	1	070423 18:21:00	070423 19:41:00
KLX15A	635.00–640.00	3	1	070423 20:25:00	070423 22:02:00
KLX15A	660.00–665.00	3	1	070423 22:41:00	070423 23:30:00
KLX15A	665.00–670.00	3	1	070423 23:55:00	070424 01:02:00
KLX15A	670.00–675.00	3	1	070424 01:07:00	070424 01:55:00
KLX15A	675.00–680.00	3	1	070424 06:35:00	070424 07:25:00
KLX15A	700.00–705.00	3	1	070424 08:09:00	070424 08:58:00
KLX15A	705.00–710.00	3	1	070424 09:27:00	070424 12:06:00
KLX15A	710.00–715.00	3	1	070424 12:23:00	070424 13:15:00
KLX15A	715.00–720.00	3	1	070424 13:42:00	070424 14:31:00
KLX15A	720.00–725.00	3	1	070424 15:00:00	070424 15:49:00
KLX15A	725.00–730.00	3	1	070424 16:16:00	070424 17:04:00
KLX15A	730.00–735.00	3	1	070424 17:29:00	070424 18:18:00
KLX15A	735.00–740.00	3	1	070424 18:46:00	070424 20:38:00
KLX15A	740.00–745.00	4B	1	070424 21:17:00	070424 23:09:00
KLX15A	745.00–750.00	3	1	070424 23:35:00	070425 00:24:00
KLX15A	750.00–755.00	3	1	070425 00:48:00	070425 01:37:00
KLX15A	755.00–760.00	3	1	070425 06:31:00	070425 07:20:00

Bh ID	Test section (m bToC)	Test type[1)]	Test no	Test start Date, Time	Test stop Date, Time
KLX15A	760.00–765.00	3	1	070425 07:45:00	070425 08:33:00
KLX15A	765.00–770.00	4B	1	070425 09:00:00	070425 10:53:00
KLX15A	770.00–775.00	3	1	070425 13:20:00	070425 17:15:00
KLX15A	775.00–780.00	3	1	070425 17:38:00	070425 19:01:00
KLX15A	780.00–785.00	4B	1	070425 19:31:00	070425 21:08:00
KLX15A	785.00–790.00	3	1	070425 21:31:00	070425 22:19:00
KLX15A	790.00–795.00	3	1	070425 22:42:00	070426 00:12:00
KLX15A	795.00–800.00	3	1	070426 00:40:00	070426 01:26:00
KLX15A	800.00–805.00	3	1	070426 06:31:00	070426 07:20:00
KLX15A	805.00–810.00	3	1	070426 12:24:00	070426 13:13:00
KLX15A	810.00–815.00	3	1	070426 13:40:00	070426 15:11:00
KLX15A	815.00–820.00	3	1	070426 15:35:00	070426 16:24:00
KLX15A	840.00–845.00	3	1	070426 17:00:00	070426 18:41:00
KLX15A	845.00–850.00	3	1	070426 19:05:00	070426 20:28:00
KLX15A	850.00–855.00	3	1	070426 21:12:00	070426 22:01:00
KLX15A	855.00–860.00	3	1	070426 22:24:00	070426 23:47:00
KLX15A	860.00–865.00	3	1	070427 00:09:00	070427 01:16:00
KLX15A	865.00–870.00	3	1	070427 01:20:00	070427 03:30:00
KLX15A	870.00–875.00	3	1	070427 06:28:00	070427 07:17:00
KLX15A	875.00–880.00	3	1	070427 07:43:00	070427 08:23:00
KLX15A	970.00–1,000.43	3	1	070428 10:58:00	070428 13:52:00

[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 KLX15A were conducted.

2.3 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 respectively prior to every test performance.

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”.

3 Equipment

3.1 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.

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.

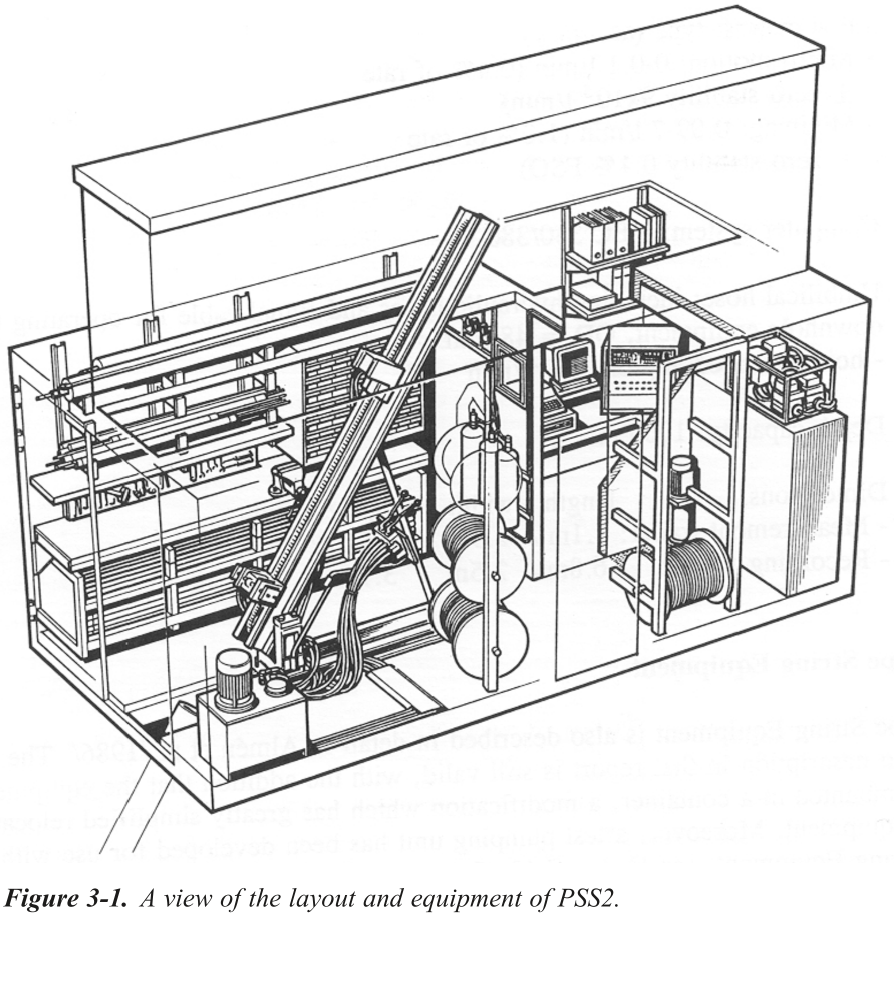


Figure 3-1. *A view of the layout and equipment of PSS2.*

Photo 1. *Hydraulic rig.*

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

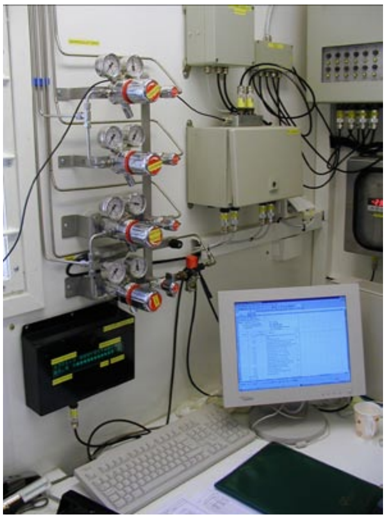


Photo 3. *Computer room, displays and gas regulators.*

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

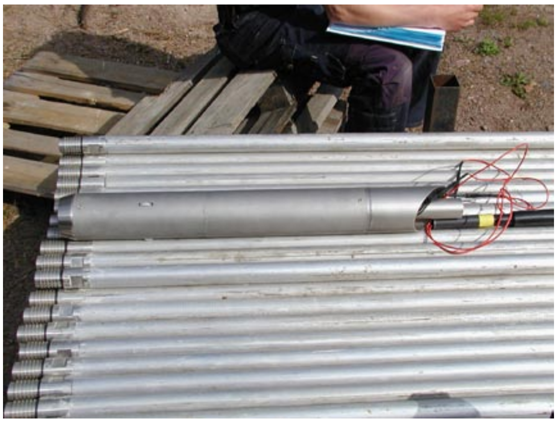


Photo 5. *Positioner, bottom end of down-in-hole string.*

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–50L/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 3-2.

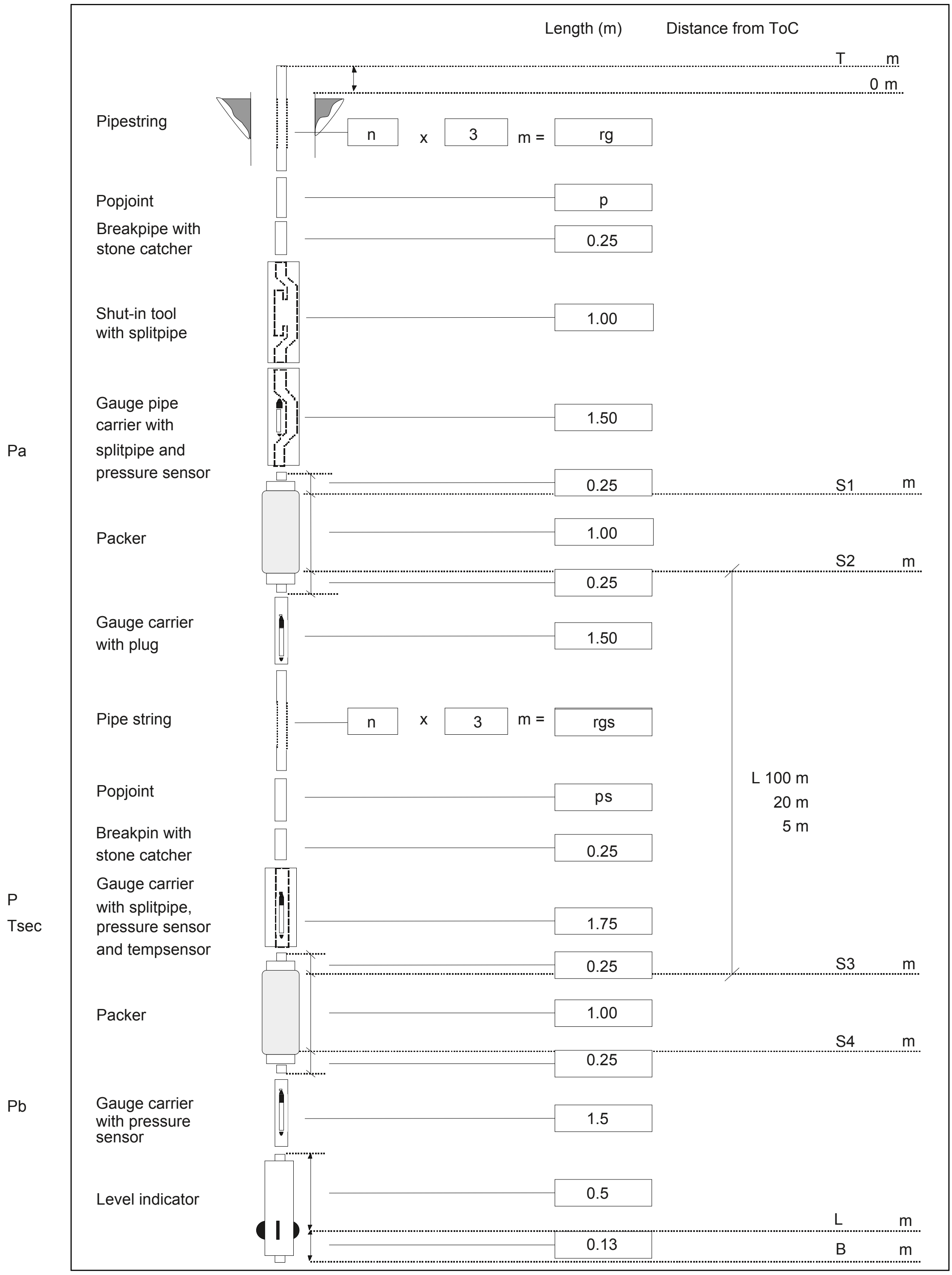


Figure 3-2. *Schematic drawing of the down-hole equipment in the PSS2 system.*

3.2 Sensors

Table 3-1. 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 3-2. Sensor positions and wellbore storage (WBS) controlling factors.

Borehole information		Sensors		Equipment affecting WBS coefficient			
ID	Test section (m)	Type	Position (m fr ToC)	Position	Function	Outer diameter (mm)	Net water volume in test section (m³)
KLX15A	80.00–180.00	p_a p T p_b L	78.00 179.13 178.96 182.00 183.25	Test section	Signal cable Pump string Packer line	9.1 33 6	0.359
KLX15A	80.00–100.00	p_a p T p_b L	78.00 99.13 98.96 102.00 103.25	Test section	Signal cable Pump string Packer line	9.1 33 6	0.072
KLX15A	380.00–385.00	p_a p T p_b L	378.00 384.13 383.96 387.00 388.25	Test section	Signal cable Pump string Packer line	9.1 33 6	0.018
KLX15A	970.00–1,000.43	p_a p T p_b L	968.00 974.13 973.96 977.00 978.25	Test section	Signal cable Pump string Packer line	9.1 33 6	0.109

3.3 Data acquisition system

The data acquisition system in the PSS2 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 3-3.

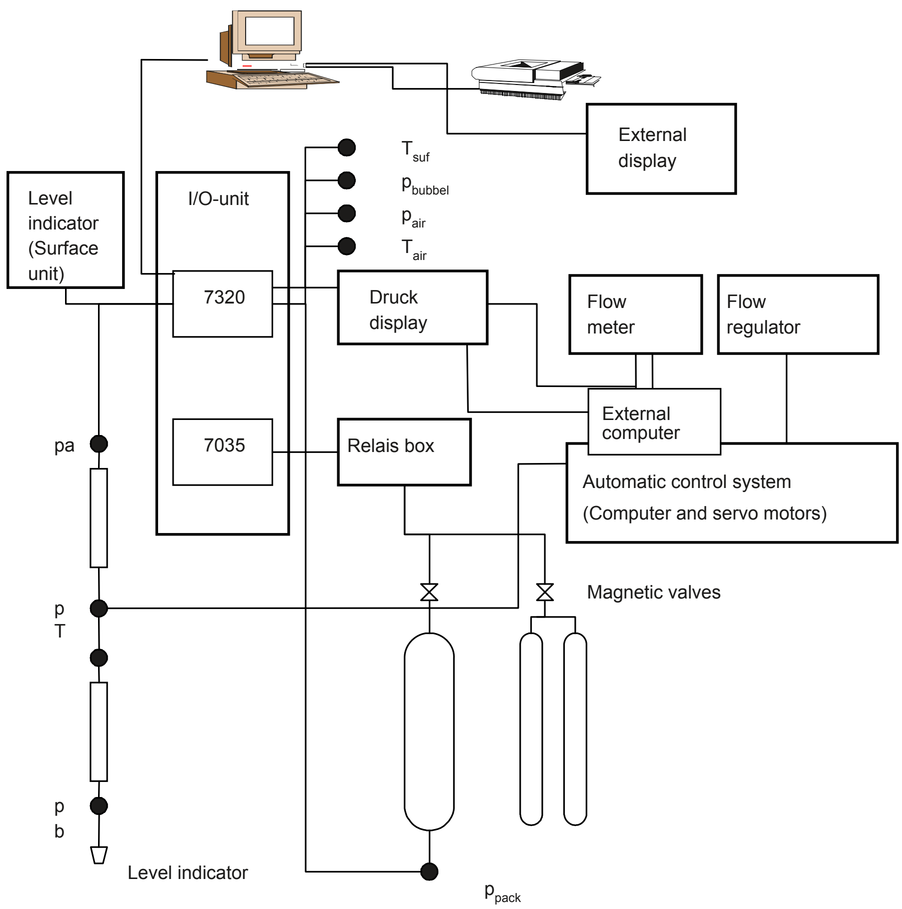


Figure 3-3. *Schematic drawing of the data acquisition system and the flow regulation control system in PSS2.*

4 Execution

4.1 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 disinfect of Multikabel and hoses for packer and test valve. Clean the tubings with hot steam.
- Filling injection tank with water out of the borehole HLX14.
- Filling buffer tank with water and tracer it with Uranin; take water sample.
- 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.

4.2 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 these groves are given by SKB in the activity plan (see Table 2-2) 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 test sections to avoid wrong placements and minimize elongation effects of the test string.

4.3 Execution of field work

4.3.1 Test principle

The test design consisted of a preliminary pulse injection test (Pi) 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. Regularly the CHi and CHir phases were analysed quantitatively, in cases of very low section transmissivity, the Pi phase was analysed.

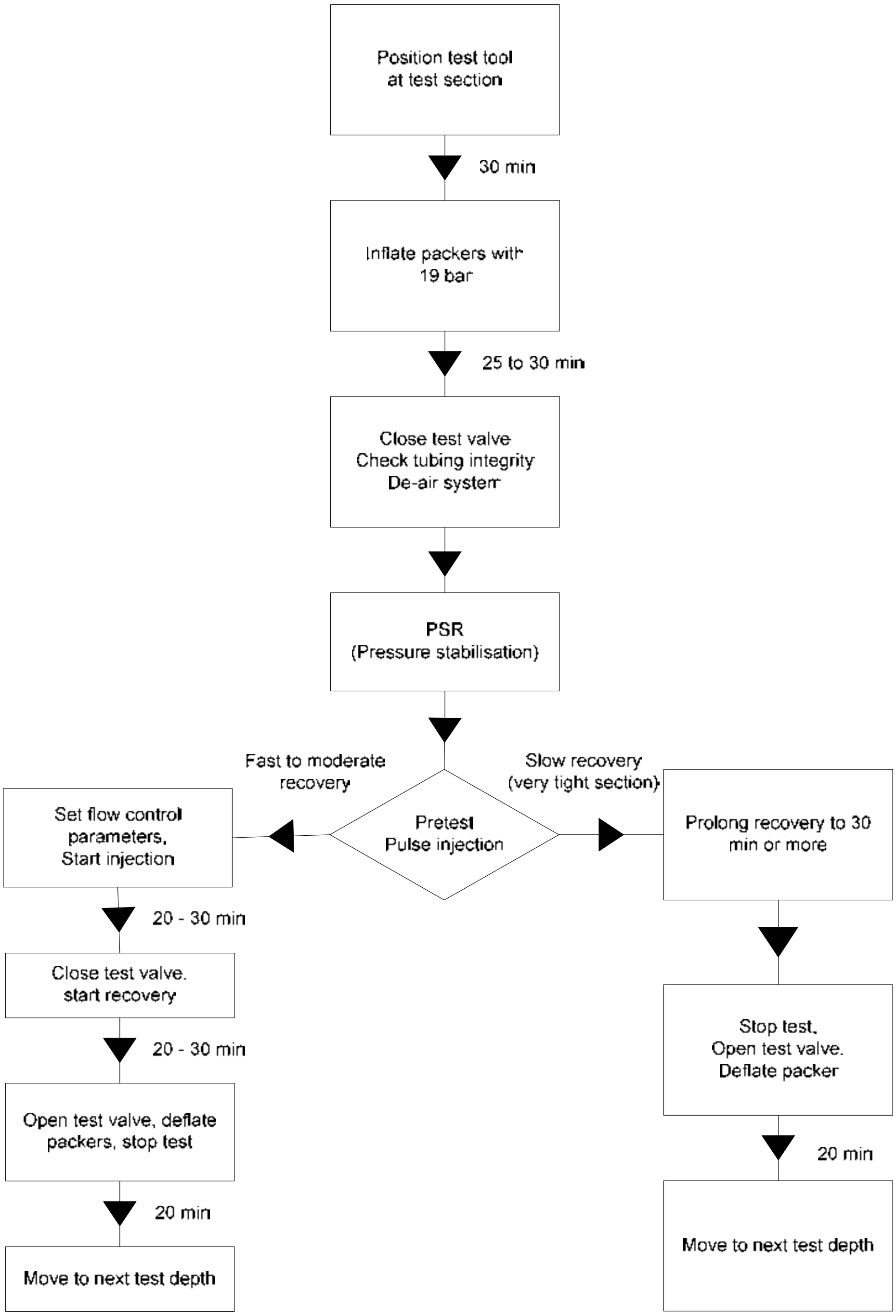


Figure 4-1. *Flow chart for test performance.*

4.3.2 Test procedure

A typical test cycle includes the following phases: 1) Transfer of down-hole equipment to the next section. 2) Packer inflation. 3) Pressure stabilisation. 4) Preliminary Pulse injection. 5) Constant head injection. 6) Pressure recovery. 7) Packer deflation.

The preliminary pulse injection (Step 4) derives the first estimations of the formation transmissivity. It is conducted by applying a pressure difference of approx. 200 kPa to the static formation pressure. If the pulse recovery indicates a very low transmissivity (flow probably below 1 mL/min) the pulse recovery is prolonged and no constant head injection test is performed. The decision to continue the pulse or to conduct an injection test is based on the pressure response of the pulse recovery. A pressure recovery less than 50 % during the first ten minutes of the pulse indicates a low transmissivity. In such a case no injection test will be conducted.

The pressure static recovery (PSR) after packer inflation and before the pulse gives a direct measure of the magnitude of the packer compliance. A steep PSR indicates extremely low test section transmissivity. In such a case the packer compliance would influence the subsequent pulse test too much and introduce very large uncertainties. Therfore tests with this behaviour would be stopped after PSR phase.

If the preliminary pulse injection test indicates a formation transmissivity with a flow above 1 mL/min a constant head injection test (Step 5 and 6) is carried out. It is applied with a constant injection pressure of approx. 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 is measured. In cases, where small flow rates were expected, the automatic regulation unit was switched off and the test was performed manually (determined by the preliminary pulse injection). In those cases, the constant difference pressure was usually unequal but close to 200 kPa.

In cases when the derived transmissivity of a test section influences the subsequent test program the constant head injection was conducted even if the preliminary pulse indicates a very tight section (e.g. flow below 1 mL/min). The injection phase is then performed to verify the results of the pulse.

The duration for each phase is presented in Table 4-1.

Table 4-1. Durations for packer inflation, pressure stabilisation, injection and recovery phase and packer deflation.

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

* Step 5 and 6 conducted if the preliminary pulse indicates a formation transmissivity with a sufficient flow.

4.4 Data handling/post processing

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 consistency reviews.

4.5 Analyses and interpretations

4.5.1 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.

4.5.2 Analysis approach

Constant pressure tests are analysed using a rate inverse approach. The method initially known as the Jacob-Lohman method /Jacob and Loman 1952/ 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.

Pulse tests are analysed by using the pressure deconvolution method described by /Peres et al. 1989/ with improvements introduced by /Chakrabarty and Enachescu 1997/.

4.5.3 Analysis methodology

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

- **Injection Tests**
- Identification of the flow model by evaluation of the derivative on the log-log diagnostic plot. 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.

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

- **Pre-test for the Injection Tests**

The test cycle always starts with a pulse injection phase with the aim of deriving a first estimation of the formation transmissivity. In cases when the pulse recovery is low (indicating low transmissivity) the pulse phase is extended and analysed as the main phase for the test.

The transmissivity derived from a pulse test is strongly influenced by the wellbore storage coefficient used as an input in the analysis. The wellbore storage coefficient is calculated as C = dV/dP where dV is the volume difference injected during the brief flow period of the pulse and dP is the initial pressure difference of the pulse. dV is directly measured either by using the flowmeter readings or water level measurements in the injection vessel.

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 4-2 below shows an example of a typical pressure versus time evolution for such a tight section.

- Flow model identification 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. An example of type curves is presented in Figure 4-3.

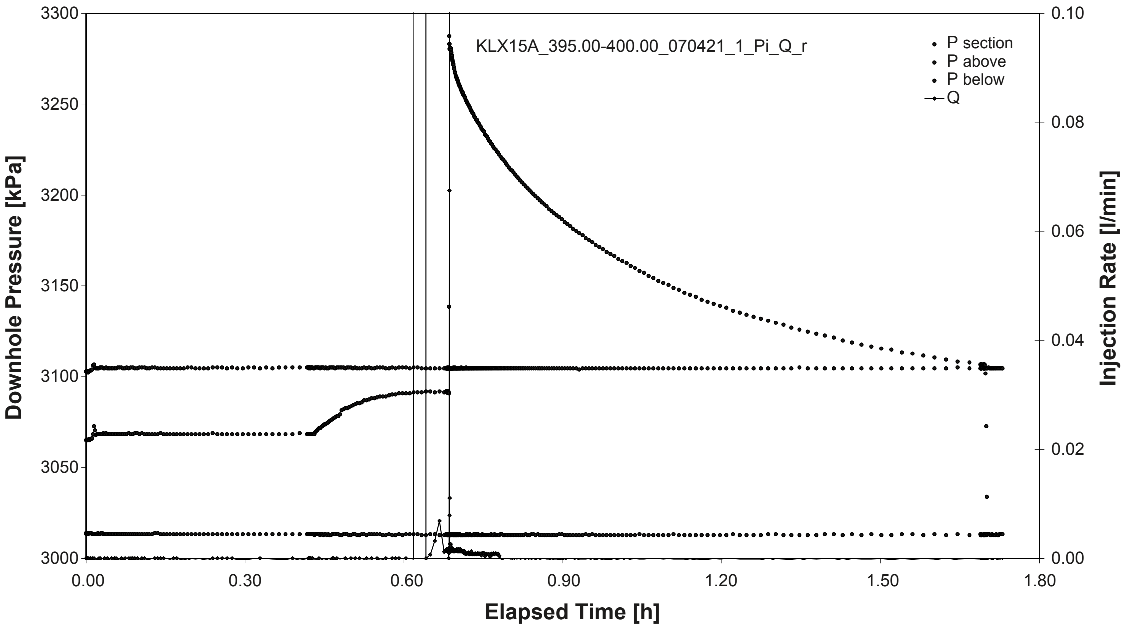


Figure 4-2. *Typical pressure versus time plot of a Pulse injection test.*

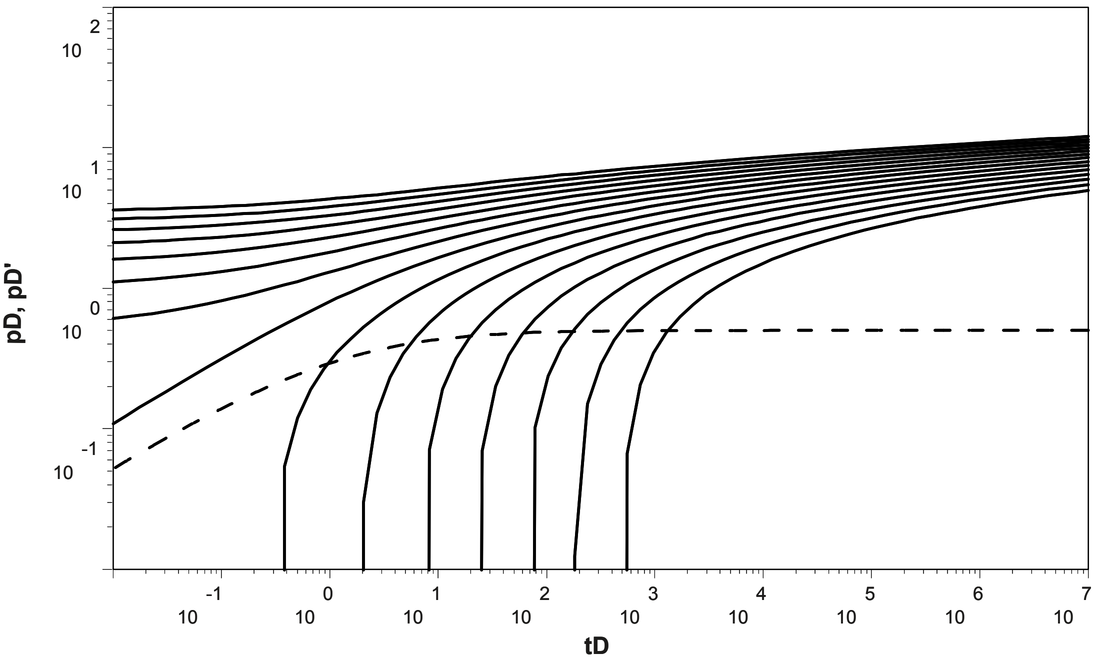


Figure 4-3. Deconvolution type curve set for pulse test analysis.

4.5.4 Correlation between storativity and skin factor

For the analysis of the conducted hydraulic tests below 100 m depth a storativity of $1 \cdot 10^{-6}$ and for hydraulic tests above 100 m a storativity of $1 \cdot 10^{-3}$ is assumed (SKB MD 320.004e). Based on this assumption the skin will be calculated. In the following the correlation between storativity and skin for the relevant test phases will be explained in greater detail.

- **Injection phase (CHi) / Pulse tests (Pi)**

Due to the fact that the early time data of the CHi and Pi phases, respectively, is not available or too noisy (attributed to the automatic regulation system) the storativity and the skin factor become correlated. Consequently they cannot be solved independently any more. In this case as a result of the analysis one determines the correlation group $e^{2\xi}/S$. This means that in such cases the skin factor can only be calculated when assuming the storativity as known.

- **Recovery phase (CHir)**

The wellbore storage coefficient (C) is determined by matching the early time data with the corresponding type curve. The derived C-value is introduced in the equation of the type curve parameter:

$$(C_D e^{2\xi})_M = \frac{C \rho g}{2\pi r_w^2 S} e^{2\xi}$$

The equation above has two unknowns, the storativity (S) and the skin factor (ξ) which expresses the fact that for the case of constant rate and pressure recovery tests the storativity and the skin factor are 100% correlated. Therefore, the equation can only be either solved for skin by assuming that the storativity is known or solved for storativity by assuming the skin as known.

4.5.5 Determination of the ri-index and calculation of the radius of influence (ri)

The analysis provides also the radius of influence and the ri-index, which describes the late time behaviour of the derivative.

Ri-index

The determination of the ri-index is based on the shape of the derivative plotted in log-log coordinates and describes the behaviour of the derivative after the time t_2, representing the end of the near wellbore response. The ri-index also describes the flow regime at the end of the test. Following ri-indices can be assigned:

- ri-index = 0: The middle and late time derivative shows a horizontal stabilization. This pressure response indicates that the size of the hydraulic feature is greater than the radius of influence. The calculated radius of influence is based on the entire test time t_P.
- ri-index = 1: The derivative shows an upward trend at late times, indicating a decrease of transmissivity or a barrier boundary at some distance from the borehole. The size of the hydraulic feature near the borehole is estimated as the radius of influence based on t_2.
- ri-index = –1: The derivative shows a downward trend at late times, indicating an increase of transmissivity or a constant head boundary at some distance from the borehole. The size of the hydraulic feature near the borehole is estimated as the radius of influence based on t_2.

Figure 4-4 presents the relationship between the shape of derivative and the ri-index.

If no radial flow stabilization can be observed the ri-index is based on the flow regime at the end of the test: i.e. ri-index = 1 for tests with a derivative showing an upward trend at the end and a ri-index = –1 for tests with a derivative showing a downward trend. In such cases the calculated radius of influence is based on the entire test time t_P.

The assignment of the ri-index is based on /Rhen 2005/.

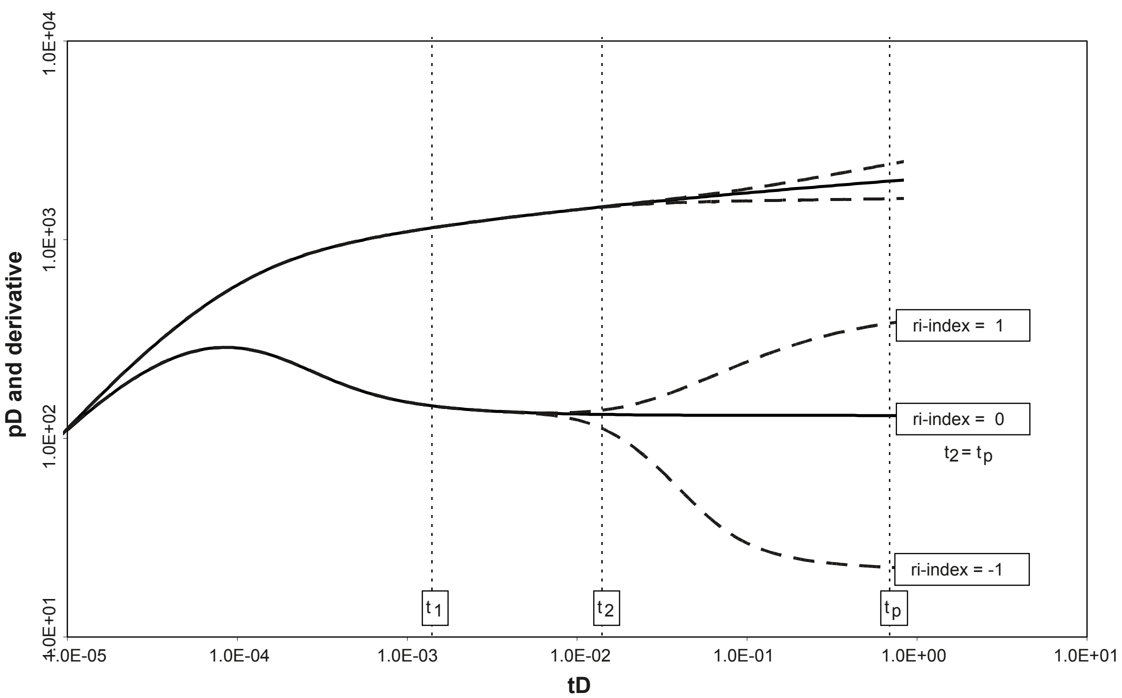


Figure 4-4. Schematic plot of the assignments for the ri-indices.

Calculation of the radius of influence

The radius of influence (ri) is calculated as follows:

$$ri = 1.89 * \sqrt{\frac{T_T}{S_T} * t_2} \text{ [m]}$$

T_T recommended inner zone transmissivity [m²/s]

t_2 time when hydraulic formation properties changes (see previous chapter) [s]

S_T for the calculation of the ri the storage coefficient (S) is estimated from the transmissivity /Rhen et al. 2006/:

$S_T = 0.0007 * T_T^{0.5}$ [–]

4.5.6 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/.

4.5.7 Flow models used for 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.

In several cases the pressure derivative suggests a change of transmissivity 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.

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. At tests where a flow regime could not clearly identified from the test data, a radial flow regime was assumed as the most simple flow model available. The value of p* was then calculated according to this assumption.

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.

4.5.8 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 atmospheric pressure measured by the surface gauge and corrected for the vertical depth considering the inclination of the drill hole, by assuming a water density of 1,000 kg/m³ (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 4-5 shows the methodology schematically.

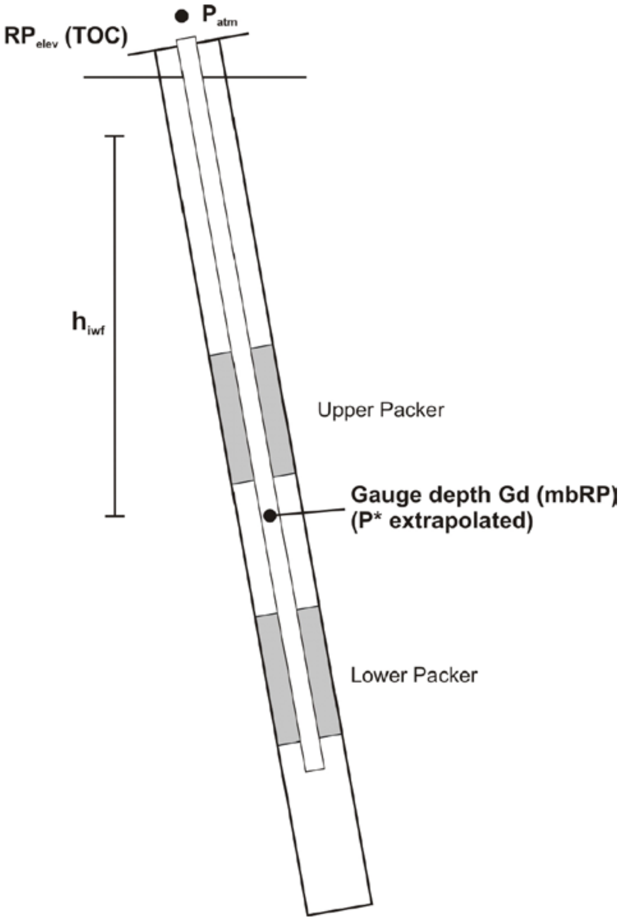


Figure 4-5. *Schematic methodologies for calculation of the freshwater head.*

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:

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

4.5.9 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.

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.

4.6 Nonconformities

After performing the 100 m test sections it was observed that the level indicator gives no signal any more by passing the grove millings when running in for the 20 m and 5 m section tests. As the relevant correction values were already documented from the 100 m section tests, these correction values were used for the 20 m and 5 m section tests accordingly.

Malfunctions of the pressure transducer at position Pa (pressure above test section) and of the temperature sensor were observed. As these values are of minor importance for the evaluation of the performed injection tests, it was agreed by SKB to proceed with the testing programme.

5 Results

In the following, results of all tests are presented and analysed. Section 5.1 present the 100 m tests, 5.2 the 20 m tests, 5.3 the 5 m tests and 5.4 the single packer test. The results are given as general comments to test performance, the identified flow regimes and calculated parameters and finally the parameters which are considered as most representative are chosen and justification is given. All results are also summarised in Table 6-1 and 6-2 of the Summary chapter. In addition, the results are presented in Appendices 3 and 5.

The results are stored in the primary data base (SICADA). The SICADA data base contains data that will be used for further interpretation (modelling). The data are traceable in SICADA by the Activity plan number (AP PS 400-07-007; SKB controlling document).

5.1 100 m single-hole injection tests

In the following, the 100 m section tests conducted in borehole KLX15A are presented and analysed.

5.1.1 Section 80.00–180.00 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 pressure response and the 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 with a pressure difference of 36 kPa. No hydraulic connection to the adjacent sections was observed during the CHi phase. The injection rate decreased from 54.4 L/min at start of the CHi phase to 26.5 L/min at the end, indicating a high interval transmissivity (consistent with the pulse recovery). The CHir phase shows relatively fast recovery, but it is still amenable for quantitative analysis.

Flow regime and calculated parameters

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 shows a derivative with a horizontal stabilization at middle and late times, indicating radial flow. The CHi phase was analysed using an infinite acting homogeneous radial flow model. Due to the fast recovery the derivative is not very conclusive. For the analysis of the CHir phase a homogeneous radial flow model with wellbore storage and skin was chosen. The analysis is presented in Appendix 2-1.

Selected representative parameters

The recommended transmissivity of $7.7 \cdot 10^{-5}$ m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $3.0 \cdot 10^{-5}$ m^2/s to $3.0 \cdot 10^{-4}$ m^2/s. The flow dimension displayed during the test was 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 1,407.6 kPa.

Both phases show a good consistency. No further analysis is recommended.

5.1.2 Section 180.00–280.00 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 pressure response and 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 with a pressure difference of 201 kPa. No hydraulic connection to the adjacent sections was observed during the CHi phase. The injection rate decreased from 26.4 L/min at start of the CHi phase to 7.7 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.

Flow regime and calculated parameters

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 shows a horizontal stabilization at middle times, followed by a downward trend at late times, indicating an increase of transmissivity at some distance from the borehole. The CHi phase was analysed using a radial composite flow model. The CHir phase shows a unit downward trend at middles times indicating a positive skin, followed by a slight horizontal stabilisation at late times. For the analysis of the CHir phase a homogeneous radial flow model with wellbore storage and skin was chosen. This homogenous model with positive skin is consistent with the composite model used for the CHi phase. The analysis is presented in Appendix 2-2.

Selected representative parameters

The recommended transmissivity of $1.4 \cdot 10^{-5}$ m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-6}$ m^2/s to $3.0 \cdot 10^{-5}$ m^2/s. The flow dimension displayed during the test was 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 2,157.8 kPa.

The analysis of the CHi and CHir phases shows good consistency. No further analysis is recommended.

5.1.3 Section 280.00–380.00 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 moderate to 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 injection rate decreased, after initial oscillations induced by the regulation unit, from 22 mL/min at start of the CHi phase to 17 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). After the oscillations the regulation unit worked well. However, the recorded flow rate is noisy. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a noisy but relative flat derivative at middle and late times, indicating radial flow. The CHi phase was analysed using an infinite acting homogeneous radial flow model. The derivative of the CHir phase shows a downward trend at middle and late times. This is indicative for a transition from wellbore storage and skin dominated flow to pure formation flow. The CHir phase was analysed using a homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-3.

Selected representative parameters

The recommended transmissivity of $1.9 \cdot 10^{-8}$ m^2/s was derived from the analysis of the CHi phase, which shows a horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-9}$ m^2/s to $6.0 \cdot 10^{-8}$ m^2/s. The flow dimension displayed during the test is 2. 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 2,916.3 kPa.

Apart from the high positive skin derived from the CHir phase, the analyses of both phases show consistency. No further analysis is recommended.

5.1.4 Section 380.00–480.00 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 high to moderate 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 5.82 L/min at start of the CHi phase to 1.92 L/min at the end, indicating a medium to high interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a clear horizontal stabilisation at middle and late times, indicating radial flow. The CHi phase was analysed using an infinite acting homogeneous radial flow model. Similar to the CHi phase, the CHir phase shows a horizontal derivative at middle times. The CHir phase was analysed using a homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-4.

Selected representative parameters

The recommended transmissivity of $2.8 \cdot 10^{-6}$ m^2/s was derived from the analysis of the CHir phase, because it shows the best derivative stabilisation. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-5}$ m^2/s to $5.0 \cdot 10^{-6}$ m^2/s. The flow dimension displayed during the test is 2. 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 3,657.5 kPa.

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

5.1.5 Section 480.00–580.00 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 moderate 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 18 mL/min at start of the CHi phase to 14 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The regulation unit worked well, but the recorded flow rate is noisy. The CHir phase recovered very fast, which adds uncertainty to the derivative analysis. The results should be regarded as order of magnitude only.

Flow regime and calculated parameters

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 shows a noisy derivative. However, the CHi phase was analysed using an infinite acting homogeneous radial flow model. The derivative of the CHir phase shows a steep downward trend at middle times, which is consistent with a relative high positive skin factor. The late time derivative is not very conclusive. The CHir phase was matched using a homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-5.

Selected representative parameters

The recommended transmissivity of $2.9\cdot10^{-7}$ m^2/s was derived from the analysis of the CHi phase, which shows the slight better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $3.0\cdot10^{-8}$ m^2/s to $7.0\cdot10^{-7}$ m^2/s. The flow dimension is assumed to be 2. 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 4,403.1 kPa.

No further analysis is recommended.

5.1.6 Section 580.00–680.00 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 moderate 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 197 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 2.81 L/min at start of the CHi phase to 0.82 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.

Flow regime and calculated parameters

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 shows an downward slope at middle times and a slight horizontal stabilisation at late times, indicating an increase of transmissivity at some distance from the borehole. With the exception of the slight stabilisation at late times, the derivative of the CHir phase is consistent to the CHi phase. Therefore a two shell composite radial flow model for the CHi phase and a composite radial flow model with wellbore storage and skin for the analysis of the CHir phase were chosen. The analysis is presented in Appendix 2-6.

Selected representative parameters

The recommended transmissivity of $1.5 \cdot 10^{-7}$ m^2/s was derived from the analysis of the CHir phase (inner zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-7}$ m^2/s to $3.0 \cdot 10^{-6}$ m^2/s. The flow dimension displayed during the test is 2. 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 5,145.1 kPa.

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

5.1.7 Section 680.00–780.00 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 moderate to 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 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased, after initial oscillations induced by the control unit, from 79 mL/min at start of the CHi phase to 31 mL/min at the end, indicating a middle to low interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a derivative with an upward slope at middle and late times. The CHi phase was analysed using a two shell composite radial flow model with a decreasing transmissivity at some distance to the borehole. The CHir phase shows a horizontal stabilisation at early times followed by an upward trend at middle and late times times. 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 2-7.

Selected representative parameters

The recommended transmissivity of $2.2 \cdot 10^{-8}$ m^2/s was derived from the analysis of the CHir phase (inner zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-9}$ m^2/s to $5.0 \cdot 10^{-8}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, could not be extrapolated from the CHir phase due to the very low outer zone transmissivity.

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

5.1.8 Section 780.00–880.00 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 moderate to 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 196 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased, after initial oscillations induced by the control unit, from 71 mL/min at start of the CHi phase to 39 mL/min at the end, indicating a middle to low interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 noisy but shows a horizontal stabilisation at middle and late times, indicating radial flow. The CHi phase was analysed using an infinite acting homogeneous radial flow model with. The late derivative of the CHir phase is consistent with the CHi phase. It shows a horizontal stabilisation, indicating radial flow. A homogenous 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.

Selected representative parameters

The recommended transmissivity of $3.7 \cdot 10^{-8}$ m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-8}$ m^2/s to $8.0 \cdot 10^{-8}$ m^2/s. The flow dimension displayed during the test is 2. 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 6,601.3 kPa.

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

5.2 20 m single-hole injection tests

In the following, the 20 m section tests conducted in borehole KLX15A are presented and analysed.

5.2.1 Section 80.00–100.00 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 moderate 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 5.23 L/min at start of the CHi phase to 3.19 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.

Flow regime and calculated parameters

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 stabilisation at early and middle times and a downward trend without horizontal stabilisation at late times. The Chi phase was matched using a radial flow composite model. The derivative of the CHir phase is consistent with the CHi derivative, with the exception of a continuously downward trend at late times. A radial composite flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-9.

Selected representative parameters

The recommended transmissivity of $2.9 \cdot 10^{-6}$ m^2/s was derived from the analysis of the CHi phase (inner zone), which shows the best horizontal stabilisation and derivative quality. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-7}$ m^2/s to $8.0 \cdot 10^{-6}$ m^2/s. The flow dimension displayed during the test is 2. 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 801.0 kPa.

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

5.2.2 Section 100.00–120.00 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 moderate 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, after initial oscillations induced by the regulation unit, from 4.1 L/min at start of the CHi phase to 2.94 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.

Flow regime and calculated parameters

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 downward slope at middle times, which finally tends to horizontal stabilisation at late time. The CHi phase was analysed using a radial flow composite model with an increasing transmissivity at some distance of the borehole. The behaviour of the CHir phase is consistent with the CHi phase, but the clear horizontal stabilisation is not visible. A radial composite flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-10.

Selected representative parameters

The recommended transmissivity of $4.1 \cdot 10^{-6}$ m^2/s was derived from the analysis of the CHir phase (inner zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-6}$ m^2/s to $2.0 \cdot 10^{-5}$ m^2/s. The flow dimension displayed during the test is 2. 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 950.5 kPa.

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

5.2.3 Section 120.00–140.00 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 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 32 kPa. A hydraulic connection between test interval and bottom zone (the pressure rose by 4 kPa) was observed. The injection rate decreased, after initial oscillations induced by the control unit, from 44.3 L/min at start of the CHi phase to 25.9 L/min at the end, indicating a high interval transmissivity (consistent with the pulse recovery). The shunt valve was adjusted during the injection phase to control the pressure in the regulation system. Because of this the regulation unit was not able to maintain stable flow conditions. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a noisy derivative and does not allow flow model identification. The CHi phase was analysed using a homogenous radial flow model. However, the CHir phase shows a horizontal stabilisation at middle times and an upward 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 2-11.

Selected representative parameters

The recommended transmissivity of $1.1 \cdot 10^{-4}$ m^2/s was derived from the analysis of the CHir phase (inner zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $3.0 \cdot 10^{-5}$ m^2/s to $3.0 \cdot 10^{-4}$ m^2/s. The flow dimension displayed during the test is 2. 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 1,105.9 kPa.

The 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 relatively good consistency. No further analysis is recommended.

5.2.4 Section 140.00–160.00 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 moderate 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 5.9 L/min at start of the CHi phase to 2.7 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.

Flow regime and calculated parameters

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 downward slope at middle times, which a horizontal stabilisation at late time. The CHi phase was analysed using a radial flow composite model with an increasing transmissivity at some distance of the borehole. The derivative of the CHir phase is consistent with the CHi derivative. A radial composite flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-12.

Selected representative parameters

The recommended transmissivity of $3.6·10^{-6}$ m²/s was derived from the analysis of the CHi phase (outer zone), which shows a clear horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $8.0·10^{-7}$ m²/s to $3.0·10^{-5}$ m²/s, which encompasses the derived outer and inner zone transmissivities of the CHi and CHir phases. The flow dimension displayed during the test is 2. 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 1,256.9 kPa.

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

5.2.5 Section 160.00–180.00 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 moderate to 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 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased, after initial oscillations induced by the control unit, from 0.16 L/min at start of the CHi phase to 0.11 L/min at the end, indicating a medium to low interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 quite noisy throughout the test phase. An average of the derivative can be considered as horizontal stabilisation, indicating radial flow. The CHi phase was analysed using a homogeneous radial flow model. The derivative of the CHir phase shows wellbore storage and skin dominated flow without reaching horizontal stabilisation. 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 2-13.

Selected representative parameters

The recommended transmissivity of $1.4·10^{-7}$ m²/s was derived from the analysis of the CHi phase, which shows the best horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $7.0·10^{-8}$ m²/s to $6.0·10^{-7}$ m²/s. The flow dimension displayed during the test is 2. 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 1,408.5 kPa.

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

5.2.6 Section 180.00–200.00 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 moderate 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, after initial oscillations induced by the control unit, from 2.46 L/min at start of the CHi phase to 0.97 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). At middle and late times the regulation unit functioned well, but the recorded data is noisy. The CHir phase recovered very fast, which influences the quality of the early time data.

Flow regime and calculated parameters

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 downward slope at middle times. At late times the derivative is noisy, but trends to horizontal stabilisation indicating radial flow. The CHi phase was analysed using a radial composite flow model with increasing transmissivity at some distance from the borehole. The derivative was matched using a homogeneous radial flow model with wellbore storage and skin, which is consistent with the high positive skin factor. The analysis is presented in Appendix 2-14.

Selected representative parameters

The recommended transmissivity of $1.6·10^{-6}$ m^2/s was derived from the analysis of the CHi phase (outer zone), which shows a better horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $2.0·10^{-7}$ m^2/s to $5.0·10^{-6}$ m^2/s. The flow dimension displayed during the test is 2. 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 1,561.9 kPa.

The analyses of the CHi and CHir phases show inconsistency, concerning the chosen flow models. If further analysis is planned, a total test simulation should help to solve the inconsistency.

5.2.7 Section 200.00–220.00 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 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 200 kPa. No hydraulic connection to the adjacent zones was observed. 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). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 bit noisy, due to the low flow rates, but shows a horizontal stabilisation, indicating radial flow. The CHi phase was analysed using an infinite acting homogeneous radial flow model. The derivative of the CHir phase shows a downward trend at late times and is still influenced by wellbore storage and skin dominated 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 2-15.

Selected representative parameters

The recommended transmissivity of $2.6 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHi phase, which shows a horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-10}$ m^2/s to $5.0 \cdot 10^{-9}$ m^2/s. The flow dimension displayed during the test is 2. 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 1,700.2 kPa.

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

5.2.8 Section 220.00–240.00 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 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 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 14 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). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 downward slope at early and middle times and tends to horizontal stabilisation at late times. The CHi phase was analysed using a two shell composite radial flow model with an increasing transmissivity at some distance to the borehole. Similar to the CHi phase, the CHir phase shows a downward trend at middle times but no clear horizontal stabilisation at late times. 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 2-16.

Selected representative parameters

The recommended transmissivity of $5.5 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHi phase (outer zone), which shows a slight horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-10}$ m^2/s to $7.0 \cdot 10^{-9}$ m^2/s. The flow dimension displayed during the test is 2. 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 1,847.1 kPa.

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

5.2.9 Section 240.00–260.00 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 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 196 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased, after initial oscillations induced by the regulation unit, 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). Due to the low flow rate the derivative of the CHi phase is very noisy and the results should be regarded as an order of magnitude only. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 quite noisy throughout the test phase. Therefore the derivative analysis did not allow flow model identification. However, the CHi phase was analysed using an infinite acting homogeneous radial flow model. The derivative of the CHir phase shows a continuous downward trend at middle and late times. This is indicative for a transition from wellbore storage and skin dominated flow to pure formation flow. The CHir phase was analysed using a homogenous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-17.

Selected representative parameters

The recommended transmissivity of $3.6 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHir phase, which shows a better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-10}$ m^2/s to $5.0 \cdot 10^{-9}$ m^2/s. The flow dimension displayed during the test is 2. 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 2,006.1 kPa.

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

5.2.10 Section 260.00–280.00 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 to 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 292 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased, after initial oscillations induced by the regulation unit, from 30.9 L/min at start of the CHi phase to 9.5 L/min at the end, indicating a medium to high interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 downward slope at middle and late times and does not reach horizontal stabilisation. The CHi phase was analysed using a two shell composite radial flow model with an increasing transmissivity at some distance to the borehole. The pressure response of the CHir phase shows a continuous downward trend at middle and late times, which is indicative for the transition from wellbore storage and skin dominated flow to pure formation flow. A homogenous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-18.

Selected representative parameters

The recommended transmissivity of $1.1 \cdot 10^{-5}$ m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-06}$ m^2/s to $3.0 \cdot 10^{-05}$ m^2/s. A flow dimension of 2 was assumed for the test. 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 2,159.2 kPa.

The analyses of the CHi and CHir phases show inconsistency regarding the chosen flow model. This inconsistency is attributed to the positive skin used for the analysis of the CHir phase. No further analysis is recommended.

5.2.11 Section 280.00–300.00 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 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 198 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 10 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). The regulation unit worked well. However, the recorded flow data is noisy. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 noisy but shows a clear horizontal stabilisation at middle and late times, indicating radial flow. The CHi phase was analysed using a homogeneous radial flow model. The derivative of the CHir phase shows an upward trend at middle and late times and is still influenced by near wellbore properties, 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 2-19.

Selected representative parameters

The recommended transmissivity of $3.4 \cdot 10^{-10}$ m^2/s was derived from the analysis of the CHi phase, which shows the best horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-10}$ m^2/s to $3.0 \cdot 10^{-09}$ m^2/s. The flow dimension displayed during the test is 2. 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 2,301.1 kPa.

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

5.2.12 Section 300.00–320.00 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. 15 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 2-20.

Selected representative parameters

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

No further analysis recommended.

5.2.13 Section 320.00–340.00 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 prolonged and analysed.

Prior the pulse injection the pressure in the test section rose by 5 kPa within 15 min. During the brief injection phase of the pulse injection a total volume of about 5.9 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 $4.5\cdot10^{-11}$ m^3/Pa. It should be noted though that there is uncertainty connected with the determination of the wellbore storage coefficient, which will implicitly translate into uncertainty in the derived transmissivity.

Flow regime and calculated parameters

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 slight horizontal stabilisation at middle times with an upward slope, indicating a decrease of transmissivity at some distance to the borehole. The PI phase was analysed using a composite model with radial flow. The analysis is presented in Appendix 2-21.

Selected representative parameters

The recommended transmissivity of $4.4\cdot10^{-10}$ m^2/s was derived from the analysis of the Pi phase (inner zone). The confidence range for the interval transmissivity is estimated to be $1.0\cdot10^{-10}$ to $8.0\cdot10^{-10}$ m^2/s. The analysis was conducted using a flow dimension of 2.

5.2.14 Section 340.00–360.00 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. 14 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 2-22.

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.

5.2.15 Section 360.00–380.00 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 to 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 30 mL/min at start of the CHi phase to 20 mL/min at the end, indicating a medium to low interval transmissivity (consistent with the pulse recovery). The Chi phase is noisy, but still adequate for quantitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 but shows a trend of horizontal stabilisation at middle and late times, indicating radial flow. The CHi phase was analysed using an infinite acting homogenous radial flow model. The derivative of the CHir phase shows a downward trend at middle and late, without reaching clear horizontal stabilisation. A homogenous radial flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-23.

Selected representative parameters

The recommended transmissivity of $2.2 \cdot 10^{-8}$ m^2/s was derived from the analysis of the CHi phase, which shows a slight horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-09}$ m^2/s to $8.0 \cdot 10^{-08}$ m^2/s. A flow dimension of 2 was assumed for the test. 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 2,918.2 kPa.

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

5.2.16 Section 380.00–400.00 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 222 kPa. A hydraulic connection between test interval and bottom zone (the pressure rose by 8 kPa) was observed. The injection rate decreased from 2.5 L/min at start of the CHi phase to 1.5 L/min at the end, indicating a middle interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a relative flat derivative at middle and late times. The CHi phase was analysed using a homogenous radial flow model. The CHir phase shows a kind of horizontal stabilisation at late times, indicating 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 2-24.

Selected representative parameters

The recommended transmissivity of $2.4 \cdot 10^{-6}$ m^2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-7}$ m^2/s to $5.0 \cdot 10^{-6}$ m^2/s. The flow dimension displayed during the test is 2. 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 3,067.2 kPa.

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

5.2.17 Section 400.00–420.00 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 1.59 L/min at start of the CHi phase to 0.86 L/min at the end, indicating a middle interval transmissivity (consistent with the pulse recovery). Both phases are a bit noisy but show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a relative flat derivative and a homogenous radial flow model was used for the analysis of this test phase. The CHir phase shows a flat derivative at late times, indicating 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 2-25.

Selected representative parameters

The recommended transmissivity of $1.9 \cdot 10^{-6}$ m^2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-7}$ m^2/s to $4.0 \cdot 10^{-6}$ m^2/s. The flow dimension displayed during the test is 2. 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 3,220.8 kPa.

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

5.2.18 Section 420.00–440.00 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. 28 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 2-26.

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.

5.2.19 Section 440.00–460.00 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 low to 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 50 mL/min at start of the CHi phase to 20 mL/min at the end, indicating a low to middle interval transmissivity (consistent with the pulse recovery). During the injection phase the regulation unit switched to the vessel. The readjustment of the vessel pressure caused a short peak in the flow curve. Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a horizontal stabilisation at middle and late times. A homogenous radial flow model was used for the analysis of both phases. The analysis is presented in Appendix 2-27.

Selected representative parameters

The recommended transmissivity of $1.4 \cdot 10^{-8}$ m^2/s was derived from the analysis of the CHir phase, which shows a better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-9}$ m^2/s to $3.0 \cdot 10^{-8}$ m^2/s. The flow dimension displayed during the test is 2. 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 3,526.8 kPa.

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

5.2.20 Section 460.00–480.00 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 low to 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 196 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 10 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). During the injection phase the system switched to the injection vessel. The readjustment of the vessel pressure caused an oscillating flow and the results of the analysis should be regarded carefully. The CHir phase shows no problems and is adequate for quantitative analysis, too.

Flow regime and calculated parameters

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 CHir phase is noisy due to the above mentioned readjustments. However a homogeneous radial flow model was used to match the derivative. The derivative of the CHir phase shows a short horizontal stabilisation at middle times, followed by an upward slope indicating a decreasing transmissivity at some distance from the borehole. Therefore, 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 2-28.

Selected representative parameters

The recommended transmissivity of $6.1 \cdot 10^{-9}$ m^2/s was derived from the 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 $1.0 \cdot 10^{-9}$ m^2/s to $1.0 \cdot 10^{-8}$ m^2/s. The flow dimension displayed during the test is 2. 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 3,661.1 kPa.

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

5.2.21 Section 480.00–500.00 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. 25 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 2-29.

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.

5.2.22 Section 500.00–520.00 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, after initial oscillations induced by the control unit, from 0.19 L/min at start of the CHi phase to 0.18 L/min at the end, indicating a middle interval transmissivity (consistent with the pulse recovery). The CHir phase shows a very fast recovery, which adds uncertainties to the analysis. The CHi phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a relative flat derivative at middle and late times, indicating radial flow. The CHi phase was matched using a homogeneous radial flow model. Due to the very fast recovery of the CHir phase the early time data of the derivative is not conclusive. A homogeneous radial flow model with wellbore storage and skin was used for the analysis. The analysis is presented in Appendix 2-30.

Selected representative parameters

The recommended transmissivity of $4.8 \cdot 10^{-7}$ m^2/s was derived from the analysis of the CHi phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-7}$ m^2/s to $8.0 \cdot 10^{-7}$ m^2/s. The flow dimension displayed during the test is 2. 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 3,957.5 kPa.

No further analysis is recommended.

5.2.23 Section 520.00–540.00 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. 14 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 2-31.

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.

5.2.24 Section 540.00–560.00 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. 14 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 2-32.

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.

5.2.25 Section 560.00–580.00 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. 11 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 2-33.

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.

5.2.26 Section 580.00–600.00 m, test no. 1 and 2, injection

Comments to test

Due to wrong test depth calculation the test was repeated.

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. 21 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 2-34.

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.

5.2.27 Section 600.00–620.00 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. 48 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 2-35.

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.

5.2.28 Section 620.00–640.00 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 229 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 3.8 L/min at start of the CHi phase to 1.2 L/min at the end, indicating a middle interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a downward slope at middle times and a trend of horizontal stabilisation at late times. The CHi phase was matched using a radial composite flow model. The derivative of the CHir phase shows a downward slope at middle time, indicating an increase of transmissivity at some distance from the borehole. A two shell composite model with increasing transmissivity was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-36.

Selected representative parameters

The recommended transmissivity of $2.3 \cdot 10^{-7}$ m^2/s was derived from the 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 $8.0 \cdot 10^{-8}$ m^2/s to $3.0 \cdot 10^{-6}$ m^2/s. The flow dimension displayed during the test is 2. 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 4,845.7 kPa.

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

5.2.29 Section 640.00–660.00 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, the pulse recovered very slowly and stabilized after a short time. This phenomenon is caused by a combination of prolonged packer expansion and a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$). The pulse injection phase is also still influenced by the packer expansion. None of the test phases is analysable.

No analysis was performed. The measured data is presented in Appendix 2-37.

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.

5.2.30 Section 660.00–680.00 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 prolonged and analysed.

Prior the pulse injection the pressure in the test section rose by 6 kPa within 15 min. 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 257 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $5.1 \cdot 10^{-11}$ m^3/Pa. It should be noted though that there is uncertainty connected with the determination of the wellbore storage coefficient, which will implicitly translate into uncertainty in the derived transmissivity.

Flow regime and calculated parameters

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 continuously upward trend with a change in the inclination at late times, but no horizontal stabilisation was reached. A two shell composite radial flow model was chosen for the analysis of the Pi phase. Due to no horizontal stabilisation, the outer zone transmissivity should be regarded as the upper limit. The analysis is presented in Appendix 2-38.

Selected representative parameters

The recommended transmissivity of $3.9 \cdot 10^{-10}$ m^2/s was derived from the analysis of the Pi phase (inner zone). The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-12}$ to $8.0 \cdot 10^{-10}$ m^2/s. This range encompasses the outer zone transmissivity and is based on the results of the appropriate 5 m tests. The analysis was conducted using a flow dimension of 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

5.2.31 Section 680.00–700.00 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. 24 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 2-39.

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.

5.2.32 Section 700.00–720.00 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 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 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased, after initial oscillations induced by the control unit, from 84 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). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows an upward slope at middle times without horizontal stabilisation at late times. The CHi phase was matched using a radial composite flow model. The derivative of the CHir phase shows a horizontal stabilisation at middle times followed by an upward slope at late times. A two shell composite model with decreasing transmissivity was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-40.

Selected representative parameters

The recommended transmissivity of $8.1 \cdot 10^{-9}$ m^2/s was derived from the 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 $1.0 \cdot 10^{-9}$ m^2/s to $3.0 \cdot 10^{-8}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the low transmissivity.

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

5.2.33 Section 720.00–740.00 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 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 injection rate decreased, after initial oscillations induced by the control unit, from 31 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). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a slight upward trend at middle and late times. The CHi phase was matched using a radial composite flow model. The derivative of the CHir phase shows a horizontal stabilisation at middle times followed by an upward slope at late times. A two shell composite model with decreasing transmissivity at some distance fromr the borehole was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-41.

Selected representative parameters

The recommended transmissivity of $4.2 \cdot 10^{-9}$ m^2/s was derived from the 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 $1.0 \cdot 10^{-9}$ m^2/s to $1.0 \cdot 10^{-8}$ m^2/s. The flow dimension displayed during the test is 2. 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 5,590.2 kPa.

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

5.2.34 Section 740.00–760.00 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 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 CHir phases and the Pi phase to compare the results were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 194 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 10 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 strong regulation effects – switching between the middle and small valve – the injection phase is not analysable. The CHir phase shows no problems and is adequate for quantitative analysis. In addition the Pi phase was analysed.

Flow regime and calculated parameters

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 CHir phase shows a flat derivative at late times, indicating formation flow stabilisation and radial flow. The CHir phase was matched using a homogeneous radial flow model with wellbore storage and skin. The Pi phase was analysed using homogeneous radial flow model and the results are consistent with the CHir phase. The analysis is presented in Appendix 2-42.

Selected representative parameters

The recommended transmissivity of $6.1 \cdot 10^{-10}$ m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $2.0 \cdot 10^{-10}$ m^2/s to $1.0 \cdot 10^{-9}$ m^2/s. The flow dimension displayed during the test is 2. 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 5,731.5 kPa.

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

5.2.35 Section 760.00–780.00 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 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 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 26 mL/min at start of the CHi phase to 11 mL/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.

Flow regime and calculated parameters

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 stabilisation at middle and late times. A homogeneous radial flow model was used for the analysis of both phases. The analysis is presented in Appendix 2-43.

Selected representative parameters

The recommended transmissivity of $3.0 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-10}$ m^2/s to $6.0 \cdot 10^{-9}$ m^2/s. The flow dimension displayed during the test is 2. 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 5,881.5 kPa.

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

5.2.36 Section 780.00–800.00 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 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 202 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased, after initial oscillations induced by the regulation unit, from 16 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 flowrate, the CHi phase is a bit noisy but still amenable for quantitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis too.

Flow regime and calculated parameters

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 noisy but tends to horizontal stabilisation at late times. The CHi phase was analysed using a homogeneous radial flow model. The derivative of the CHir phase shows a horizontal stabilisation at middle times followed by an upward slope at late times. A two shell composite model with decreasing transmissivity at some distance from the borehole was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-44.

Selected representative parameters

The recommended transmissivity of $2.3 \cdot 10^{-9}$ m^2/s was derived from the 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 $7.0 \cdot 10^{-10}$ m^2/s to $5.0 \cdot 10^{-9}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the low transmissivity.

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

5.2.37 Section 800.00–820.00 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 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, after initial oscillations induced by the regulation unit, from 11 mL/min at start of the CHi phase to 6 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Because of the low injection rate, the CHi phase is a bit noisy but still adequate for quantitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis too.

Flow regime and calculated parameters

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 noisy but tends to horizontal stabilisation at late times. The CHi phase was analysed using a homogeneous radial flow model. The derivative of the CHir phase shows a horizontal stabilisation at middle times followed by an upward slope at late times. A two shell composite model with decreasing transmissivity at some distance from the borehole was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-45.

Selected representative parameters

The recommended transmissivity of $3.8·10^{-9}$ m^2/s was derived from the 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 $1.0·10^{-09}$ m^2/s to $8.0·10^{-9}$ m^2/s. The flow dimension displayed during the test is 2. 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 6,163.3 kPa.

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

5.2.38 Section 820.00–840.00 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. 20 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0·10^{-11}$ 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 $1.0·10^{-11}$ m^2/s.

No further analysis recommended.

5.2.39 Section 840.00–860.00 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 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 198 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 50 mL/min at start of the CHi phase to 32 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). The recorded data of the CHi phase is a little bit noisy, but still amenable for quantitative analysis. The CHir phase shows a relatively fast recovery, but shows no further problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a noisy but flat derivative at middle and late times. The derivative of the CHir phase shows a horizontal stabilisation at middle and late times, indicating radial flow. Both phases were analysed using a radial infinite acting homogeneous flow model. The analysis is presented in Appendix 2-47.

Selected representative parameters

The recommended transmissivity of $6.1 \cdot 10^{-8}$ m^2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $2.0 \cdot 10^{-8}$ m^2/s to $1.0 \cdot 10^{-7}$ m^2/s. The flow dimension displayed during the test is 2. 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 6,453.7 kPa.

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

5.2.40 Section 860.00–880.00 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 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 187 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 3 mL/min at start of the CHi phase to 1.7 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 CHi phase is noisy, but still amenable for quantitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 is noisy but shows a flat derivative at middle and late times. No clear flow stabilisation was reached during the CHir phase and the data is still influenced by near wellbore effects like wellbore storage and skin. Both phases were analysed using a radial infinite acting homogeneous flow model. The analysis is presented in Appendix 2-48.

Selected representative parameters

The recommended transmissivity of $1.4 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHi phase, which shows the better horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-10}$ m^2/s to $6.0 \cdot 10^{-9}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6,616.6 kPa.

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

5.2.41 Section 880.00–900.00 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. 32 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 2-49.

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.

5.2.42 Section 900.00–920.00 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. 138 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 2-50.

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.

5.2.43 Section 920.00–940.00 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. 98 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.

5.2.44 Section 940.00–960.00 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. 113 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.

5.2.45 Section 955.00–975.00 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. 58 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 2-53.

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.

5.3 5 m single-hole injection tests

In the following, the 5 m section tests conducted in borehole KLX15A are presented and analysed.

5.3.1 Section 380.00–385.00 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 low to moderate 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 223 kPa. No hydraulic connection to adjacent zones was observed. The injection rate decreased from 12 mL/min at start of the CHi phase to 6 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). The CHir phase shows a relatively fast recovery, which adds uncertainty to the analysis. However, both phases are adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a upward trend at middle times, indicating a change of the transmissivity at some distance to the borehole.The CHi phase was analysed using a radial composite flow model. The derivative of the CHir phase shows a downward trend at middle times, indicating a large positive skin. There is a slight indication of horizontal stabilisation in the late time derivative. A radial homogeneous flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-54.

Selected representative parameters

The recommended transmissivity of $7.1 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHi phase (inner zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-9}$ m^2/s to $4.0 \cdot 10^{-8}$ m^2/s. The flow dimension displayed during the test is 2. 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 2,954.4 kPa.

The analyses of the CHi and CHir phases show small inconsistency regarding the chosen flow model. This inconsistency can be attributed to the fast recovery and high skin values of the CHir phase. No further analysis is recommended.

5.3.2 Section 385.00–390.00 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. A hydraulic connection between test interval and bottom zone (the pressure rose by 6 kPa) was observed. The injection rate decreased from 2.1 L/min at start of the CHi phase to 1.2 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.

Flow regime and calculated parameters

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 phase shows a clear horizontal stabilisation at middle and late times, indicating radial flow. The derivative of the CHir phase shows no clear horizontal stabilisation at late times, the derivative seems to flatten. That was interpreted as the transition to radial flow. A homogenous radial flow model was used for the analysis of both phases. The analysis is presented in Appendix 2-55.

Selected representative parameters

The recommended transmissivity of $2.6 \cdot 10^{-6}$ m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-6}$ m^2/s to $4.0 \cdot 10^{-6}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 2,989.7 kPa.

The analyses of the CHi and CHir phases show good consistency concerning the derived transmissivities. No further analysis is recommended.

5.3.3 Section 390.00–395.00 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 216 kPa. A hydraulic connection between test interval and bottom zone was observed. The pressure below increased during the injection phase up to a total of 5 kPa. The injection rate decreased from 1.5 L/min at start of the CHi phase to 0.8 L/min at the end, indicating a middle interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a relative noisy, but flat derivative at middle and late times, indicating radial flow. The CHi phase was analysed using an infinite acting homogeneous radial flow model. The derivative of the CHir phase shows a downward trend at middle and late times. The CHir phase did not reach radial flow conditions. This is indicative for a transition from wellbore storage and skin dominated flow to pure formation flow. A homogenous radial flow model with wellbore storage and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-56.

Selected representative parameters

The recommended transmissivity of $9.1 \cdot 10^{-7}$ m^2/s was derived from the analysis of the CHi phase, which shows the best derivative quality and horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-7}$ m^2/s to $2.0 \cdot 10^{-6}$ m^2/s. The flow dimension displayed during the test is 2. 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 3,027.3 kPa.

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

5.3.4 Section 395.00–400.00 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 prolonged and analysed.

Prior the pulse injection the pressure in the test section rose by 23 kPa within 15 min after closing the test valve. During the brief injection phase of the pulse injection a total volume of about 3.2 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 196 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.7 \cdot 10^{-11}$ m^3/Pa. It should be noted though that there is uncertainty connected with the determination of the wellbore storage coefficient, which will implicitly translate into uncertainty in the derived transmissivity.

Flow regime and calculated parameters

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure derivative shows horizontal stabilisation at late times, indicating radial flow. The PI phase was analysed using a composite model with radial flow, wellbore storage and skin. The analysis is presented in Appendix 2-57.

Selected representative parameters

The recommended transmissivity of $3.5 \cdot 10^{-11}$ m²/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-11}$ to $8.0 \cdot 10^{-11}$ m²/s. The analysis was conducted using a flow dimension of 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

5.3.5 Section 400.00–405.00 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 210 kPa. No hydraulic connection to the adjacent sections was observed. The injection rate decreased from 1.0 L/min at start of the CHi phase to 0.55 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.

Flow regime and calculated parameters

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 and CHir phase show a relative flat derivative at middle and late times, indicating radial flow. Both phases were analysed using a homogeneous radial flow model. The analysis is presented in Appendix 2-58.

Selected representative parameters

The recommended transmissivity of $1.5 \cdot 10^{-6}$ m²/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-7}$ m²/s to $3.0 \cdot 10^{-6}$ m²/s. The flow dimension displayed during the test is 2. 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 3,103.1 kPa.

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

5.3.6 Section 405.00–410.00 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. 39 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$ m²/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.

5.3.7 Section 410.00–415.00 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 sections was observed. The injection rate decreased from 0.6 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 CHir phase shows a relatively fast recovery, which adds uncertainty to the derivative analysis. However, both phases are adequate for quantitative analysis.

Flow regime and calculated parameters

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 noisy horizontal stabilisation at middle and late times, indicating radial flow. The CHi phase was analysed using a homogeneous radial flow model. Due to the fast recovery the early data of the CHir phase are of poor quality. The CHir phase shows a noisy but clear horizontal stabilisation at middle and 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 2-60.

Selected representative parameters

The recommended transmissivity of $9.4 \cdot 10^{-7}$ m^2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-7}$ m^2/s to $3.0 \cdot 10^{-6}$ m^2/s. The flow dimension displayed during the test is 2. 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 3,178.6 kPa.

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

5.3.8 Section 415.00–420.00 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. 32 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.

5.3.9 Section 440.00–445.00 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 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 222 kPa. No hydraulic connection to the adjacent sections was observed. The injection rate decreased from 7.0 mL/min at start of the CHi phase to 3.5 L/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the low flow rate the Chi phase is noisy. However, both phases are adequate for quantitative analysis.

Flow regime and calculated parameters

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 and CHir phase show relatively flat and horizontal derivatives at middle and late times. Both phases were analysed using a homogeneous radial flow model. The analysis is presented in Appendix 2-62.

Selected representative parameters

The recommended transmissivity of $7.8 \cdot 10^{-10}$ m^2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-10}$ m^2/s to $3.0 \cdot 10^{-9}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,405.1 kPa.

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

5.3.10 Section 445.00–450.00 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. 500 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.

5.3.11 Section 450.00–455.00 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 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 200 kPa. No hydraulic connection to the adjacent sections was observed. The regulation unit needed some time to get stable pressure conditions. Therefore, the early time data of the Chi phase are of poor quality. The injection rate decreased from 26.0 mL/min at start of the CHi phase to 17.0 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). The CHir phase and the late time data of the Chi phase are adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a relative flat and horizontal derivative at late times, indicating radial flow. For the analysis of the CHi phase a infinite acting homogeneous radial flow model was used. The derivative of the CHir phase shows a horizontal stabilisation at middle times, followed by an upward trend 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 2-64.

Selected representative parameters

The recommended transmissivity of $1.2 \cdot 10^{-8}$ m^2/s was derived from the analysis of the CHi phase, which shows the best horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-9}$ m^2/s to $4.0 \cdot 10^{-8}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,481.8 kPa.

The analyses of the CHi and CHir phases show some inconsistency regarding the chosen flow model. This can be caused by the poor data quality of the early time Chi data. However, regarding the derived transmissivities both phases show consistency. No further analysis is recommended.

5.3.12 Section 455.00–460.00 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 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 200 kPa. No hydraulic connection to the adjacent sections was observed. The injection rate decreased from 25.0 mL/min at start of the CHi phase to 8.0 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 a bit noisy, but still amenable for quantitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a relatively flat and horizontal derivative at early times, followed by a downward slope at middle and late times, indicating an increasing transmissivity at some distance from the borehole. For the analysis of the CHi phase a radial composite flow model was used. The derivative of the CHir phase shows a downward slope at middle and late times without reaching horizontal stabilisation. A two shell composite radial flow model was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-65.

Selected representative parameters

The recommended transmissivity of $2.9 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHi phase (inner zone), which shows the best horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-10}$ m^2/s to $6.0 \cdot 10^{-9}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the low transmissivity.

The analyses of the CHi and CHir phases show consistency regarding the derived transmissivities. No further analysis is recommended.

5.3.13 Section 460.00–465.00 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 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 202 kPa. No hydraulic connection to the adjacent sections was observed. The injection rate decreased from 7.0 mL/min at start of the CHi phase to 3.0 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 still amenable for quantitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a noisy but relatively flat and horizontal derivative at middle and late times. For the analysis of the CHi phase an infinite acting homogeneous radial flow model was used. The derivative of the CHir phase shows a downward slope at middle and early late times. The very late time data can be interpreted as the beginning of a horizontal stabilisation, which is characteristic for 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 2-66.

Selected representative parameters

The recommended transmissivity of $5.4 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $2.0 \cdot 10^{-9}$ m^2/s to $8.0 \cdot 10^{-9}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,554.5 kPa.

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

5.3.14 Section 465.00–470.00 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 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 227 kPa. No hydraulic connection to the adjacent sections was observed. The injection rate decreased from 6.0 mL/min at start of the CHi phase to 3.0 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 still amenable for quantitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a noisy but relatively horizontal derivative at middle and late times. For the analysis of the CHi phase an infinite acting homogeneous radial flow model was used. The late time derivative of the CHir phase shows an indication of horizontal stabilisation, 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 2-67.

Selected representative parameters

The recommended transmissivity of $2.9 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-9}$ m^2/s to $5.0 \cdot 10^{-9}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,589.7 kPa.

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

5.3.15 Section 470.00–475.00 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 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 212 kPa. No hydraulic connection to the adjacent sections was observed. The injection rate decreased from 5.0 mL/min at start of the CHi phase to 2.0 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 still amenable for quantitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 noisy and allows no flow model identification. The CHi phase was analysed using an infinite acting homogeneous radial flow model. The derivative of the CHir phase shows a flattening downward trend which tends to horizontal stabilisation at late times. This indicates 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 2-68.

Selected representative parameters

The recommended transmissivity of $1.2 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-10}$ m^2/s to $3.0 \cdot 10^{-9}$ m^2/s. The flow dimension during the test was assumed to be 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,629.9 kPa.

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

5.3.16 Section 475.00–480.00 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. 57 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 2-69.

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.

5.3.17 Section 500.00–505.00 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 202 kPa. No hydraulic connection to the adjacent sections was observed. The injection rate decreased from 0.35 L/min at start of the CHi phase to 0.19 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase recovered very fast, which adds uncertainty to the derivative analysis. The results should be regarded carefully. The CHi phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 flat horizontal stabilisation at middle and late times, indicating radial flow. The CHi phase was analysed using an infinite acting homogeneous radial flow model. The derivative of the CHir phase was analysed using a homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-70.

Selected representative parameters

The recommended transmissivity of $2.3 \cdot 10^{-7}$ m^2/s was derived from the analysis of the CHi phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-8}$ m^2/s to $6.0 \cdot 10^{-7}$ m^2/s. The flow dimension displayed during the test is 2. 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 3,847.9 kPa.

The analyses of the CHi and CHir phases show some minor inconsistencies, which can be attributed to the poor quality of the CHir data. No further analysis is recommended.

5.3.18 Section 505.00–510.00 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 2-71.

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.

5.3.19 Section 510.00–515.00 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. 50 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 2-72.

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.

5.3.20 Section 515.00–520.00 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. 49 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 2-73.

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.

5.3.21 Section 620.00–625.00 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. 174 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 2-74.

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.

5.3.22 Section 623.00–628.00 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 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 224 kPa. No hydraulic connection to the adjacent sections was observed. The injection rate decreased from 6.0 mL/min at start of the CHi phase to 3.0 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 a bit noisy, but still amenable for quantitative analysis. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 noisy but shows horizontal stabilisation at middle and late times, indicating radial flow. The CHi phase was analysed using an infinite acting homogeneous radial flow model. The derivative of the CHir phase shows a flattening downward trend without reaching clear horizontal stabilisation. This indicates 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 2-75.

Selected representative parameters

The recommended transmissivity of $1.9 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHi phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-9}$ m^2/s to $1.0 \cdot 10^{-8}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4,759.4 kPa.

The analyses of the CHi and CHir phases show some inconsistencies. This can be attributed to the noisy flow rate and the fact, that the CHir phase did not reach radial flow. No further analysis is recommended.

5.3.23 Section 628.00–633.00 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.

At the 1^{st} trial, the system could not reach stable pressure conditions. Therefore it was decided to stop the injection and repeat it.

The CHi phase was conducted using a pressure difference of 224 kPa. No hydraulic connection to the adjacent sections was observed. The injection rate decreased from 2.9 L/min at start of the CHi phase to 1.1 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.

Flow regime and calculated parameters

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 part at middle times, followed by a downward trend at late times. The CHi phase was analysed using a two shell composite radial flow model with an increasing transmissivity at some distance to the borehole. Similar to the CHi phase, the CHir phase shows a downward slope at middle and late times without reaching clear horizontal stabilisation. 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 2-76.

Selected representative parameters

The recommended transmissivity of $3.4 \cdot 10^{-7}$ m^2/s was derived from the 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 $1.0 \cdot 10^{-7}$ m^2/s to $2.0 \cdot 10^{-6}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4,793.4 kPa.

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

5.3.24 Section 630.00–635.00 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 202 kPa. No hydraulic connection to the adjacent sections was observed. The regulation unit needed some time to get stable pressure conditions. Therefore the early time data of the Chi phase are of poor data quality. The injection rate decreased from 3.5 L/min at start of the CHi phase to 1.2 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.

Flow regime and calculated parameters

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 downward slope at middle and late times, without reaching horizontal stabilisation. The CHi phase was analysed using a two shell composite radial flow model with an increasing transmissivity at some distance to the borehole. Similar to the CHi phase, the CHir phase shows a downward slope at middle and late times without reaching clear horizontal stabilisation. 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 2-77.

Selected representative parameters

The recommended transmissivity of $3.3 \cdot 10^{-7}$ m²/s was derived from the 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 $2.0 \cdot 10^{-7}$ m²/s to $3.0 \cdot 10^{-6}$ m²/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4,806.1 kPa.

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

5.3.25 Section 635.00–640.00 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 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 sections was observed. The injection rate decreased from 2 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 very low flow rate the recorded data of the flow rate is very noisy and the results of the CHi phase analysis should be regarded as order of magnitude only. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted from the slope of the semi-log derivative plotted in log-log coordinates. Due to the poor data quality the CHi phase allows no determination of an flow model. However, in case of the present test an infinite acting homogeneous 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.

Selected representative parameters

The recommended transmissivity of $1.7 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $4.0 \cdot 10^{-10}$ m^2/s to $3.0 \cdot 10^{-9}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4,852.9 kPa.

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

5.3.26 Section 660.00–665.00 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 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 2-79.

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.

5.3.27 Section 665.00–670.00 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. 25 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 2-80.

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.

5.3.28 Section 670.00–675.00 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. 281 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 2-81.

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.

5.3.29 Section 675.00–680.00 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. 37 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 2-82.

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.

5.3.30 Section 700.00–705.00 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. 95 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 2-83.

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.

5.3.31 Section 705.00–710.00 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 low to 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 sections was observed. The injection rate decreased from 49 mL/min at start of the CHi phase to 15 mL/min at the end, indicating a low to medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 continuous upward slope at middle times and does not reach horizontal stabilisation. The CHi phase was analysed using a two shell composite radial flow model with a decreasing transmissivity at some distance to the borehole. The Chir phase shows a horizontal stabilisation at early times, followed by an upward trend without reaching horizontal stabilisation. 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 2-84.

Selected representative parameters

The recommended transmissivity of $1.4 \cdot 10^{-8}$ m^2/s was derived from the 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 $4.0 \cdot 10^{-9}$ m^2/s to $3.0 \cdot 10^{-8}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the low transmissivity.

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

5.3.32 Section 710.00–715.00 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. 231 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 2-85.

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.

5.3.33 Section 715.00–720.00 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. 15 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 2-86.

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.

5.3.34 Section 720.00–725.00 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. 50 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 2-87.

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.

5.3.35 Section 725.00–730.00 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. 85 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 2-88.

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.

5.3.36 Section 730.00–735.00 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. 33 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 2-89.

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.

5.3.37 Section 735.00–740.00 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 low to 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 sections was observed. The injection rate decreased from 25 mL/min at start of the CHi phase to 10 mL/min at the end, indicating a low to medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 an upward trend at middle times followed by horizontal stabilisation at late times. This behaviour is indicative for a decrease of transmissivity at some distance from the borehole and radial flow. A two shell composite flow model was chosen for the analysis of the CHi phase. The derivative of the CHir phase shows slight horizontal stabilisation at early times and an upward slope at middle and late times. The CHir phase was analysed using a composite radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-90.

Selected representative parameters

The recommended transmissivity of $3.6 \cdot 10^{-9}$ m^2/s was derived from the 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 $1.0 \cdot 10^{-9}$ m^2/s to $1.0 \cdot 10^{-8}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 5,585.8 kPa.

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

5.3.38 Section 740.00–745.00 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 prolonged and analysed.

Prior the pulse injection the pressure in the test section rose by 48 kPa within 15 min. This can be explained by prolonged packer expansion in a relative tight section and adds uncertainty to the determination of the initial pulse pressure. During the brief injection phase of the pulse injection a total volume of about 1.9 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 209 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $9.1 \cdot 10^{-12}$ m^3/Pa. It should be noted though that there is uncertainty connected with the determination of the wellbore storage coefficient, which will implicitly translate into uncertainty in the derived transmissivity.

Flow regime and calculated parameters

For the interpretation a flow dimension of 2 (radial flow) was assumed. In case of the present test the deconvolved PI pressure derivative shows after a slight horizontal stabilisation an upward trend at middle times. The derivative tends to horizontal stabilisation on a higher level at late times, indicating a decrease of transmissivity. The PI phase was analysed using a composite model with radial flow, wellbore storage and skin. The analysis is presented in Appendix 2-91.

Selected representative parameters

The recommended transmissivity of $1.8 \cdot 10^{-10}$ m^2/s was derived from the analysis of the Pi phase (inner 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 analysis was conducted using a flow dimension of 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

5.3.39 Section 745.00–750.00 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. 51 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 2-92.

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.

5.3.40 Section 750.00–755.00 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 2-93.

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.

5.3.41 Section 755.00–760.00 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. 83 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 2-94.

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.

5.3.42 Section 760.00–765.00 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. 67 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 2-95.

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.

5.3.43 Section 765.00–770.00 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 prolonged and analysed.

Prior the pulse injection the pressure in the test section rose by 24 kPa within 15 min. 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 the test depth. During the brief injection phase of the pulse injection a total volume of about 4.1 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 202 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $2.1 \cdot 10^{-11}$ m³/Pa. It should be noted though that there is uncertainty connected with the determination of the wellbore storage coefficient, which will implicitly translate into uncertainty in the derived transmissivity.

Flow regime and calculated parameters

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 with a change in the inclination at middle times. The derivative tends to horizontal stabilisation at late times, indicating a decrease of transmissivity. The PI phase was analysed using a composite model with radial flow, wellbore storage and skin. The analysis is presented in Appendix 2-96.

Selected representative parameters

The recommended transmissivity of $2.5 \cdot 10^{-10}$ m²/s was derived from the analysis of the Pi phase (inner zone). The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-11}$ to $5.0 \cdot 10^{-10}$ m²/s. The analysis was conducted using a flow dimension of 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

5.3.44 Section 770.00–775.00 m, test no. 1, injection

Comments to test

Due to technical problems with the regulation unit the first injection phase was skipped and repeated. The second test cycle showed no problems, the regulation unit 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 low to 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 190 kPa. No hydraulic connection to the adjacent sections was observed. The injection rate decreased from 15 mL/min at start of the CHi phase to 7 mL/min at the end, indicating a low to medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 flat and relative horizontal derivative at middle and late times, indicating radial flow. Both phases were analysed using a homogeneous radial flow model. The analysis is presented in Appendix 2-97.

Selected representative parameters

The recommended transmissivity of $2.6·10^{-9}$ m^2/s was derived from the analysis of the CHi phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $7.0·10^{-10}$ m^2/s to $6.0·10^{-9}$ m^2/s. The flow dimension displayed during the test is 2. 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 5,843.5 kPa.

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

5.3.45 Section 775.00–780.00 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 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 180 kPa. No hydraulic connection to the adjacent sections was observed. The injection rate decreased from 6 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). Because of the low flow rate the measured flow data is noisy and the results of the CHi analysis should be regarded carefully. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a noisy horizontal derivative at middle and late times. The CHi phase was analysed using a homogeneous radial flow model. The CHir phase shows a short horizontal stabilisation at middle times, followed by an upward slope at late times, indicating a change of transmissivity at some distance from the borehole. A two shell composite radial flow model with wellbore storage and skin was used for the analysis. The analysis is presented in Appendix 2-98.

Selected representative parameters

The recommended transmissivity of $6.8·10^{-9}$ m^2/s was derived from the analysis of the CHir phase (inner zone), which shows the best horizontal stabilisation and derivative quality. The confidence range for the interval transmissivity is estimated to be $2.0·10^{-9}$ m^2/s to $9.0·10^{-9}$ m^2/s. The flow dimension displayed during the test is 2. 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 5,909.7 kPa.

The analyses of the CHi and CHir phases show inconsistency regarding the chosen flow model. This inconsistency can be attributed to the low flow rate which causes a noisy CHi phase derivative. No further analysis is recommended.

5.3.46 Section 780.00–785.00 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, the pulse recovered very slowly and stabilized after a short time. This phenomenon is caused by a combination of prolonged packer expansion and a very tight section (T probably smaller than $1.0 \cdot 10^{-11}$). The pulse injection phase is also still influenced by the packer expansion. None of the test phases is analysable.

No analysis was performed. The measured data is presented in Appendix 2-99.

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.

5.3.47 Section 785.00–790.00 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. 121 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 2-100.

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.

5.3.48 Section 790.00–795.00 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 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 190 kPa. No hydraulic connection to the adjacent sections was observed. The injection rate decreased from 12 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). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 stabilisation at early times, followed by an upward trend at middle and late times. A composite radial flow model with a decreasing transmissivity at some distance from the borehole was used for the analysis of both phases. The analysis is presented in Appendix 2-101.

Selected representative parameters

The recommended transmissivity of $2.2 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHir phase (inner zone), which shows the best derivative quality. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-10}$ m^2/s to $5.0 \cdot 10^{-9}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6,009.0 kPa.

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

5.3.49 Section 795.00–800.00 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. 53 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 2-102.

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.

5.3.50 Section 800.00–805.00 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 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 2-103.

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.

5.3.51 Section 805.00–810.00 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 2-104.

Selected representative parameters

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

No further analysis recommended.

5.3.52 Section 810.00–815.00 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 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 200 kPa. No hydraulic connection to the adjacent sections was observed. The injection rate decreased from 16 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). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 stabilisation at early times, followed by an upward slope with horizontal stabilisation at late times. A composite radial flow model with a decreasing transmissivity at some distance from the borehole was used for the analysis of both phases. The analysis is presented in Appendix 2-101.

Selected representative parameters

The recommended transmissivity of $4.9·10^{-9}$ m^2/s was derived from the analysis of the CHir phase (inner zone), which shows the best horizontal stabilisation and derivative quality. The confidence range for the interval transmissivity is estimated to be $1.0·10^{-9}$ m^2/s to $8.0·10^{-9}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6,137.8 kPa.

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

5.3.53 Section 815.00–820.00 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. 81 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than $1.0·10^{-11}$ m^2/s). None of the test phases is analysable.

The measured data is presented in Appendix 2-106.

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.

5.3.54 Section 840.00–845.00 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 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 164 kPa. No hydraulic connection to the adjacent sections was observed. The injection rate decreased from 2 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 measured flow data is noisy and the results of the CHi analysis should be regarded carefully. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a noisy derivative and does not allow flow model identification. The CHi phase was analysed using a homogeneous radial flow model. 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 used for the analysis of the CHir phase. The analysis is presented in Appendix 2-107.

Selected representative parameters

The recommended transmissivity of $1.7 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $4.0 \cdot 10^{-10}$ m^2/s to $5.0 \cdot 10^{-9}$ m^2/s. For the analysis of both tests a flow dimension of 2 was assumed. 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 6,411.2 kPa.

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

5.3.55 Section 845.00–850.00 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 low to 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 239 kPa. No hydraulic connection to the adjacent sections was observed. The injection rate decreased from 15 mL/min at start of the CHi phase to 10 mL/min at the end, indicating a low to medium interval transmissivity (consistent with the pulse recovery). The regulation unit functioned well, but the recorded flow data is noisy. The CHir phase shows a relative fast recovery, but is still adequate for quantitative analysis.

Flow regime and calculated parameters

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 does not allow flow model identification. However, the CHi phase was analysed using a homogeneous radial flow model. The CHir phase shows a steep downward trend at middle times, which is typical for a high positive skin. 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 2-108.

Selected representative parameters

The recommended transmissivity of $2.4 \cdot 10^{-8}$ m^2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $6.0 \cdot 10^{-9}$ m^2/s to $7.0 \cdot 10^{-8}$ m^2/s. The flow dimension displayed during the test is 2. 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 6,391.7 kPa.

No further analysis is recommended.

5.3.56 Section 850.00–855.00 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. 69 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 2-109.

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.

5.3.57 Section 855.00–860.00 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 low to 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 sections was observed. The injection rate decreased, after initial oscillations induced by the regulation unit, from 19 mL/min at start of the CHi phase to 10 mL/min at the end, indicating a low to medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

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 stabilisation at middle and late times. The CHi phase was analysed using a homogeneous radial flow model. The CHir phase derivative shows a horizontal stabilisation at middle times, followed by an upward slope and a new stabilisation at a higher level, indicating a decreasing transmissivity at some distance from the borehole. The derivative at late times tends to horizontal stabilisation. A radial composite flow model with wellbore storage and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-110.

Selected representative parameters

The recommended transmissivity of $1.4 \cdot 10^{-8}$ m^2/s was derived from the 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 $4.0 \cdot 10^{-9}$ m^2/s to $3.0 \cdot 10^{-8}$ m^2/s. The flow dimension displayed during the test is 2. 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 6,447.4 kPa.

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

5.3.58 Section 860.00–865.00 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. 168 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 2-111.

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.

5.3.59 Section 865.00–870.00 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 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 181 kPa. No hydraulic connection to the adjacent sections was observed. The injection rate decreased from 2 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 measured flow data is noisy and the results of the CHi analysis should be regarded carefully. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows a noisy derivative and does not allow flow model identification. The CHi phase was analysed using a homogeneous radial flow model. 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 used for the analysis of the CHir phase. The analysis is presented in Appendix 2-112.

Selected representative parameters

The recommended transmissivity of $4.4 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-10}$ m^2/s to $7.0 \cdot 10^{-9}$ m^2/s. The flow dimension for the analysis was assumed to be 2. 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 6,546.8 kPa.

No further analysis is recommended.

5.3.60 Section 870.00–875.00 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. 150 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 2-113.

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.

5.3.61 Section 875.00–880.00 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. 43 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 2-114.

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.

5.4 Single packer injection test

In the following, the single packer test conducted in borehole KLX15A is presented and analysed.

5.4.1 Section 970.00–1,000.43 m, single packer, test no. 1, injection

Comments to test

For the single packer test the tool was build like a double packer system with 5 m interval length. The inflation line for the bottom packer has been plugged that only the top packer was inflated. 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 low to 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 first injection showed a sudden increase in the flow rate after approx. 5 min. This clear change in flow rate can be attributed to clean up effects in the borehole vicinity. The recorded pressure data of the subsequent conducted recovery is noisy, as well. None of the test phases are analysable. Therefore the injection and recovery phase was repeated.

The second CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent sections was observed. The injection rate decreased from 60 mL/min at start of the CHi phase to 40 mL/min at the end, indicating a low to medium interval transmissivity (consistent with the pulse recovery). A similar effect of increase in flow rate was observed, but the disturbance is relatively small. Due to the low flow rate and the described flow rate effects the measured flow data is noisy and the results of the CHi analysis should be regarded carefully. The CHir phase shows no problems and is adequate for quantitative analysis.

Flow regime and calculated parameters

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 shows an upward slope at middle and late times, without reaching horizontal stabilisation. The CHi phase was analysed using a radial composite flow model with a decreasing transmissivity at some distance from the borehole. Similar to the CHi phase, the derivative of the CHir phase shows an upward trend at middle and late times. A radial composite flow model with wellbore storage and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-115.

Selected representative parameters

The recommended transmissivity of $8.3 \cdot 10^{-8}$ m^2/s was derived from the 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 $4.0 \cdot 10^{-8}$ m^2/s to $3.0 \cdot 10^{-7}$ m^2/s. The flow dimension displayed during the test is 2. 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 7,289.6 kPa.

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

6 Summary of results

This 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.

6.1 General test data and results

Table 6-1. General test data from hydraulic tests in KL15A (for nomenclature see Appendix 4 and below).

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
80.00	180.00	070412 07:48	070412 10:08	4.42E–04	5.20E–04	1800	1800	1405	1405	1441	1411	8.8	**CHi / CHir**
180.00	280.00	070412 13:56	070412 16:07	1.28E–04	1.42E–04	1800	1800	2164	2164	2365	2166	10.0	**CHi / CHir**
280.00	380.00	070412 17:54	070412 20:31	2.83E–07	2.92E–07	1800	3600	2913	2917	3116	2917	11.1	**CHi / CHir**
380.00	480.00	070412 22:07	070412 23:57	3.20E–05	3.37E–05	1800	1800	3660	3661	3862	3665	12.3	**CHi / CHir**
480.00	580.00	070413 06:20	070413 08:19	2.28E–06	2.32E–06	1800	1800	4403	4401	4602	4403	13.9	**CHi / CHir**
580.00	680.00	070413 10:28	070413 12:19	1.36E–05	1.57E–05	1800	1800	5142	5148	5345	5148	#NV	**CHi / CHir**
680.00	780.00	070413 15:02	070413 17:27	5.17E–07	7.33E–07	1800	1800	5878	5891	6091	5964	#NV	**CHi / CHir**
780.00	880.00	070413 19:23	070413 21:53	6.50E–07	7.50E–07	1800	3600	6596	6605	6801	6604	#NV	**CHi / CHir**
80.00	100.00	070414 19:23	070414 20:46	5.32E–05	5.57E–05	1200	1200	804	805	1003	803	7.7	**CHi / CHir**
100.00	120.00	070414 22:09	070414 23:32	4.90E–05	5.05E–05	1200	1200	954	954	1154	954	7.9	**CHi / CHir**
120.00	140.00	070415 00:09	070415 01:31	4.32E–04	4.92E–04	1200	1200	1105	1105	1137	1109	8.3	**CHi / CHir**
140.00	160.00	070415 07:52	070415 09:21	4.47E–05	4.65E–05	1200	1200	1257	1257	1457	1257	8.5	**CHi / CHir**
160.00	180.00	070415 10:15	070415 11:42	1.77E–06	1.85E–06	1200	1200	1409	1409	1609	1410	8.8	**CHi / CHir**
180.00	200.00	070415 12:35	070415 14:01	1.62E–05	1.67E–05	1200	1200	1561	1562	1762	1562	9.1	**CHi / CHir**
200.00	220.00	070415 14:59	070415 16:43	5.00E–08	5.17E–08	1200	1200	1714	1721	1921	1719	9.3	**–**
220.00	240.00	070415 17:16	070415 19:09	8.33E–08	9.20E–08	1200	1200	1865	1867	2067	1876	9.5	**CHi / CHir**
240.00	260.00	070415 19:47	070415 22:15	3.33E–08	3.77E–08	1200	3600	2016	2019	2215	2015	9.8	**CHi / CHir**
260.00	280.00	070415 22:53	070416 00:21	1.60E–04	1.72E–04	1200	1200	2163	2164	2456	2170	10.0	**CHi / CHir**
280.00	300.00	070416 00:56	070416 04:49	2.05E–08	3.60E–08	1200	7200	2314	2351	2549	2346	10.2	**CHi / CHir**
300.00	320.00	070416 06:46	070416 07:39	#NV	#NV	#NV	#NV	2462	#NV	#NV	#NV	10.4	**–**
320.00	340.00	070416 08:19	070416 10:26	#NV	9.80E–07	10	4860	2612	2620	2831	2631	10.7	**Pi**
340.00	360.00	070416 11:08	070416 11:57	#NV	#NV	#NV	#NV	2764	#NV	#NV	#NV	10.9	**–**
360.00	380.00	070416 13:33	070416 15:03	3.17E–07	3.32E–07	1200	1200	2916	2920	3119	2919	11.1	**CHi / CHir**
380.00	400.00	070416 15:49	070416 17:16	2.47E–05	2.60E–05	1200	1200	3067	3070	3292	3072	11.4	**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
400.00	420.00	070416 17:49	070416 19:13	1.43E–05	1.49E–05	1200	1200	3219	3222	3422	3223	11.6	**CHi / CHir**
420.00	440.00	070416 19:51	070416 20:47	#NV	#NV	#NV	#NV	3369	#NV	#NV	#NV	11.8	**–**
440.00	460.00	070416 22:04	070416 23:37	4.00E–07	4.67E–07	1200	1200	3517	3520	3720	3543	12.1	**CHi / CHir**
460.00	480.00	070417 00:11	070417 05:32	8.00E–08	8.42E–08	1200	14400	3662	3669	3865	3663	12.3	**CHi / CHir**
480.00	500.00	070417 06:50	070417 07:38	#NV	#NV	#NV	#NV	3808	#NV	#NV	#NV	12.5	**–**
500.00	520.00	070417 08:22	070417 09:52	2.92E–06	3.02E–06	1200	1200	3957	3957	4157	3958	12.7	**CHi / CHir**
520.00	540.00	070417 10:40	070417 11:29	#NV	#NV	#NV	#NV	4106	#NV	#NV	#NV	13.0	**–**
540.00	560.00	070417 13:13	070417 14:02	#NV	#NV	#NV	#NV	4255	#NV	#NV	#NV	13.2	**–**
560.00	580.00	070417 14:39	070417 15:28	#NV	#NV	#NV	#NV	4404	#NV	#NV	#NV	13.4	**–**
580.00	600.00	070417 17:01	070417 17:56	#NV	#NV	#NV	#NV	4553	#NV	#NV	#NV	13.7	**–**
600.00	620.00	070417 18:29	070417 19:23	#NV	#NV	#NV	#NV	4700	#NV	#NV	#NV	13.9	**–**
620.00	640.00	070417 19:54	070417 21:59	2.05E–05	2.32E–05	1200	3600	4847	4849	5078	4849	14.2	**CHi / CHir**
640.00	660.00	070417 22:57	070417 23:59	#NV	#NV	#NV	#NV	4700	#NV	#NV	#NV	14.4	**–**
660.00	680.00	070418 00:38	070418 05:25	#NV	2.17E–06	10	14400	5138	5146	5373	5342	14.6	**Pi**
680.00	700.00	070418 06:55	070418 07:46	#NV	#NV	#NV	#NV	5285	#NV	#NV	#NV	14.9	**CHi / CHir**
700.00	720.00	070418 08:32	070418 10:34	2.67E–07	4.88E–07	1200	2400	5432	5448	5648	5540	15.1	**CHi / CHir**
720.00	740.00	070418 11:25	070418 13:21	1.67E–07	2.52E–07	1200	2400	5579	5600	5799	5628	15.4	**CHi / CHir**
740.00	760.00	070418 14:06	070418 16:13	1.67E–08	5.20E–08	1200	1200	5727	5744	5938	5791	15.6	**Pi / CHir**
760.00	780.00	070418 16:45	070418 18:35	1.83E–07	2.30E–07	1200	1200	5870	5889	6089	5921	15.8	**CHi / CHir**
780.00	800.00	070418 19:14	070418 22:09	8.33E–08	1.21E–07	1200	5400	6015	6034	6236	6061	16.1	**CHi / CHir**
800.00	820.00	070418 23:25	070419 01:11	1.00E–07	1.31E–07	1200	1200	6164	6177	6378	6206	16.3	**CHi / CHir**
820.00	840.00	070419 01:51	070419 02:43	#NV	#NV	#NV	#NV	6306	#NV	#NV	#NV	16.6	**–**
840.00	860.00	070419 07:59	070419 09:31	5.33E–07	5.98E–07	1200	1200	6450	6457	6655	6459	16.8	**CHi / CHir**
860.00	880.00	070419 10:19	070419 13:12	2.83E–08	2.83E–08	1200	3600	6590	6617	6804	6646	17.0	**CHi / CHir**
880.00	900.00	070419 14:46	070419 15:34	#NV	#NV	#NV	#NV	6739	#NV	#NV	#NV	17.2	**–**
900.00	920.00	070419 16:30	070419 17:21	#NV	#NV	#NV	#NV	6881	#NV	#NV	#NV	17.5	**–**
920.00	940.00	070419 17:52	070419 18:22	#NV	#NV	#NV	#NV	7026	#NV	#NV	#NV	17.7	**–**

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
940.00	960.00	070419 20:42	070419 21:31	#NV	#NV	#NV	#NV	7171	#NV	#NV	#NV	17.9	**–**
955.00	975.00	070419 22:03	070419 22:53	#NV	#NV	#NV	#NV	7278	#NV	#NV	#NV	18.1	**–**
380.00	385.00	070421 12:18	070421 14:33	1.10E–07	1.29E–07	1200	1200	2953	2955	3178	2955	11.1	**CHi / CHir**
385.00	390.00	070421 15:06	070421 16:31	2.00E–05	2.07E–05	1200	1200	2991	2992	3192	2993	11.2	**CHi / CHir**
390.00	395.00	070421 16:56	070421 18:20	1.38E–05	1.43E–05	1200	1200	3028	3030	3246	3030	11.3	**CHi / CHir**
395.00	400.00	070421 18:45	070421 20:28	#NV	#NV	10	3600	3065	3091	3287	3106	11.3	**Pi**
400.00	405.00	070421 21:08	070421 22:31	9.17E–06	9.50E–06	1200	1200	3102	3104	3314	3105	11.4	**CHi / CHir**
405.00	410.00	070421 22:58	070421 23:47	#NV	#NV	#NV	#NV	3140	#NV	#NV	#NV	11.4	**–**
410.00	415.00	070422 00:11	070422 01:33	6.17E–06	6.23E–06	1200	1200	3177	3180	3379	3180	11.5	**CHi / CHir**
415.00	420.00	070422 06:38	070422 07:26	#NV	#NV	#NV	#NV	3215	#NV	#NV	#NV	11.5	**–**
440.00	445.00	070422 08:18	070422 10:14	5.83E–08	6.77E–08	1200	1200	3401	3448	3670	3452	11.8	**CHi / CHir**
445.00	450.00	070422 10:48	070422 11:37	#NV	#NV	#NV	#NV	3439	#NV	#NV	#NV	11.9	**–**
450.00	455.00	070422 13:05	070422 14:33	2.83E–07	3.13E–07	1200	1200	3476	3477	3677	3494	12.0	**CHi / CHir**
455.00	460.00	070422 15:03	070422 16:45	1.33E–07	1.53E–07	1200	1200	3511	3518	3718	3525	12.0	**CHi / CHir**
460.00	465.00	070422 17:10	070422 18:37	5.00E–08	5.50E–08	1200	1200	3549	3557	3759	3559	12.1	**CHi / CHir**
465.00	470.00	070422 19:02	070422 20:50	4.17E–08	4.50E–08	1200	1200	3585	3594	3821	3594	12.1	**CHi / CHir**
470.00	475.00	070422 21:41	070422 23:12	3.33E–08	3.67E–08	1200	1200	3625	3637	3849	3647	12.2	**CHi / CHir**
475.00	480.00	070422 23:36	070423 00:24	#NV	#NV	#NV	#NV	3662	#NV	#NV	#NV	12.2	**–**
500.00	505.00	070423 00:58	070423 02:17	3.17E–06	3.37E–06	1200	1200	3849	3848	4050	3848	12.5	**CHi / CHir**
505.00	510.00	070423 06:34	070423 07:23	#NV	#NV	#NV	#NV	3885	#NV	#NV	#NV	12.6	**–**
510.00	515.00	070423 07:57	070423 08:45	#NV	#NV	#NV	#NV	3920	#NV	#NV	#NV	12.6	**–**
515.00	520.00	070423 09:17	070423 10:05	#NV	#NV	#NV	#NV	3958	#NV	#NV	#NV	12.7	**–**
620.00	625.00	070423 13:19	070423 14:08	#NV	#NV	#NV	#NV	4735	#NV	#NV	#NV	14.0	**–**
623.00	628.00	070423 14:31	070423 16:01	5.00E–08	6.00E–08	1200	1200	4758	4763	4987	4763	#NV	**CHi / CHir**
628.00	633.00	070423 16:25	070423 17:57	1.88E–05	2.07E–05	1200	1200	4794	4800	5002	4798	#NV	**CHi / CHir**
630.00	635.00	070423 18:21	070423 19:41	1.92E–05	2.11E–05	1200	1200	4808	4812	5012	4813	#NV	**CHi / CHir**
635.00	640.00	070423 20:25	070423 22:02	2.00E–08	2.17E–08	1200	1200	4844	4863	5073	4861	#NV	**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**
660.00	665.00	070423 22:41	070423 23:30	#NV	#NV	#NV	#NV	5027	#NV	#NV	#NV	#NV	–
665.00	670.00	070423 23:55	070424 01:02	#NV	#NV	#NV	#NV	5064	#NV	#NV	#NV	#NV	–
670.00	675.00	070424 01:07	070424 01:55	#NV	#NV	#NV	#NV	5100	#NV	#NV	#NV	#NV	–
675.00	680.00	070424 06:35	070424 07:25	#NV	#NV	#NV	#NV	5137	#NV	#NV	#NV	#NV	–
700.00	705.00	070424 08:09	070424 08:58	#NV	#NV	#NV	#NV	5321	#NV	#NV	#NV	#NV	–
705.00	710.00	070424 09:27	070424 12:06	2.50E–07	4.75E–07	1200	2400	5360	5373	5572	5465	#NV	**CHi / CHir**
710.00	715.00	070424 12:23	070424 13:15	#NV	#NV	#NV	#NV	5399	#NV	#NV	#NV	#NV	–
715.00	720.00	070424 13:42	070424 14:31	#NV	#NV	#NV	#NV	5435	#NV	#NV	#NV	#NV	–
720.00	725.00	070424 15:00	070424 15:49	#NV	#NV	#NV	#NV	5473	#NV	#NV	#NV	#NV	–
725.00	730.00	070424 16:16	070424 17:04	#NV	#NV	#NV	#NV	5508	#NV	#NV	#NV	#NV	–
730.00	735.00	070424 17:29	070424 18:18	#NV	#NV	#NV	#NV	5545	#NV	#NV	#NV	#NV	–
735.00	740.00	070424 18:46	070424 20:38	1.65E–07	2.12E–07	1200	2400	5580	5601	5800	5624	#NV	**CHi / CHir**
740.00	745.00	070424 21:17	070424 23:09	#NV	#NV	10	3720	5616	5618	5827	5633	#NV	**Pi**
745.00	750.00	070424 23:35	070425 00:24	#NV	#NV	#NV	#NV	5651	#NV	#NV	#NV	#NV	–
750.00	755.00	070425 00:48	070425 01:37	#NV	#NV	#NV	#NV	5688	#NV	#NV	#NV	#NV	–
755.00	760.00	070425 06:31	070425 07:20	#NV	#NV	#NV	#NV	5726	#NV	#NV	#NV	#NV	–
760.00	765.00	070425 07:45	070425 08:33	#NV	#NV	#NV	#NV	5762	#NV	#NV	#NV	#NV	–
765.00	770.00	070425 09:00	070425 10:53	#NV	4.16E–07	9	3600	5800	5825	6027	5831	#NV	**Pi**
770.00	775.00	070425 13:20	070425 17:15	1.15E–07	1.47E–07	1200	1200	5840	5854	6044	5879	#NV	**CHi / CHir**
775.00	780.00	070425 17:38	070425 19:01	5.67E–08	6.50E–08	1200	1200	5876	5900	6080	5927	#NV	**CHi / CHir**
780.00	785.00	070425 19:31	070425 21:08	#NV	#NV	#NV	#NV	5913	#NV	#NV	#NV	#NV	–
785.00	790.00	070425 21:31	070425 22:19	#NV	#NV	#NV	#NV	5945	#NV	#NV	#NV	#NV	–
790.00	795.00	070425 22:42	070426 00:12	7.33E–08	1.05E–07	1200	1200	5980	5997	6187	6058	#NV	**CHi / CHir**
795.00	800.00	070426 00:40	070426 01:26	#NV	#NV	#NV	#NV	6016	#NV	#NV	#NV	#NV	–
800.00	805.00	070426 06:31	070426 07:20	#NV	#NV	#NV	#NV	6050	#NV	#NV	#NV	#NV	–
805.00	810.00	070426 12:24	070426 13:13	#NV	#NV	#NV	#NV	6089	#NV	#NV	#NV	#NV	–
810.00	815.00	070426 13:40	070426 15:11	8.33E–08	1.17E–07	1200	1200	6127	6143	6343	6170	#NV	**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
815.00	820.00	070426 15:35	070426 16:24	#NV	#NV	#NV	#NV	6164	#NV	#NV	#NV	#NV	**–**
840.00	845.00	070426 17:00	070426 18:41	1.67E–08	1.83E–08	1200	1200	6347	6400	6564	6419	#NV	**CHi / CHir**
845.00	850.00	070426 19:05	070426 20:28	1.67E–07	1.83E–07	1200	1200	6385	6391	6630	6392	#NV	**CHi / CHir**
850.00	855.00	070426 21:12	070426 22:01	#NV	#NV	#NV	#NV	6418	#NV	#NV	#NV	#NV	**–**
855.00	860.00	070426 22:24	070426 23:47	1.67E–07	1.93E–07	1200	1200	6454	6462	6662	6468	#NV	**CHi / CHir**
860.00	865.00	070427 00:09	070427 01:16	#NV	#NV	#NV	#NV	6489	#NV	#NV	#NV	#NV	**–**
865.00	870.00	070427 01:20	070427 03:30	2.17E–08	2.52E–08	1200	3600	6526	6547	6728	6548	#NV	**CHi / Chir**
870.00	875.00	070427 06:28	070427 07:17	#NV	#NV	#NV	#NV	6557	#NV	#NV	#NV	#NV	**–**
875.00	880.00	070427 07:43	070427 08:23	#NV	#NV	#NV	#NV	6595	#NV	#NV	#NV	#NV	**–**
970.00	1000.43	070428 10:58	070428 13:52	6.67E–07	7.17E–07	1200	2400	7275	7301	7501	7301	#NV	**CHi / CHir**

Nomenclature

Q_p	Flow in test section immediately before stop of flow (m^3/s).
Q_m	Arithmetical mean flow during perturbation phase (m^3/s).
t_p	Duration of perturbation phase (s).
t_f	Duration of recovery phase (s).
p_0	Pressure in borehole before packer inflation (kPa).
p_i	Pressure in test section before start of flowing (kPa).
p_p	Pressure in test section before stop of flowing (kPa).
p_F	Pressure in test section at the end of the recovery (kPa).
Te_w	Temperature in test section.
Test phases	CHi: Constant Head injection phase. CHir: Recovery phase following the constant head injection phase. Pi: Pulse injection phase.
#NV	Not analysed/no values.

Table 6-2. Results from analysis of hydraulic tests in KLX15A (for nomenclature see Appendix 4 and below).

Interval position		Stationary flow parameters		Transient analysis Flow regime		Formation parameters											Static conditions	
up	low	Q/s	T_M	Perturb. phase	Recovery phase	T_{f1}	T_{f2}	T_{s1}	T_{s2}	T_T	T_{TMIN}	T_{TMAX}	C	ξ	dt_1	dt_2	p*	h_{wif}
m btoc	m btoc	m²/s	m²/s			m²/s	m²/s	m²/s	m²/s	m²/s	m²/s	m²/s	m³/Pa	–	min	min	kPa	m.a.s.l.
80.00	180.00	1.2E–04	1.6E–04	2	WBS2	7.7E–05	#NV	1.3E–04	#NV	7.7E–05	3.0E–05	3.0E–04	1.5E–07	2.7	3.05	22.79	1407.6	7.34
180.00	280.00	6.3E–06	8.2E–06	22	WBS22	8.2E–06	2.4E–05	1.4E–05	#NV	1.4E–05	5.0E–06	3.0E–05	4.8E–08	4.1	9.25	21.12	2157.8	6.98
280.00	380.00	1.4E–08	1.8E–08	22	WBS22	1.9E–08	#NV	6.0E–08	#NV	1.9E–08	5.0E–09	6.0E–08	2.7E–10	3.5	3.11	23.20	2916.3	7.95
380.00	480.00	1.6E–06	2.0E–06	22	WBS22	2.5E–06	#NV	2.8E–06	#NV	2.8E–06	8.0E–05	5.0E–06	2.5E–09	3.0	2.15	8.98	3657.5	7.65
480.00	580.00	1.1E–07	1.5E–07	22	WBS22	2.9E–07	#NV	2.7E–07	#NV	2.9E–07	3.0E–08	7.0E–07	1.3E–10	9.7	1.11	23.06	4403.1	8.48
580.00	680.00	6.8E–07	8.8E–07	2	WBS2	1.4E–07	7.2E–07	1.5E–07	1.6E–06	1.5E–07	1.0E–07	3.0E–06	3.0E–10	–4.7	1.81	4.43	5145.1	9.53
680.00	780.00	2.5E–08	3.3E–08	#NV	WBS22	1.9E–08	7.0E–09	2.2E–08	7.2E–09	2.2E–08	5.0E–09	5.0E–08	5.0E–10	–3.1	1.03	3.41	#NV	#NV
780.00	880.00	3.3E–08	4.2E–08	2	WBS2	2.6E–08	#NV	3.7E–08	#NV	3.7E–08	1.0E–08	8.0E–08	2.7E–10	0.6	10.58	47.17	6601.3	11.04
80.00	100.00	2.6E–06	2.8E–06	2	WBS2	2.9E–06	6.6E–06	2.0E–06	3.5E–06	2.9E–06	7.0E–07	8.0E–06	6.4E–10	–2.1	0.33	3.44	801.0	7.38
100.00	120.00	2.4E–06	2.5E–06	2	WBS2	3.5E–06	6.6E–06	4.1E–06	1.1E–05	4.1E–06	1.0E–06	2.0E–05	7.8E–10	3.5	0.31	0.62	950.5	7.10
120.00	140.00	1.3E–04	1.4E–04	2	WBS2	7.0E–05	#NV	1.1E–04	5.7E–05	1.1E–04	3.0E–05	3.0E–04	2.5E–08	–5.1	0.15	2.58	1105.9	7.46
140.00	160.00	2.2E–06	2.3E–06	2	WBS2	1.1E–06	3.6E–06	1.6E–06	1.1E–05	3.6E–06	8.0E–07	3.0E–05	1.9E–09	–3.2	2.49	9.29	1256.9	7.41
160.00	180.00	8.7E–08	9.1E–08	2	WBS2	1.4E–07	#NV	2.9E–07	#NV	1.4E–07	7.0E–08	6.0E–07	3.9E–10	3.9	1.00	16.97	1408.5	7.44
180.00	200.00	7.9E–07	8.3E–07	2	WBS22	3.2E–07	1.6E–06	3.5E–06	#NV	1.6E–06	2.0E–07	5.0E–06	5.1E–10	–3.0	2.92	14.23	1561.9	7.65
200.00	220.00	2.5E–09	2.6E–09	#NV	#NV	2.6E–09	#NV	2.3E–09	#NV	2.6E–09	8.0E–10	5.0E–09	5.1E–11	2.5	0.49	13.40	1700.2	6.34
220.00	240.00	4.1E–09	4.3E–09	22	WBS22	1.2E–09	5.5E–09	8.5E–10	1.8E–09	5.5E–09	7.0E–10	7.0E–09	6.9E–11	–1.7	#NV	#NV	1847.1	5.95
240.00	260.00	1.7E–09	1.8E–09	2	WBS2	1.2E–09	#NV	3.6E–09	#NV	3.6E–09	8.0E–10	5.0E–09	6.2E–11	2.5	#NV	#NV	2006.1	6.82
260.00	280.00	5.4E–06	5.6E–06	22	WBS22	5.5E–06	1.2E–05	1.1E–05	#NV	1.1E–05	8.0E–06	3.0E–05	4.6E–08	4.2	#NV	#NV	2159.2	7.12
280.00	300.00	1.0E–09	1.1E–09	2	WBS2	3.4E–10	#NV	2.1E–10	#NV	3.4E–10	1.0E–10	3.0E–09	1.3E–10	–1.5	2.29	13.95	2301.1	7.98
300.00	320.00	#NV	#NV	2	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
320.00	340.00	#NV	#NV	2	WB2	#NV	#NV	4.4E–10	1.8E–10	4.4E–10	1.0E–10	8.0E–10	4.5E–11	–0.6	1.48	8.63	#NV	#NV
340.00	360.00	#NV	#NV	22	WBS2	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
360.00	380.00	1.6E–08	1.6E–08	2	WBS2	2.2E–08	#NV	6.9E–08	#NV	2.2E–08	7.0E–09	8.0E–08	4.5E–11	3.6	1.17	15.26	2918.2	8.14
380.00	400.00	1.1E–06	1.1E–06	2	WBS2	1.9E–06	#NV	2.4E–06	#NV	2.4E–06	8.0E–07	5.0E–06	2.4E–09	5.6	3.79	16.15	3067.2	8.12
400.00	420.00	7.0E–07	7.3E–07	22	WBS22	8.8E–07	#NV	1.9E–06	#NV	1.9E–06	5.0E–07	4.0E–06	2.4E–10	8.7	0.46	10.58	3220.8	8.57
420.00	440.00	#NV	#NV	2	WBS22	#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 m²/s	T_M m²/s	Perturb. phase	Recovery phase	T_{f1} m²/s	T_{f2} m²/s	T_{s1} m²/s	T_{s2} m²/s	T_T m²/s	T_{TMIN} m²/s	T_{TMAX} m²/s	C m³/Pa	ξ –	dt_1 min	dt_2 min	p* kPa	h_{wif} m.a.s.l.
440.00	460.00	2.0E–08	2.1E–08	2	WBS2	1.1E–08	#NV	1.4E–08	#NV	1.4E–08	8.0E–09	3.0E–08	9.5E–11	–1.2	3.96	14.14	3526.8	9.44
460.00	480.00	4.0E–09	4.2E–09	2	WBS22	2.6E–09	#NV	6.1E–09	2.0E–09	6.1E–09	1.0E–09	1.0E–08	5.3E–11	4.9	12.85	29.99	3661.1	8.01
480.00	500.00	#NV	#NV	2	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
500.00	520.00	1.4E–07	1.5E–07	#NV	#NV	4.8E–07	#NV	3.4E–07	#NV	4.8E–07	1.0E–07	8.0E–07	3.6E–11	13.9	1.52	15.14	3957.5	8.09
520.00	540.00	#NV	#NV	2	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
540.00	560.00	#NV	#NV	2	WBS2	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
560.00	580.00	#NV	#NV	2	WBS2	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
580.00	600.00	#NV	#NV	22	WBS2	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
600.00	620.00	#NV	#NV	22	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
620.00	640.00	8.8E–07	9.2E–07	2	WBS22	1.3E–07	6.5E–07	2.3E–07	1.5E–06	2.3E–07	8.0E–08	3.0E–06	9.7E–10	–4.6	1.85	4.33	4845.7	8.80
640.00	660.00	#NV	#NV	2	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
660.00	680.00	#NV	#NV	2	WBS2	#NV	#NV	3.9E–10	2.3E–12	3.9E–10	1.0E–12	8.0E–10	5.1E–11	–1.8	#NV	#NV	#NV	#NV
680.00	700.00	#NV	#NV	2	WBS2	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
700.00	720.00	1.3E–08	1.4E–08	#NV	WBS22	4.0E–09	1.3E–09	8.1E–09	3.2E–09	8.1E–09	1.0E–09	3.0E–08	1.4E–10	–3.7	0.98	2.99	#NV	#NV
720.00	740.00	8.2E–09	8.6E–09	22	WBS22	3.9E–09	2.0E–09	4.2E–09	2.1E–09	4.2E–09	1.0E–09	1.0E–08	1.5E–10	–2.6	1.18	4.69	5586.4	10.46
740.00	760.00	8.4E–10	8.8E–10	#NV	#NV	#NV	#NV	6.1E–10	#NV	6.1E–10	2.0E–10	1.0E–09	8.4E–11	–1.7	#NV	#NV	5731.5	10.13
760.00	780.00	9.0E–09	9.4E–09	#NV	#NV	3.7E–09	#NV	3.0E–09	#NV	3.0E–09	8.0E–10	6.0E–09	5.0E–11	–2.6	1.87	17.43	5881.5	10.72
780.00	800.00	4.1E–09	4.2E–09	22	WBS22	1.0E–09	#NV	2.3E–09	9.1E–10	2.3E–09	7.0E–10	5.0E–09	1.3E–10	–1.9	2.33	10.66	#NV	#NV
800.00	820.00	4.9E–09	5.1E–09	2	WBS22	1.8E–09	#NV	3.8E–09	1.9E–09	3.8E–09	1.0E–09	8.0E–09	5.7E–11	–0.9	0.98	6.30	6163.3	10.13
820.00	840.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
840.00	860.00	2.6E–08	2.8E–08	#NV	#NV	3.0E–08	#NV	6.1E–08	#NV	6.1E–08	2.0E–08	1.0E–07	3.9E–11	7.7	2.11	15.68	6453.7	10.55
860.00	880.00	1.5E–09	1.6E–09	#NV	#NV	1.4E–09	#NV	1.3E–09	#NV	1.4E–09	5.0E–10	6.0E–09	6.1E–11	2.6	0.64	9.44	6616.6	12.59
880.00	900.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
900.00	920.00	#NV	#NV	2	WBS2	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
920.00	940.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
940.00	960.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
955.00	975.00	#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	T_M 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.
380.00	385.00	4.8E–09	4.0E–09	2	WBS2	7.1E–09	2.4E–09	2.3E–08	#NV	7.1E–09	1.0E–09	4.0E–08	1.7E–11	3.2	0.2	2.5	2954.4	8.03
385.00	390.00	9.8E–07	8.1E–07	#NV	#NV	2.6E–06	#NV	2.4E–06	#NV	2.6E–06	1.0E–06	4.0E–06	2.2E–09	9.2	1.17	13.01	2989.7	7.82
390.00	395.00	6.3E–07	5.2E–07	#NV	#NV	9.1E–07	#NV	1.3E–06	#NV	9.1E–07	5.0E–07	2.0E–06	2.2E–09	2.2	0.59	16.60	3027.3	7.85
395.00	400.00	#NV	#NV	2	WBS2	#NV	#NV	3.5E–11	#NV	3.5E–11	1.0E–11	8.0E–11	1.7E–11	–0.5	9.09	55.39	#NV	#NV
400.00	405.00	4.3E–07	3.5E–07	#NV	#NV	1.4E–06	#NV	1.5E–06	#NV	1.5E–06	8.0E–07	3.0E–06	3.0E–10	14.4	1.11	11.06	3103.1	7.97
405.00	410.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
410.00	415.00	3.0E–07	2.5E–07	#NV	WBS2	9.4E–07	#NV	1.4E–06	#NV	9.4E–07	5.0E–07	3.0E–06	2.6E–11	12.5	1.11	18.49	3178.6	8.11
415.00	420.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
440.00	445.00	2.6E–09	2.1E–09	#NV	WBS2	1.2E–09	#NV	7.8E–10	#NV	7.8E–10	5.0E–10	3.0E–09	2.6E–11	–1.7	1.83	15.58	3405.1	8.39
445.00	450.00	#NV	#NV	2	WBS2	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
450.00	455.00	1.4E–08	1.2E–08	22	WBS22	1.2E–08	#NV	3.0E–08	1.5E–08	1.2E–08	8.0E–09	4.0E–08	2.0E–11	0.4	2.41	18.73	3481.8	8.63
455.00	460.00	6.5E–09	5.4E–09	2	WBS2	2.9E–09	9.6E–09	6.2E–10	2.4E–09	2.9E–09	7.0E–10	6.0E–09	1.9E–11	–1.4	1.22	3.88	#NV	#NV
460.00	465.00	2.4E–09	2.0E–09	2	WBS2	2.5E–09	#NV	5.4E–09	#NV	5.4E–09	2.0E–09	8.0E–09	1.4E–11	8.2	8.83	18.86	3554.5	8.48
465.00	470.00	1.8E–09	1.5E–09	2	WBS22	2.3E–09	#NV	2.9E–09	#NV	2.9E–09	1.0E–09	5.0E–09	1.8E–11	5.4	12.32	35.18	3589.7	8.29
470.00	475.00	1.5E–09	1.3E–09	#NV	#NV	1.7E–09	#NV	1.2E–09	#NV	1.2E–09	8.0E–10	3.0E–09	1.6E–11	0.9	#NV	#NV	3629.9	8.61
475.00	480.00	#NV	#NV	2	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
500.00	505.00	1.5E–07	1.3E–07	2	WBS22	2.3E–07	#NV	5.5E–07	#NV	2.3E–07	9.0E–08	6.0E–07	1.6E–11	2.8	0.89	16.16	3847.9	8.21
505.00	510.00	#NV	#NV	22	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
510.00	515.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
515.00	520.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
620.00	625.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
623.00	628.00	2.2E–09	1.8E–09	2	WBS2	1.9E–09	#NV	8.7E–09	#NV	1.9E–09	1.0E–09	1.0E–08	1.9E–11	1.0	1.31	14.93	4759.4	8.95
628.00	633.00	9.1E–07	7.5E–07	22	WBS22	3.4E–07	1.1E–06	2.6E–07	1.4E–06	3.4E–07	1.0E–07	2.0E–06	2.2E–10	–4.0	0.92	2.88	4793.4	8.69
630.00	635.00	9.4E–07	7.8E–07	2	WBS22	3.3E–07	1.7E–06	2.3E–07	1.3E–06	3.3E–07	2.0E–07	3.0E–06	2.8E–10	–4.1	1.30	2.43	4806.1	8.49
635.00	640.00	9.3E–10	7.7E–10	#NV	#NV	6.3E–10	#NV	1.7E–09	#NV	1.7E–09	4.0E–10	3.0E–09	2.2E–11	8.0	#NV	#NV	4852.9	9.54
660.00	665.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
665.00	670.00	#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	T_M 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.
670.00	675.00	#NV	#NV	2	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
675.00	680.00	#NV	#NV	2	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
700.00	705.00	#NV	#NV	2	WBS2	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
705.00	710.00	1.2E–08	1.0E–08	#NV	WBS2	4.4E–09	1.1E–09	1.4E–08	3.6E–09	1.4E–08	4.0E–09	3.0E–08	1.4E–10	–3.1	0.75	2.93	#NV	#NV
710.00	715.00	#NV	#NV	22	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
715.00	720.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
720.00	725.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
725.00	730.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
730.00	735.00	#NV	#NV	22	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
735.00	740.00	8.1E–09	6.7E–09	2	WBS22	8.9E–09	3.7E–09	3.6E–09	1.8E–09	3.6E–09	1.0E–09	1.0E–08	5.2E–12	–2.6	0.69	2.30	5585.8	10.01
740.00	745.00	#NV	#NV	2	WBS22	#NV	#NV	1.8E–10	8.0E–11	1.8E–10	6.0E–11	3.0E–10	1.3E–11	–0.9	#NV	#NV	#NV	#NV
745.00	750.00	#NV	#NV	22	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
750.00	755.00	#NV	#NV	22	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
755.00	760.00	#NV	#NV	2	WBS2	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
760.00	765.00	#NV	#NV	22	WBS2	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
765.00	770.00	#NV	#NV	2	WBS2	#NV	#NV	2.5E–10	1.1E–10	2.5E–10	8.0E–11	5.0E–10	2.1E–11	–1.0	#NV	#NV	#NV	#NV
770.00	775.00	5.9E–09	4.9E–09	2	WBS2	2.6E–09	#NV	1.2E–09	#NV	2.6E–09	7.0E–10	6.0E–09	1.0E–11	–1.8	1.48	15.01	5843.5	10.52
775.00	780.00	3.1E–09	2.6E–09	22	WBS22	3.4E–09	#NV	6.8E–09	2.4E–09	6.8E–09	2.0E–09	9.0E–09	1.8E–11	5.4	3.68	7.19	5909.7	13.60
780.00	785.00	#NV	#NV	2	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
785.00	790.00	#NV	#NV	2	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
790.00	795.00	3.8E–09	3.1E–09	22	WBS22	2.5E–09	1.0E–09	2.2E–09	1.2E–09	2.2E–09	5.0E–10	5.0E–09	6.5E–11	–2.1	1.56	5.45	6009.0	12.71
795.00	800.00	#NV	#NV	2	WBS2	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
800.00	805.00	#NV	#NV	#NV	WBS2	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
805.00	810.00	#NV	#NV	2	WBS2	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
810.00	815.00	4.1E–09	3.4E–09	2	WBS2	4.1E–09	1.8E–09	4.9E–09	2.2E–09	4.9E–09	1.0E–09	8.0E–09	1.4E–11	–0.2	0.83	2.03	6137.8	11.18
815.00	820.00	#NV	#NV	2	WBS2	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
840.00	845.00	1.0E–09	8.2E–10	22	WBS22	6.7E–10	#NV	1.7E–09	#NV	1.7E–09	4.0E–10	5.0E–09	2.6E–11	5.2	#NV	#NV	6411.2	17.15

Interval position		Stationary flow parameters		Transient analysis														
				Flow regime		Formation parameters											Static conditions	
up m btoc	low m btoc	Q/s m^2/s	T_M 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.
845.00	850.00	6.8E–09	5.7E–09	2	WBS2	9.9E–09	#NV	2.4E–08	#NV	2.4E–08	6.0E–09	7.0E–08	1.2E–11	16.0	#NV	#NV	6391.7	11.52
850.00	855.00	#NV	#NV	2	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
855.00	860.00	8.8E–09	6.8E–09	2	WBS2	8.2E–09	#NV	1.4E–08	5.7E–09	1.4E–08	4.0E–09	3.0E–08	1.3E–11	3.3	0.75	2.14	6447.4	9.91
860.00	865.00	#NV	#NV	2	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
865.00	870.00	1.2E–09	9.7E–10	#NV	#NV	1.7E–09	#NV	4.4E–09	#NV	4.4E–09	8.0E–10	7.0E–09	2.0E–11	15.7	#NV	#NV	6546.8	12.76
870.00	875.00	#NV	#NV	2	WBS22	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
875.00	880.00	#NV	#NV	22	WBS2	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
970.00	1000.43	3.3E–08	3.6E–08	22	WBS22	3.6E–08	1.8E–08	8.3E–08	2.1E–08	8.3E–08	4.0E–08	3.0E–07	6.9E–11	7.4	1.40	3.91	7289.6	12.07

Nomenclature

Q/s Specific capacity.

T_M Transmissivity according to /Moye 1967/.

Flow regime 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.

T_f Transmissivity derived from the analysis of the perturbation phase (CHi). In case a homogeneous flow model was used only one T_f value is reported, in case a two zone composite flow model was used both T_{f1} (inner zone) and T_{f2} (outer zone) are given.

T_s Transmissivity derived from the analysis of the recovery phase (CHir or Pi). In case a homogeneous flow model was used only one T_s value is reported, in case a two zone composite flow model was used both T_{s1} (inner zone) and T_{s2} (outer zone) are given.

T_T Recommended transmissivity.

T_{TMIN} Confidence range lower limit.

T_{TMAX} Confidence range upper limit.

C Wellbore storage coefficient.

ξ Skin factor (calculated based on a Storativity of $1 \cdot 10^{-6}$).

dt_1 Estimated start time of evaluation.

dt_2 Estimated stop time of evaluation.

p* 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.

h_{wif} Fresh-water head (based on transducer depth and p*).

#NV Not analysed/no values.

Table 6-3. Results from the ri-index calculation of hydraulic tests in KLX15A (see Section 4.5.5 for details and nomenclature).

Borehole secup (m)	Borehole seclow (m)	Recommended transmissivity T_T (m²/s)	Time t_2 for radius of influence calculation (s)	ri-index (–)	Radius of influence (m)
80.00	180.00	7.7E–05	1,800	0	283.90
180.00	280.00	1.4E–05	1,800	–1	185.72
280.00	380.00	1.9E–08	1,800	0	35.72
380.00	480.00	2.8E–06	1,800	–1	123.64
480.00	580.00	2.9E–07	1,800	0	70.33
580.00	680.00	1.5E–07	266	–1	22.92
680.00	780.00	2.2E–08	205	1	12.40
780.00	880.00	3.7E–08	3,600	0	59.24
80.00	100.00	2.9E–06	206	–1	42.17
100.00	120.00	4.1E–06	37	–1	19.61
120.00	140.00	1.1E–04	155	1	91.84
140.00	160.00	3.6E–06	1,200	0	107.79
160.00	180.00	1.4E–07	1,200	0	47.52
180.00	200.00	1.6E–06	1,200	0	88.01
200.00	220.00	2.6E–09	1,200	0	17.62
220.00	240.00	5.5E–09	1,200	0	21.30
240.00	260.00	3.6E–09	3,600	–1	33.29
260.00	280.00	1.1E–05	1,200	0	143.47
280.00	300.00	3.4E–10	1,200	0	10.59
300.00	320.00	1.0E–11	#NV	#NV	#NV
320.00	340.00	4.4E–10	518	1	7.42
340.00	360.00	1.0E–11	#NV	#NV	#NV
360.00	380.00	2.2E–08	1,200	0	30.10
380.00	400.00	2.4E–06	1,200	0	97.50
400.00	420.00	1.9E–06	1,200	0	91.99
420.00	440.00	1.0E–11	#NV	#NV	#NV
440.00	460.00	1.4E–08	1,200	0	26.97
460.00	480.00	6.1E–09	1,799	1	26.78
480.00	500.00	1.0E–11	#NV	#NV	#NV
500.00	520.00	4.8E–07	1,200	0	65.13
520.00	540.00	1.0E–11	#NV	#NV	#NV
540.00	560.00	1.0E–11	#NV	#NV	#NV
560.00	580.00	1.0E–11	#NV	#NV	#NV
580.00	600.00	1.0E–11	#NV	#NV	#NV
600.00	620.00	1.0E–11	#NV	#NV	#NV
620.00	640.00	2.3E–07	260	–1	25.22
640.00	660.00	1.0E–11	#NV	#NV	#NV
660.00	680.00	3.9E–10	#NV	1	#NV
680.00	700.00	1.0E–11	#NV	#NV	#NV
700.00	720.00	8.1E–09	179	1	9.07
720.00	740.00	4.2E–09	281	1	9.64
740.00	760.00	6.1E–10	1,200	0	12.27
760.00	780.00	3.0E–09	1,200	0	18.36
780.00	800.00	2.3E–09	640	1	10.16
800.00	820.00	3.8E–09	378	1	10.92

Borehole secup (m)	Borehole seclow (m)	Recommended transmissivity T_T (m²/s)	Time t_2 for radius of influence calculation (s)	ri-index (–)	Radius of influence (m)
820.00	840.00	1.0E–11	#NV	#NV	#NV
840.00	860.00	6.1E–08	1,200	0	38.94
860.00	880.00	1.4E–09	1,200	0	15.14
880.00	900.00	1.0E–11	#NV	#NV	#NV
900.00	920.00	1.0E–11	#NV	#NV	#NV
920.00	940.00	1.0E–11	#NV	#NV	#NV
940.00	960.00	1.0E–11	#NV	#NV	#NV
955.00	975.00	1.0E–11	#NV	#NV	#NV
380.00	385.00	7.1E–09	147	1	7.96
385.00	390.00	2.6E–06	1,200	0	99.65
390.00	395.00	9.1E–07	1,200	0	76.45
395.00	400.00	3.5E–11	3,600	0	10.41
400.00	405.00	1.5E–06	1,200	0	87.03
405.00	410.00	1.0E–11	#NV	#NV	#NV
410.00	415.00	9.4E–07	1,200	0	77.05
415.00	420.00	1.0E–11	#NV	#NV	#NV
440.00	445.00	7.8E–10	1,200	0	13.09
445.00	450.00	1.0E–11	#NV	#NV	#NV
450.00	455.00	1.2E–08	1,200	0	26.01
455.00	460.00	2.9E–09	233	–1	8.00
460.00	465.00	5.4E–09	1,200	0	21.17
465.00	470.00	2.9E–09	1,200	0	18.21
470.00	475.00	1.2E–09	1,200	0	14.56
475.00	480.00	1.0E–11	#NV	#NV	#NV
500.00	505.00	2.3E–07	1,200	0	54.19
505.00	510.00	1.0E–11	#NV	#NV	#NV
510.00	515.00	1.0E–11	#NV	#NV	#NV
515.00	520.00	1.0E–11	#NV	#NV	#NV
620.00	625.00	1.0E–11	#NV	#NV	#NV
623.00	628.00	1.9E–09	1,200	0	16.38
628.00	633.00	3.4E–07	173	–1	22.68
630.00	635.00	3.3E–07	146	–1	20.69
635.00	640.00	1.7E–09	1,200	–1	15.89
660.00	665.00	1.0E–11	#NV	#NV	#NV
665.00	670.00	1.0E–11	#NV	#NV	#NV
670.00	675.00	1.0E–11	#NV	#NV	#NV
675.00	680.00	1.0E–11	#NV	#NV	#NV
700.00	705.00	1.0E–11	#NV	#NV	#NV
705.00	710.00	1.4E–08	176	1	10.34
710.00	715.00	1.0E–11	#NV	#NV	#NV
715.00	720.00	1.0E–11	#NV	#NV	#NV
720.00	725.00	1.0E–11	#NV	#NV	#NV
725.00	730.00	1.0E–11	#NV	#NV	#NV
730.00	735.00	1.0E–11	#NV	#NV	#NV
735.00	740.00	3.6E–09	138	1	6.49
740.00	745.00	1.8E–10	#NV	1	#NV
745.00	750.00	1.0E–11	#NV	#NV	#NV

Borehole secup (m)	Borehole seclow (m)	Recommended transmissivity T_T (m²/s)	Time t_2 for radius of influence calculation (s)	ri-index (–)	Radius of influence (m)
750.00	755.00	1.0E–11	#NV	#NV	#NV
755.00	760.00	1.0E–11	#NV	#NV	#NV
760.00	765.00	1.0E–11	#NV	#NV	#NV
765.00	770.00	2.5E–10	#NV	1	#NV
770.00	775.00	2.6E–09	1,200	0	17.62
775.00	780.00	6.8E–09	431	1	13.47
780.00	785.00	1.0E–11	#NV	#NV	#NV
785.00	790.00	1.0E–11	#NV	#NV	#NV
790.00	795.00	2.2E–09	327	1	8.84
795.00	800.00	1.0E–11	#NV	#NV	#NV
800.00	805.00	1.0E–11	#NV	#NV	#NV
805.00	810.00	1.0E–11	#NV	#NV	#NV
810.00	815.00	4.9E–09	122	1	6.60
815.00	820.00	1.0E–11	#NV	#NV	#NV
840.00	845.00	1.7E–09	1,200	–1	15.82
845.00	850.00	2.4E–08	1,200	–1	30.80
850.00	855.00	1.0E–11	#NV	#NV	#NV
855.00	860.00	1.4E–08	128	1	8.85
860.00	865.00	1.0E–11	#NV	#NV	#NV
865.00	870.00	4.4E–09	3,600	–1	34.91
870.00	875.00	1.0E–11	#NV	#NV	#NV
875.00	880.00	1.0E–11	#NV	#NV	#NV
970.00	1,000.43	8.3E–08	235	1	18.55

The Figures 6-1 to 6-3 present the transmissivity, conductivity and hydraulic freshwater head profiles.

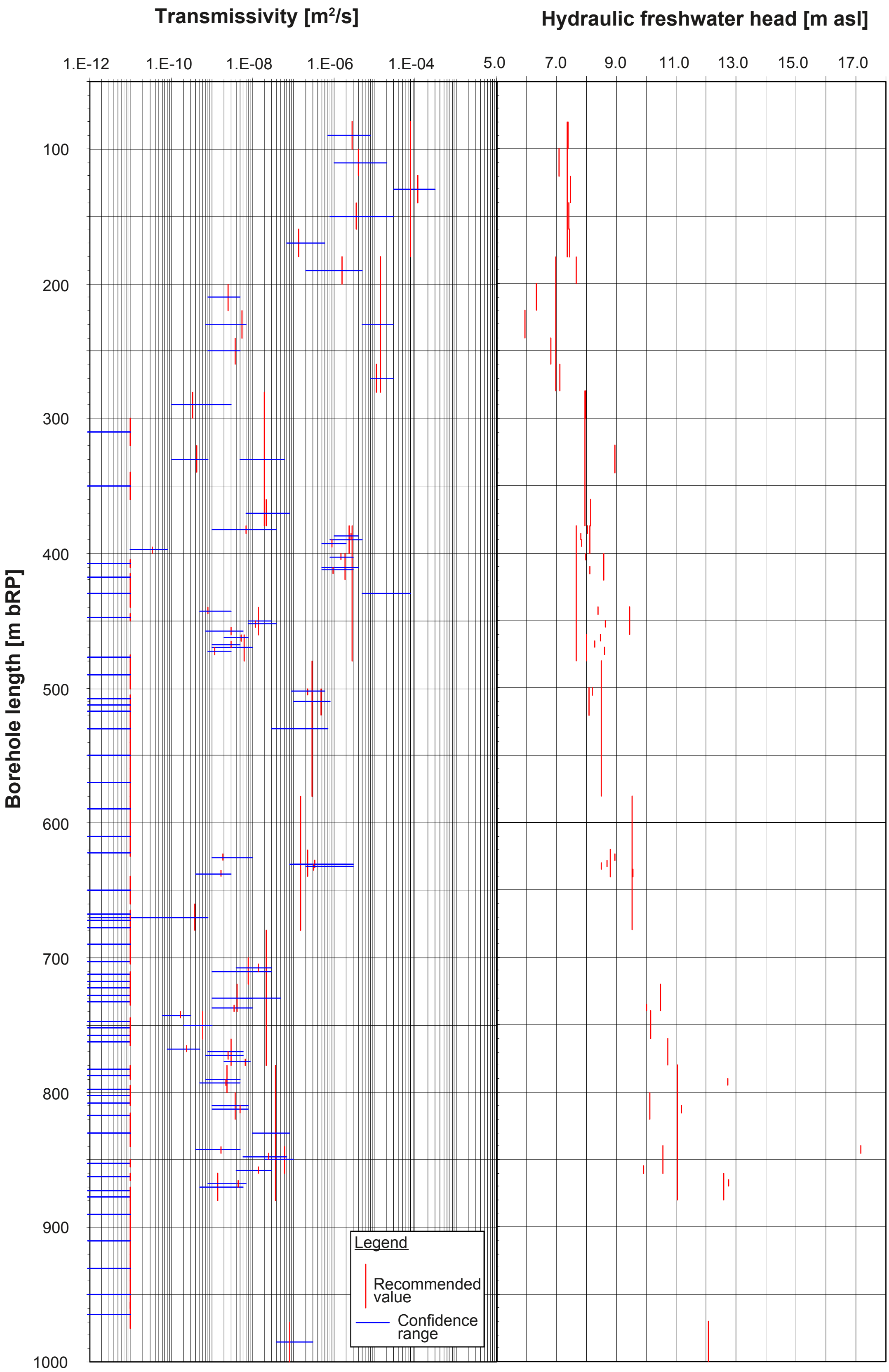


Figure 6-1. *Results summary – profiles of transmissivity and equivalent freshwater head, transmissivities derived from injection tests, freshwater head extrapolated*

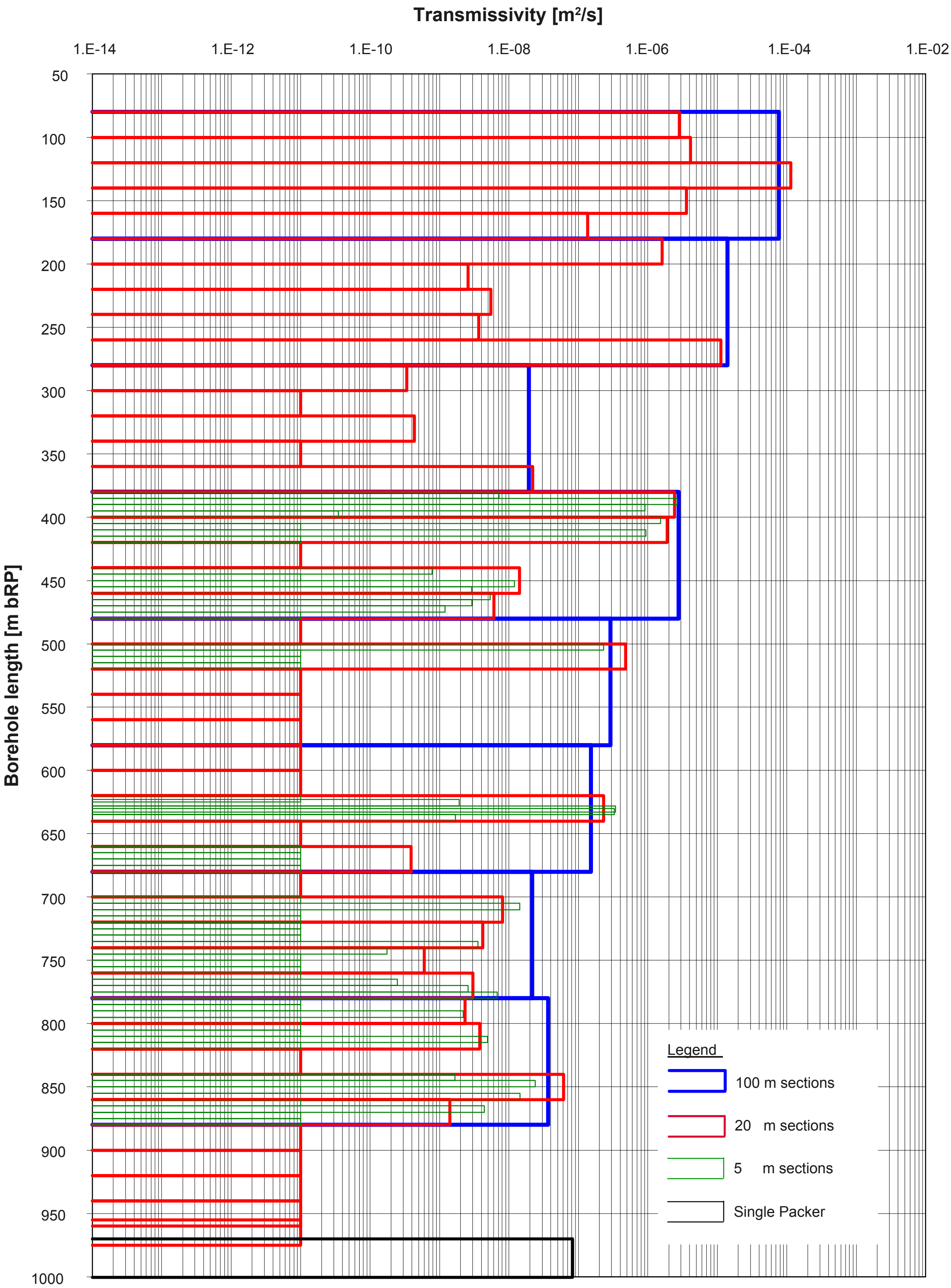


Figure 6-2. *Results summary – profile of transmissivity.*

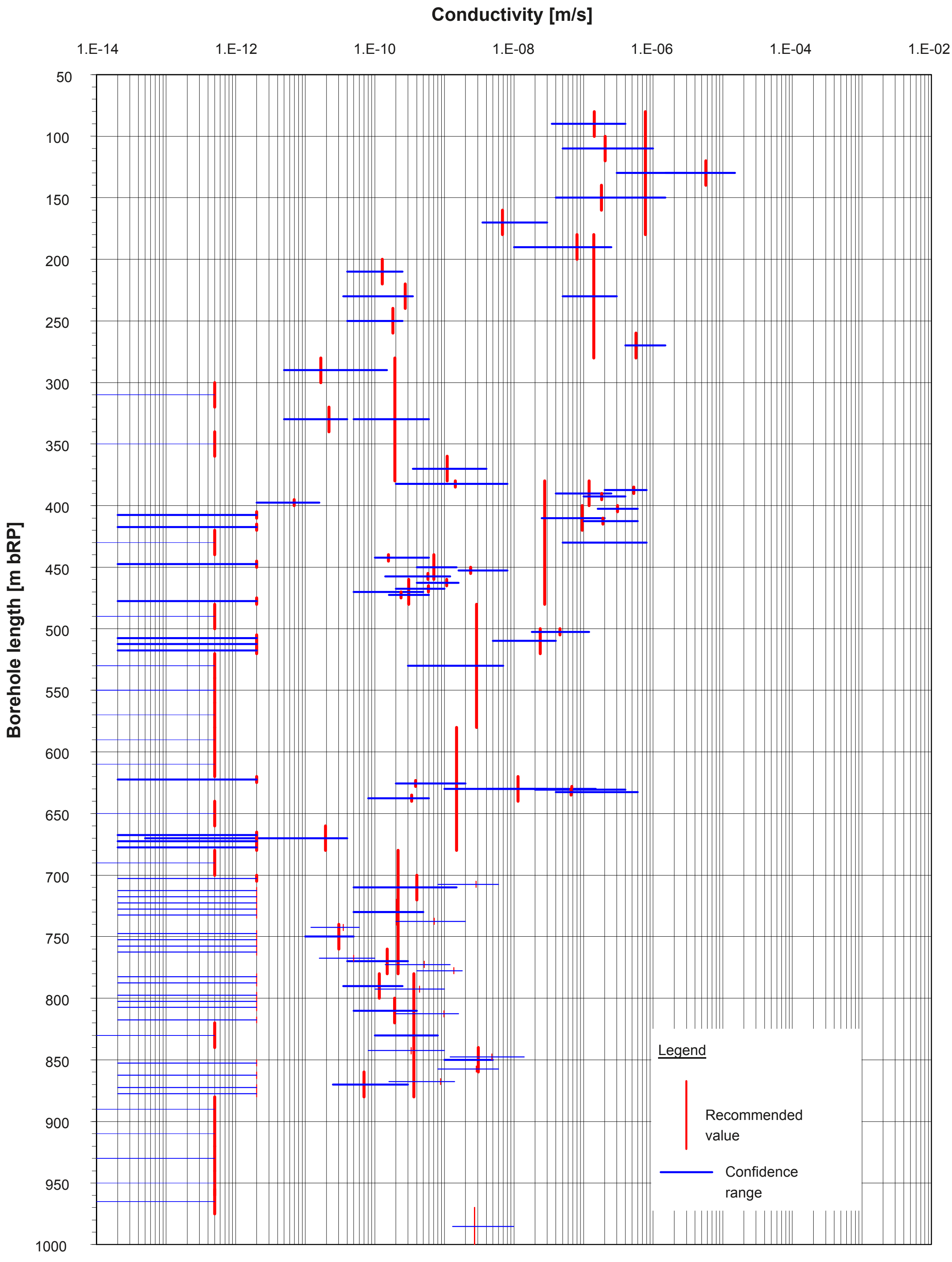


Figure 6-3. Results summary – profile of hydraulic conductivity.

6.2 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.

6.2.1 Comparison of steady state and transient analysis results

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

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

6.2.2 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 of a 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). The water compressibility depends on the temperature and salinity. However, for temperature and salinity values as encountered at the Oskarshamn site the water compressibility varies only slightly between $4.5 \cdot 10^{-10}$ and $5.0 \cdot 10^{-10}$ 1/Pa.

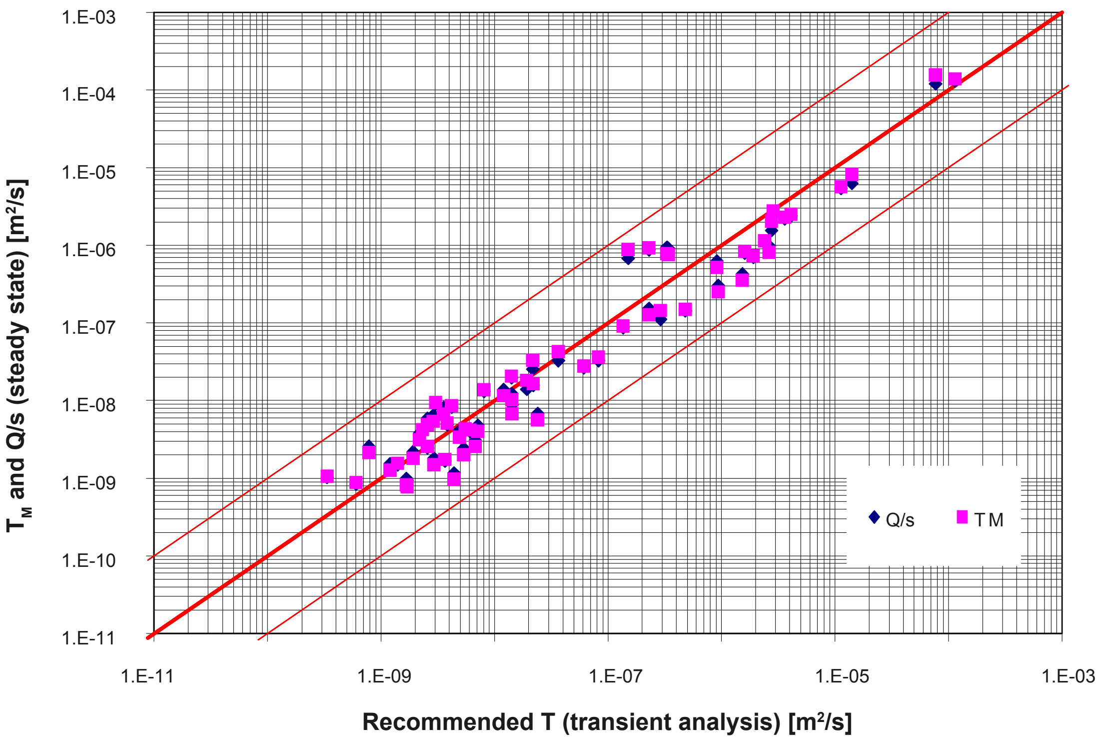


Figure 6-4. *Correlation analysis of transmissivities derived by steady state and transient methods.*

A water compressibility of $5 \cdot 10^{-10}$ 1/Pa and a rock compressibility of $1 \cdot 10^{-10}$ 1/Pa was assumed for the analysis. In addition, the test zone compressibility is influenced by the test tool (packer compliance). The test tool compressibility was calculated as follow:

$$c = \frac{\Delta V}{\Delta p} * \frac{1}{V} \text{ [1/Pa]}$$

ΔV Volume change of 2 Packers (The volume change was estimated at $7 \cdot 10^{-7}$ m^3/100 kPa based on the results of laboratory tests conducted by GEOSIGMA) [m^3].

Δp Pressure change in test section (usually $2 \cdot 10^5$ Pa) [Pa].

V Volume in test section [m^3].

The following table presents the calculated compressibilities for each relevant section length. The average value for the test tool compressibility based on different section lengths is $1 \cdot 10^{-10}$ 1/Pa.

The sum of the compressibilities (water, rock, test tool) leads to a test zone compressibility with a value of $7 \cdot 10^{-10}$ 1/Pa. This value is used for the calculation of the theoretical wellbore storage coefficient.

The matched wellbore storage coefficient is derived from the transient type curve analysis by matching the unit slope at early times derivative plotted in log-log coordinates.

The following figure presents a cross-plot of the matched and theoretical wellbore storage coefficients.

Table 6-4. Test tool compressibility values based on packer displacement.

Length of test section [m]	Volume in test section [m^3]	Compressibility [1/Pa]
5	0.023	$3 \cdot 10^{-10}$
20	0.091	$8 \cdot 10^{-11}$
100	0.454	$2 \cdot 10^{-11}$
Average compressibility:		**$1 \cdot 10^{-10}$**

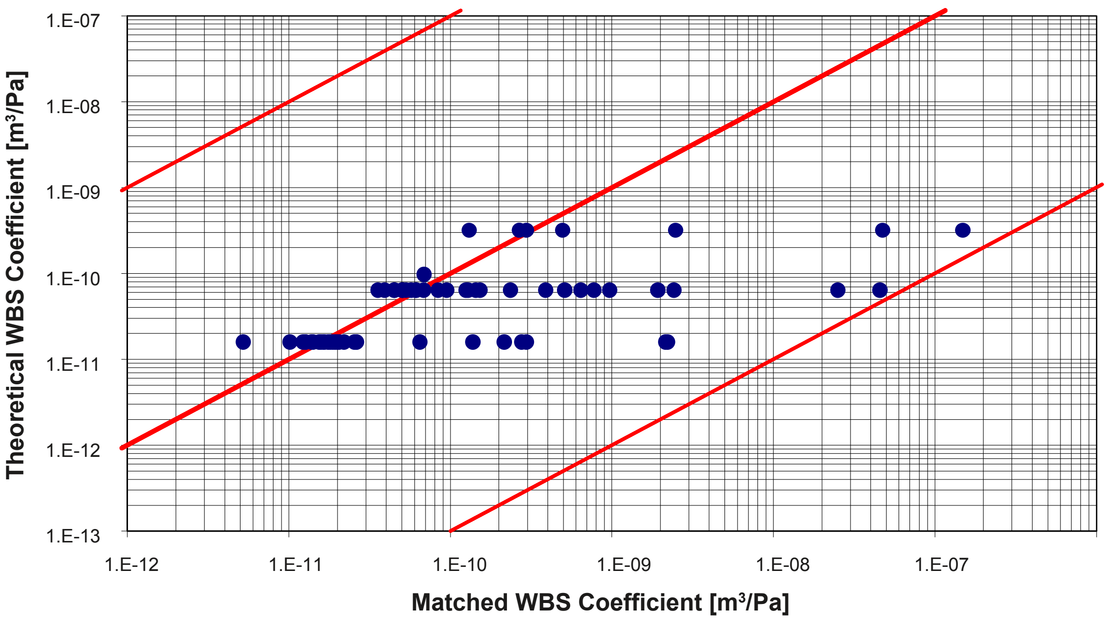


Figure 6-5. Correlation analysis of theoretical and matched wellbore storage coefficients.

It can be seen that the matched wellbore storage coefficients differ mainly up to two orders of magnitude from the theoretical value. This phenomenon was already observed at the previous boreholes. A two or three 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. This discrepancy is not fully understood, but following hypotheses may be formulated:

- increased compressibility of the packer system,
- as shown by previous work conducted at site, the phenomenon of increased wellbore storage coefficients can be explained by turbulent flow induced by the test in the vicinity of the borehole. Considering the fact that deviations concerning the wellbore storage rather occur in test sections with a higher transmissivity (which can lead to turbulent flow) seems to rest upon this hypothesis.

7 Conclusions

7.1 Transmissivity

Figure 6-1 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 4.5.9.

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.

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. In four cases the preliminary pulse was prolonged and the recommended transmissivity range from $3.5 \cdot 10^{-11}$ m²/s to $4.4 \cdot 10^{-10}$ m²/s.

The recommended transmissivities derived from the conducted injection tests (CHi and CHir) range between $3.4 \cdot 10^{-10}$ m²/s and $1.1 \cdot 10^{-4}$ m²/s.

A few of the 20 m sections show a slightly higher transmissivity than the appropriate 100 m section. In these cased, a crossflow or hydraulic connection to adjacent zones cannot be excluded by performing the relevant 20 m section tests. At some of the relevant 20 m section tests an increase of pressure at Pb was observed during injection which is consistent with the crossflow hypothesis. The same was observed at a few of the 5 m sections comparing to the appropriate 20 m sections. These effects were always observed at zones where a fracture network observed at the relevant televiewing sections may lead not only to a relative high formation transmissivity but also to the crossflow effects.

7.2 Equivalent freshwater head

Figure 6-1 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 4.5.8.

The head profile shows the freshwater head ranges from 6.0 m to 17.1 m. The highest freshwater heads were measured between 790 m and 1,000 m, whereas the lowest freshwater heads were measured between 180 m and 260 m.

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. In several cases no freshwater head was calculated due to the high uncertainty of the formation pressure.

7.3 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 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 transmissivities as low as $4 \cdot 10^{-9}$ m^2/s (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 (flow dimension 1), a slope of 0 (horizontal derivative, flow dimension 2) indicates radial flow and a slope of –0.5 indicates spherical flow (flow dimension 3). The flow dimension diagnosis was commented for each of the tests. In all of the cases it was possible to get a good match quality by using radial flow geometry. In no cases an alternative analysis with a flow dimension unequal to two was performed.

8 References

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APPENDIX 1

File Description Table

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12.4.2007	17:54	280.00	380.00	__KLX15A_0280.00_200704121754.ht2	KLX15A_280.00-380.00_070412_1_CHir_Q_r.csv	CHir	29.4.2007	12.4.2007	
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15.4.2007	22:53	260.00	280.00	__KLX15A_0260.00_200704152253.ht2	KLX15A_260.00-280.00_070415_1_CHir_Q_r.csv	CHir	29.4.2007	16.4.2007	
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17.4.2007	08:22	500.00	520.00	__KLX15A_0500.00_200704170822.ht2	KLX15A_500.00-520.00_070417_1_CHir_Q_r.csv	CHir	29.4.2007	17.4.2007	
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17.4.2007	19:54	620.00	640.00	__KLX15A_0620.00_200704171954.ht2	KLX15A_620.00-640.00_070417_1_CHir_Q_r.csv	CHir	29.4.2007	17.4.2007	
17.4.2007	22:57	640.00	660.00	__KLX15A_0640.00_200704172257.ht2	KLX15A_640.00-660.00_070417_1_Pi_Q_r.csv	Pi	29.4.2007	18.4.2007	
18.4.2007	00:38	660.00	680.00	__KLX15A_0660.00_200704180038.ht2	KLX15A_660.00-680.00_070418_1_Pi_Q_r.csv	Pi	29.4.2007	18.4.2007	
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Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
19.4.2007	07:59	840.00	860.00	__KLX15A_0840.00_200704190759.ht2	KLX15A_840.00-860.00_070419_1_CHir_Q_r.csv	CHir	29.4.2007	19.4.2007	
19.4.2007	10:19	860.00	880.00	__KLX15A_0860.00_200704191019.ht2	KLX15A_860.00-880.00_070419_1_CHir_Q_r.csv	CHir	29.4.2007	19.4.2007	
19.4.2007	14:46	880.00	900.00	__KLX15A_0880.00_200704191446.ht2	KLX15A_880.00-900.00_070419_1_CHir_Q_r.csv	CHir	29.4.2007	19.4.2007	
19.4.2007	16:30	900.00	920.00	__KLX15A_0900.00_200704191630.ht2	KLX15A_900.00-920.00_070419_1_CHir_Q_r.csv	CHir	29.4.2007	19.4.2007	
19.4.2007	17:52	920.00	940.00	__KLX15A_0920.00_200704191752.ht2	KLX15A_920.00-940.00_070419_1_CHir_Q_r.csv	CHir	29.4.2007	19.4.2007	
19.4.2007	20:42	940.00	960.00	__KLX15A_0940.00_200704192042.ht2	KLX15A_940.00-960.00_070419_1_CHir_Q_r.csv	CHir	29.4.2007	19.4.2007	
19.4.2007	22:03	955.00	975.00	__KLX15A_0955.00_200704192203.ht2	KLX15A_955.00-975.00_070419_1_CHir_Q_r.csv	CHir	29.4.2007	19.4.2007	
21.4.2007	12:18	380.00	385.00	__KLX15A_0380.00_200704211218.ht2	KLX15A_380.00-385.00_070421_1_CHir_Q_r.csv	CHir	29.4.2007	21.4.2007	
21.4.2007	15:06	385.00	390.00	__KLX15A_0385.00_200704211506.ht2	KLX15A_385.00-390.00_070421_1_CHir_Q_r.csv	CHir	29.4.2007	21.4.2007	
21.4.2007	16:56	390.00	395.00	__KLX15A_0390.00_200704211656.ht2	KLX15A_390.00-395.00_070421_1_CHir_Q_r.csv	CHir	29.4.2007	21.4.2007	
21.4.2007	18:45	395.00	400.00	__KLX15A_0395.00_200704211845.ht2	KLX15A_395.00-400.00_070421_1_Pi_Q_r.csv	Pi	29.4.2007	21.4.2007	
21.4.2007	21:07	400.00	405.00	__KLX15A_0400.00_200704212107.ht2	KLX15A_400.00-405.00_070421_1_CHir_Q_r.csv	CHir	29.4.2007	21.4.2007	
21.4.2007	22:58	405.00	410.00	__KLX15A_0405.00_200704212258.ht2	KLX15A_405.00-410.00_070421_1_CHir_Q_r.csv	CHir	29.4.2007	21.4.2007	
22.4.2007	00:11	410.00	415.00	__KLX15A_0410.00_200704220011.ht2	KLX15A_410.00-415.00_070422_1_CHir_Q_r.csv	CHir	29.4.2007	22.4.2007	
22.4.2007	06:38	415.00	420.00	__KLX15A_0415.00_200704220638.ht2	KLX15A_415.00-420.00_070422_1_CHir_Q_r.csv	CHir	29.4.2007	22.4.2007	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KLX15A				
TEST- AND FILEPROTOCOL					**Testorder dated : 2007-04-11**				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
22.4.2007	08:18	440.00	445.00	__KLX15A_0440.00_200704220818.ht2	KLX15A_440.00-445.00_070422_1_CHir_Q_r.csv	CHir	29.4.2007	22.4.2007	
22.4.2007	10:48	445.00	450.00	__KLX15A_0445.00_200704221048.ht2	KLX15A_445.00-450.00_070422_1_CHir_Q_r.csv	CHir	29.4.2007	22.4.2007	
22.4.2007	13:05	450.00	455.00	__KLX15A_0450.00_200704221305.ht2	KLX15A_450.00-455.00_070422_1_CHir_Q_r.csv	CHir	29.4.2007	22.4.2007	
22.4.2007	15:03	455.00	460.00	__KLX15A_0455.00_200704221503.ht2	KLX15A_455.00-460.00_070422_1_CHir_Q_r.csv	CHir	29.4.2007	22.4.2007	
22.4.2007	17:10	460.00	465.00	__KLX15A_0460.00_200704221710.ht2	KLX15A_460.00-465.00_070422_1_CHir_Q_r.csv	CHir	29.4.2007	22.4.2007	
22.4.2007	19:02	465.00	470.00	__KLX15A_0465.00_200704221902.ht2	KLX15A_465.00-470.00_070422_1_CHir_Q_r.csv	CHir	29.4.2007	22.4.2007	
22.4.2007	21:41	470.00	475.00	__KLX15A_0470.00_200704222141.ht2	KLX15A_470.00-475.00_070422_1_CHir_Q_r.csv	CHir	29.4.2007	22.4.2007	
22.4.2007	23:36	475.00	480.00	__KLX15A_0475.00_200704222336.ht2	KLX15A_475.00-480.00_070422_1_CHir_Q_r.csv	CHir	29.4.2007	23.4.2007	
23.4.2007	00:58	500.00	505.00	__KLX15A_0500.00_200704230058.ht2	KLX15A_500.00-505.00_070423_1_CHir_Q_r.csv	CHir	29.4.2007	23.4.2007	
23.4.2007	06:34	505.00	510.00	__KLX15A_0505.00_200704230634.ht2	KLX15A_505.00-510.00_070423_1_CHir_Q_r.csv	CHir	29.4.2007	23.4.2007	
23.4.2007	07:57	510.00	515.00	__KLX15A_0510.00_200704230757.ht2	KLX15A_510.00-515.00_070423_1_CHir_Q_r.csv	CHir	29.4.2007	23.4.2007	
23.4.2007	09:17	515.00	520.00	__KLX15A_0515.00_200704230917.ht2	KLX15A_515.00-520.00_070423_1_CHir_Q_r.csv	CHir	29.4.2007	23.4.2007	
23.4.2007	13:19	620.00	625.00	__KLX15A_0620.00_200704231319.ht2	KLX15A_620.00-625.00_070423_1_CHir_Q_r.csv	CHir	29.4.2007	23.4.2007	
23.4.2007	14:31	623.00	628.00	__KLX15A_0623.00_200704231431.ht2	KLX15A_623.00-628.00_070423_1_CHir_Q_r.csv	CHir	29.4.2007	23.4.2007	
23.4.2007	16:25	628.00	633.00	__KLX15A_0628.00_200704231625.ht2	KLX15A_628.00-633.00_070423_1_CHir_Q_r.csv	CHir	29.4.2007	23.4.2007	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KLX15A				
TEST- AND FILEPROTOCOL					Testorder dated : 2007-04-11				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
23.4.2007	18:21	630.00	635.00	__KLX15A_0630.00_200704231821.ht2	KLX15A_630.00-635.00_070423_1_CHir_Q_r.csv	CHir	29.4.2007	23.4.2007	
23.4.2007	20:25	635.00	640.00	__KLX15A_0635.00_200704232025.ht2	KLX15A_635.00-640.00_070423_1_CHir_Q_r.csv	CHir	29.4.2007	23.4.2007	
23.4.2007	22:41	660.00	665.00	__KLX15A_0660.00_200704232241.ht2	KLX15A_660.00-665.00_070423_1_CHir_Q_r.csv	CHir	29.4.2007	23.4.2007	
23.4.2007	23:55	665.00	670.00	__KLX15A_0665.00_200704232355.ht2	KLX15A_665.00-670.00_070423_1_CHir_Q_r.csv	CHir	29.4.2007	24.4.2007	
24.4.2007	01:07	670.00	675.00	__KLX15A_0670.00_200704240107.ht2	KLX15A_670.00-675.00_070424_1_CHir_Q_r.csv	CHir	29.4.2007	24.4.2007	
24.4.2007	06:35	675.00	680.00	__KLX15A_0675.00_200704240635.ht2	KLX15A_675.00-680.00_070424_1_CHir_Q_r.csv	CHir	29.4.2007	24.4.2007	
24.4.2007	08:09	700.00	705.00	__KLX15A_0700.00_200704240809.ht2	KLX15A_700.00-705.00_070424_1_CHir_Q_r.csv	CHir	29.4.2007	24.4.2007	
24.4.2007	09:27	705.00	710.00	__KLX15A_0705.00_200704240927.ht2	KLX15A_705.00-710.00_070424_1_CHir_Q_r.csv	CHir	29.4.2007	24.4.2007	
24.4.2007	12:23	710.00	715.00	__KLX15A_0710.00_200704241223.ht2	KLX15A_710.00-715.00_070424_1_CHir_Q_r.csv	CHir	29.4.2007	24.4.2007	
24.4.2007	13:42	715.00	720.00	__KLX15A_0715.00_200704241342.ht2	KLX15A_715.00-720.00_070424_1_CHir_Q_r.csv	CHir	29.4.2007	24.4.2007	
24.4.2007	15:00	720.00	725.00	__KLX15A_0720.00_200704241500.ht2	KLX15A_720.00-725.00_070424_1_CHir_Q_r.csv	CHir	29.4.2007	24.4.2007	
24.4.2007	16:16	725.00	730.00	__KLX15A_0725.00_200704241616.ht2	KLX15A_725.00-730.00_070424_1_CHir_Q_r.csv	CHir	29.4.2007	24.4.2007	
24.4.2007	17:29	730.00	735.00	__KLX15A_0730.00_200704241729.ht2	KLX15A_730.00-735.00_070424_1_CHir_Q_r.csv	CHir	29.4.2007	24.4.2007	
24.4.2007	18:46	735.00	740.00	__KLX15A_0735.00_200704241846.ht2	KLX15A_735.00-740.00_070424_1_CHir_Q_r.csv	CHir	29.4.2007	24.4.2007	
24.4.2007	21:17	740.00	745.00	__KLX15A_0740.00_200704242117.ht2	KLX15A_740.00-745.00_070424_1_Pi_Q_r.csv	Pi	29.4.2007	24.4.2007	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KLX15A				
TEST- AND FILEPROTOCOL					Testorder dated : 2007-04-11				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
24.4.2007	23:35	745.00	750.00	__KLX15A_0745.00_200704242335.ht2	KLX15A_745.00-750.00_070424_1_CHir_Q_r.csv	CHir	29.4.2007	25.4.2007	
25.4.2007	00:48	750.00	755.00	__KLX15A_0750.00_200704250048.ht2	KLX15A_750.00-755.00_070425_1_CHir_Q_r.csv	CHir	29.4.2007	25.4.2007	
25.4.2007	06:31	755.00	760.00	__KLX15A_0755.00_200704250631.ht2	KLX15A_755.00-760.00_070425_1_CHir_Q_r.csv	CHir	29.4.2007	25.4.2007	
25.4.2007	07:45	760.00	765.00	__KLX15A_0760.00_200704250745.ht2	KLX15A_760.00-765.00_070425_1_CHir_Q_r.csv	CHir	29.4.2007	25.4.2007	
25.4.2007	09:00	765.00	770.00	__KLX15A_0765.00_200704250900.ht2	KLX15A_765.00-770.00_070425_1_Pi_Q_r.csv	Pi	29.4.2007	25.4.2007	
25.4.2007	13:20	770.00	775.00	__KLX15A_0770.00_200704251320.ht2	KLX15A_770.00-775.00_070425_1_CHir_Q_r.csv	CHir	29.4.2007	25.4.2007	
25.4.2007	17:38	775.00	780.00	__KLX15A_0775.00_200704251738.ht2	KLX15A_775.00-780.00_070425_1_CHir_Q_r.csv	CHir	29.4.2007	25.4.2007	
25.4.2007	19:31	780.00	785.00	__KLX15A_0780.00_200704251931.ht2	KLX15A_780.00-785.00_070425_1_Pi_Q_r.csv	Pi	29.4.2007	25.4.2007	
25.4.2007	21:31	785.00	790.00	__KLX15A_0785.00_200704252131.ht2	KLX15A_785.00-790.00_070425_1_CHir_Q_r.csv	CHir	29.4.2007	25.4.2007	
25.4.2007	22:42	790.00	795.00	__KLX15A_0790.00_200704252242.ht2	KLX15A_790.00-795.00_070425_1_CHir_Q_r.csv	CHir	29.4.2007	25.4.2007	
26.4.2007	00:40	795.00	800.00	__KLX15A_0795.00_200704260040.ht2	KLX15A_795.00-800.00_070426_1_CHir_Q_r.csv	CHir	29.4.2007	26.4.2007	
26.4.2007	06:31	800.00	805.00	__KLX15A_0800.00_200704260631.ht2	KLX15A_800.00-805.00_070426_1_CHir_Q_r.csv	CHir	29.4.2007	26.4.2007	
26.4.2007	12:24	805.00	810.00	__KLX15A_0805.00_200704261224.ht2	KLX15A_805.00-810.00_070426_1_CHir_Q_r.csv	CHir	29.4.2007	26.4.2007	
26.4.2007	13:40	810.00	815.00	__KLX15A_0810.00_200704261340.ht2	KLX15A_810.00-815.00_070426_1_CHir_Q_r.csv	CHir	29.4.2007	26.4.2007	
26.4.2007	15:35	815.00	820.00	__KLX15A_0815.00_200704261535.ht2	KLX15A_815.00-820.00_070426_1_CHir_Q_r.csv	CHir	29.4.2007	26.4.2007	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KLX15A				
TEST- AND FILEPROTOCOL					Testorder dated : 2007-04-11				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
26.4.2007	17:00	840.00	845.00	__KLX15A_0840.00_200704261700.ht2	KLX15A_840.00-845.00_070426_1_CHir_Q_r.csv	CHir	29.4.2007	26.4.2007	
26.4.2007	19:05	845.00	850.00	__KLX15A_0845.00_200704261905.ht2	KLX15A_845.00-850.00_070426_1_CHir_Q_r.csv	CHir	29.4.2007	26.4.2007	
26.4.2007	21:12	850.00	855.00	__KLX15A_0850.00_200704262112.ht2	KLX15A_850.00-855.00_070426_1_CHir_Q_r.csv	CHir	29.4.2007	26.4.2007	
26.4.2007	22:24	855.00	860.00	__KLX15A_0855.00_200704262224.ht2	KLX15A_855.00-860.00_070426_1_CHir_Q_r.csv	CHir	29.4.2007	26.4.2007	
27.4.2007	00:09	860.00	865.00	__KLX15A_0860.00_200704270009.ht2	KLX15A_860.00-865.00_070427_1_CHir_Q_r.csv	CHir	29.4.2007	27.4.2007	
27.4.2007	01:20	865.00	870.00	__KLX15A_0865.00_200704270120.ht2	KLX15A_865.00-870.00_070427_1_CHir_Q_r.csv	CHir	29.4.2007	27.4.2007	
27.4.2007	06:28	870.00	875.00	__KLX15A_0870.00_200704270628.ht2	KLX15A_870.00-875.00_070427_1_CHir_Q_r.csv	CHir	29.4.2007	27.4.2007	
27.4.2007	07:43	875.00	880.00	__KLX15A_0875.00_200704270743.ht2	KLX15A_875.00-880.00_070427_1_CHir_Q_r.csv	CHir	29.4.2007	27.4.2007	
28.4.2007	10:58	970.00	1000.43	__KLX15A_0970.00_200704281058.ht2	KLX15A_970.00-1000.43_070428_1_CHir_Q_r.csv	CHir	29.4.2007	28.4.2007	

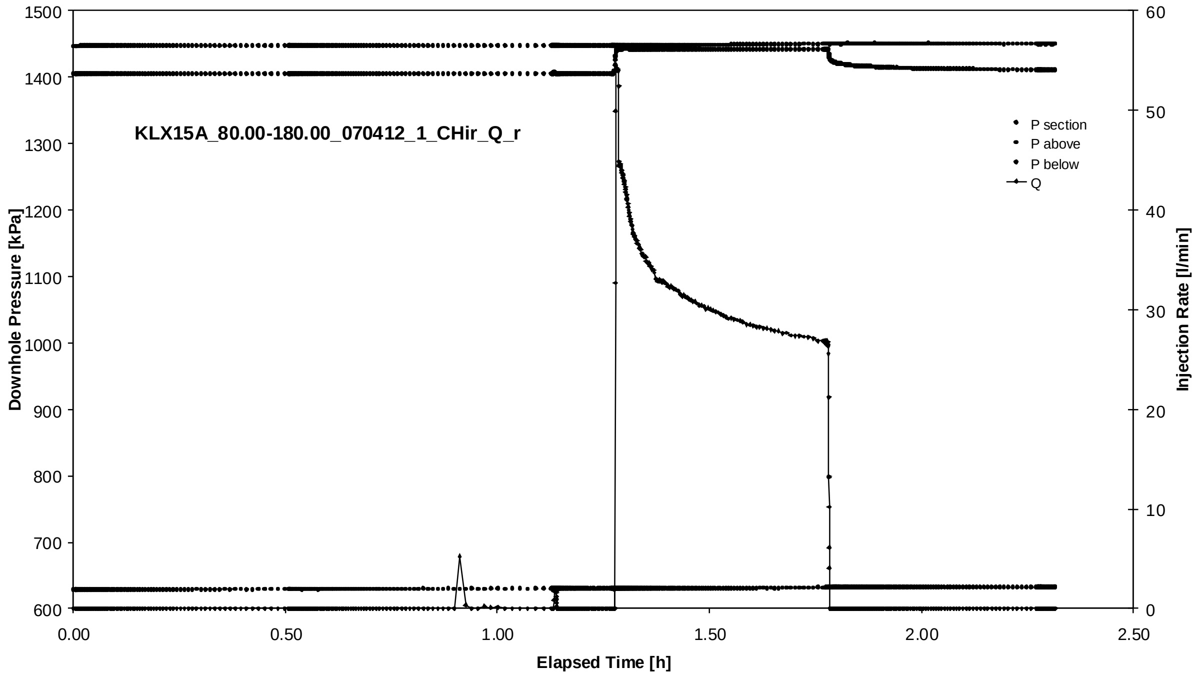
APPENDIX 2

Analysis diagrams

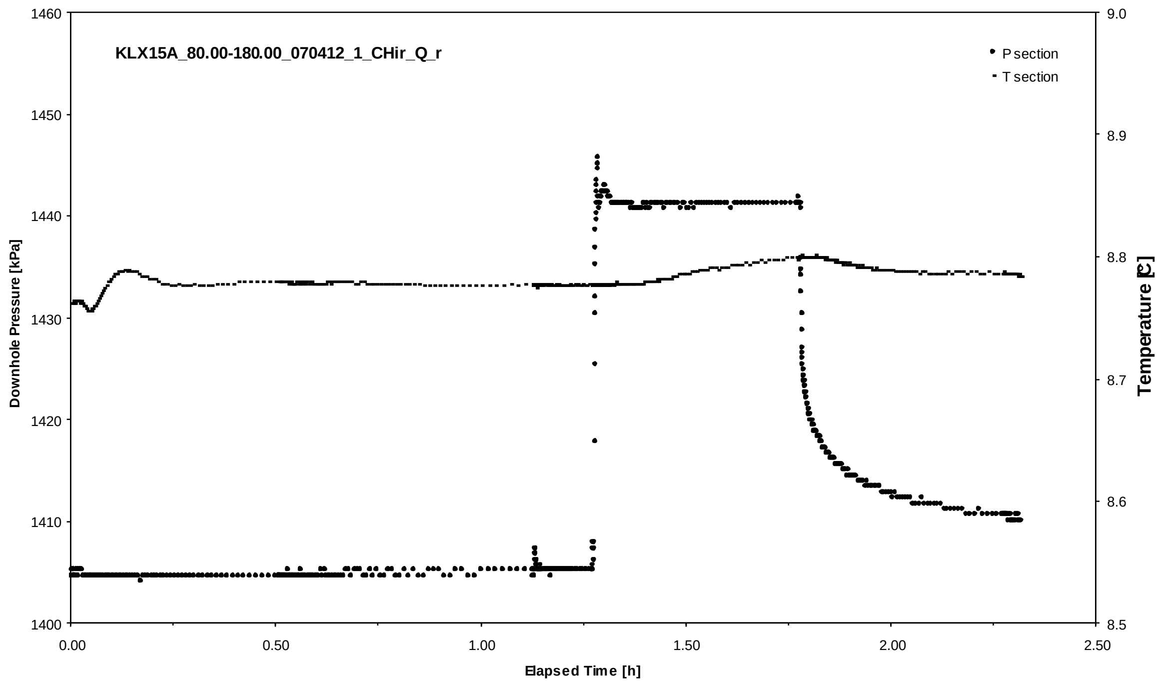
APPENDIX 2-1

Test 80.00 – 180.00 m

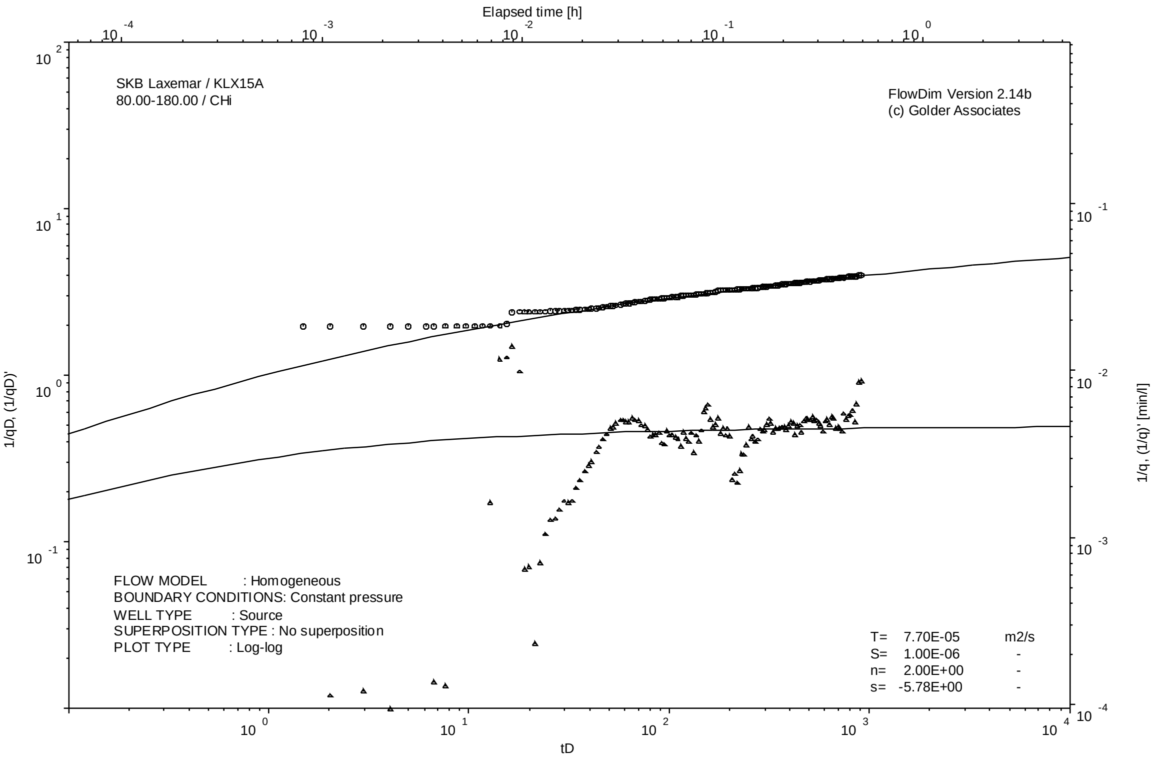
Analysis diagrams



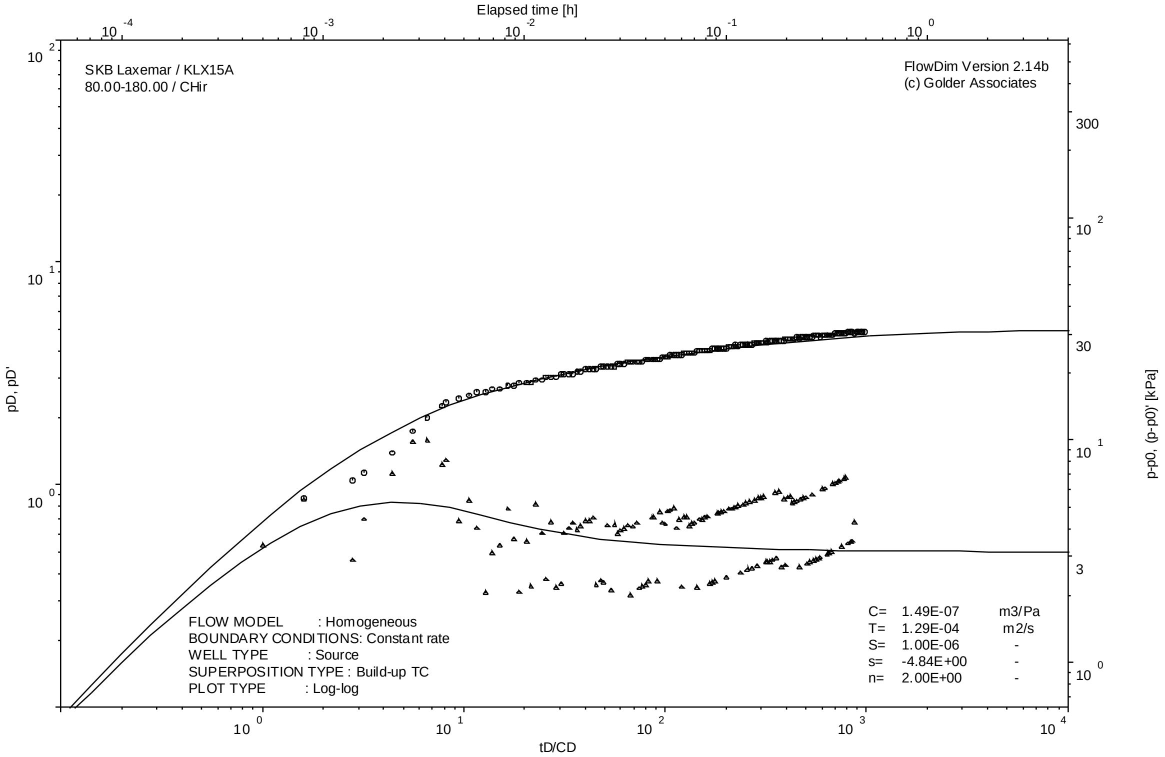
Pressure and flow rate vs. time; cartesian plot



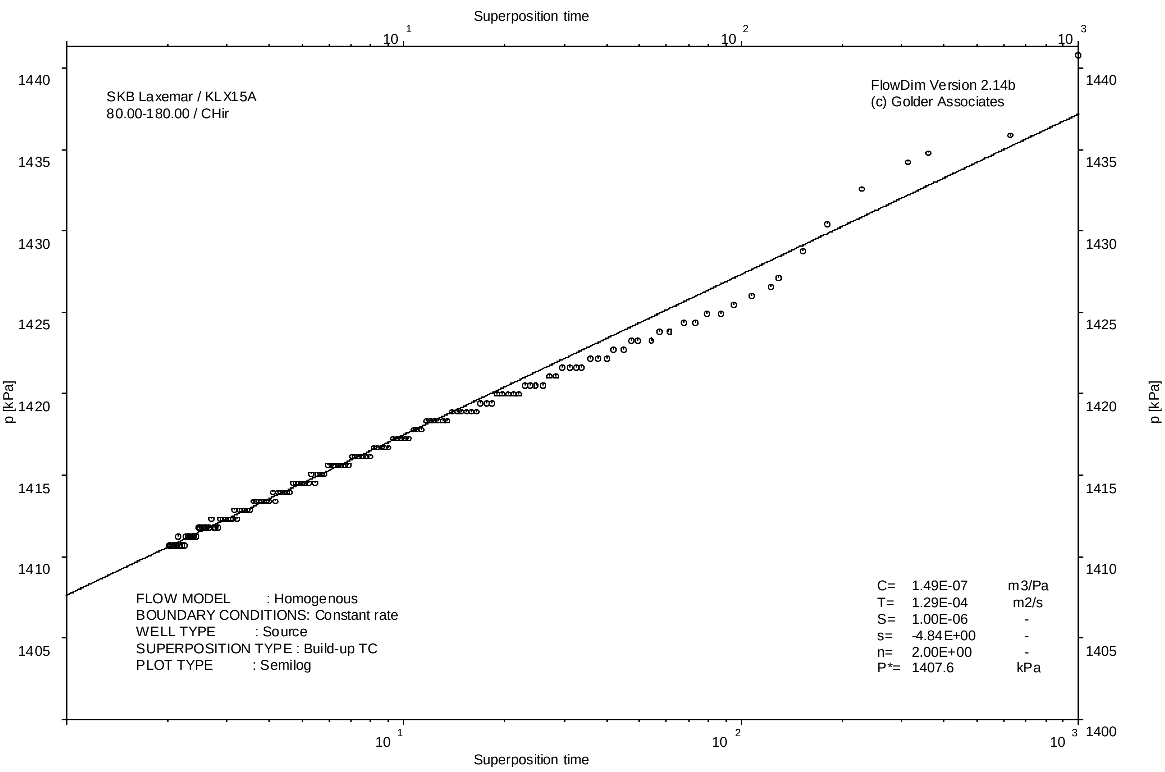
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

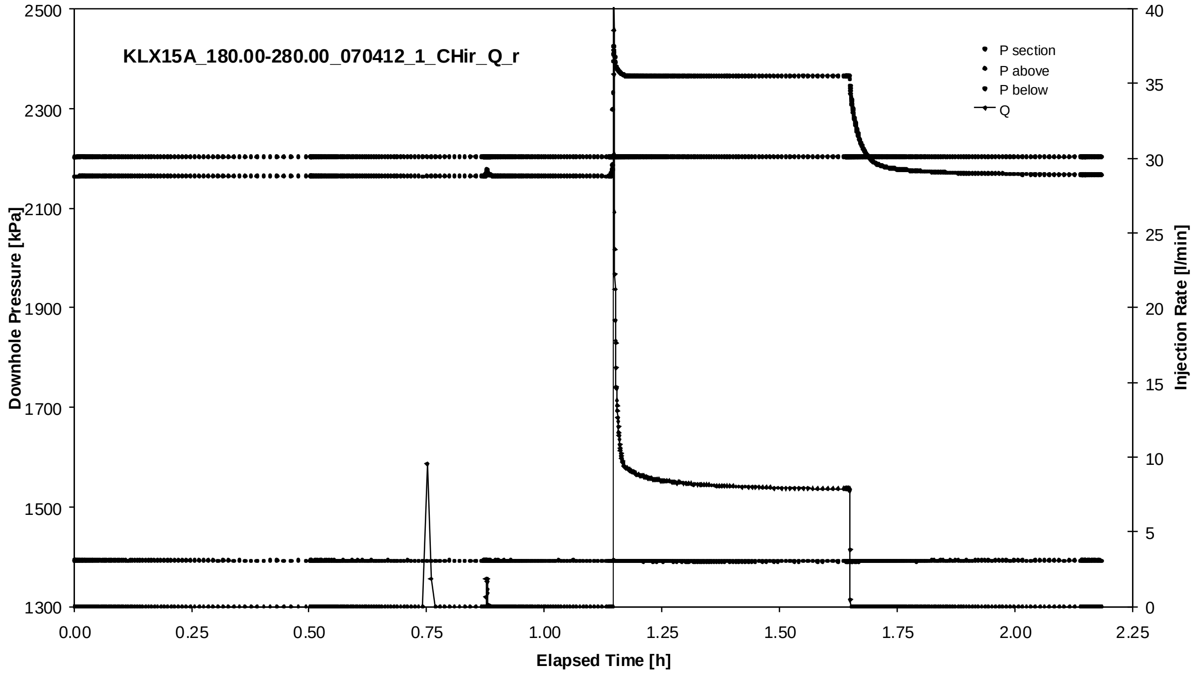


CHIR phase; HORNER match

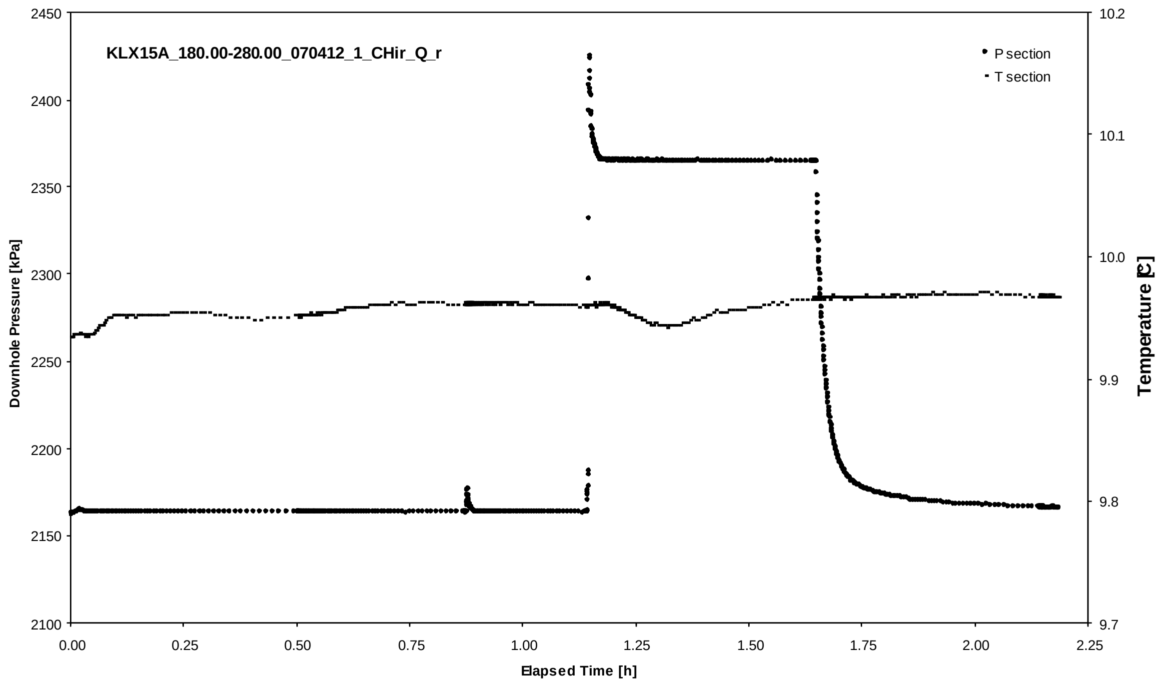
APPENDIX 2-2

Test 180.00 – 280.00 m

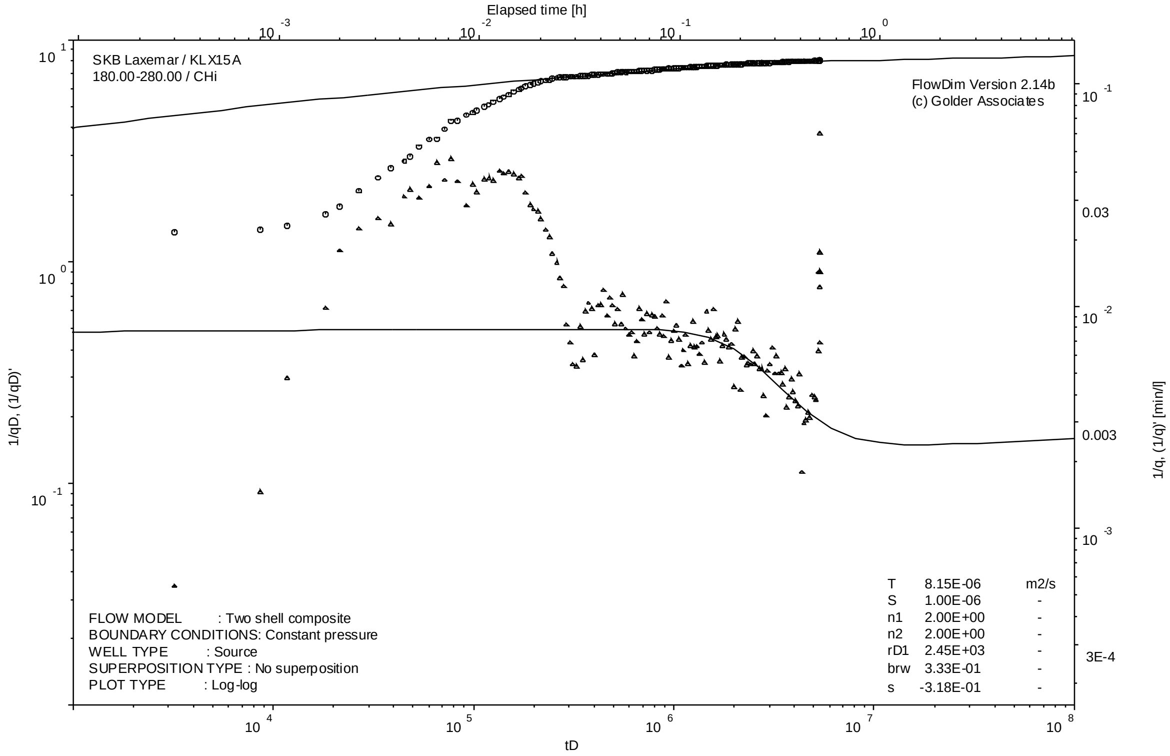
Analysis diagrams



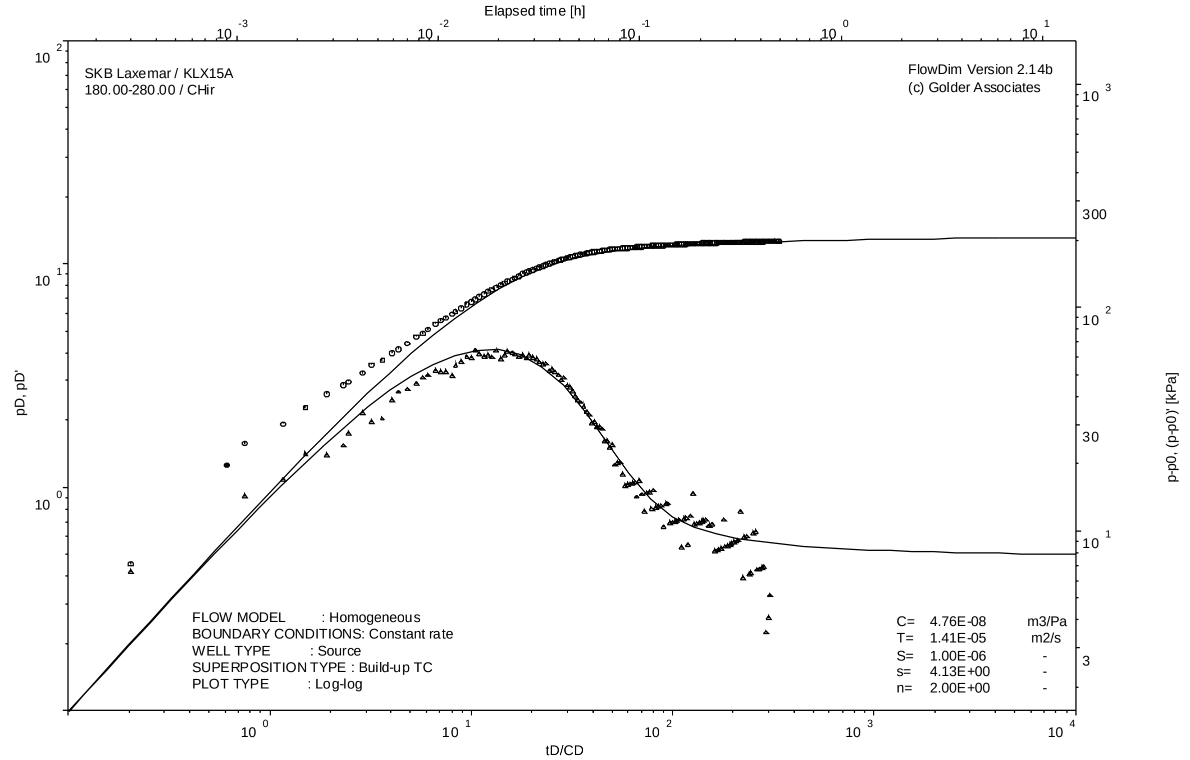
Pressure and flow rate vs. time; cartesian plot



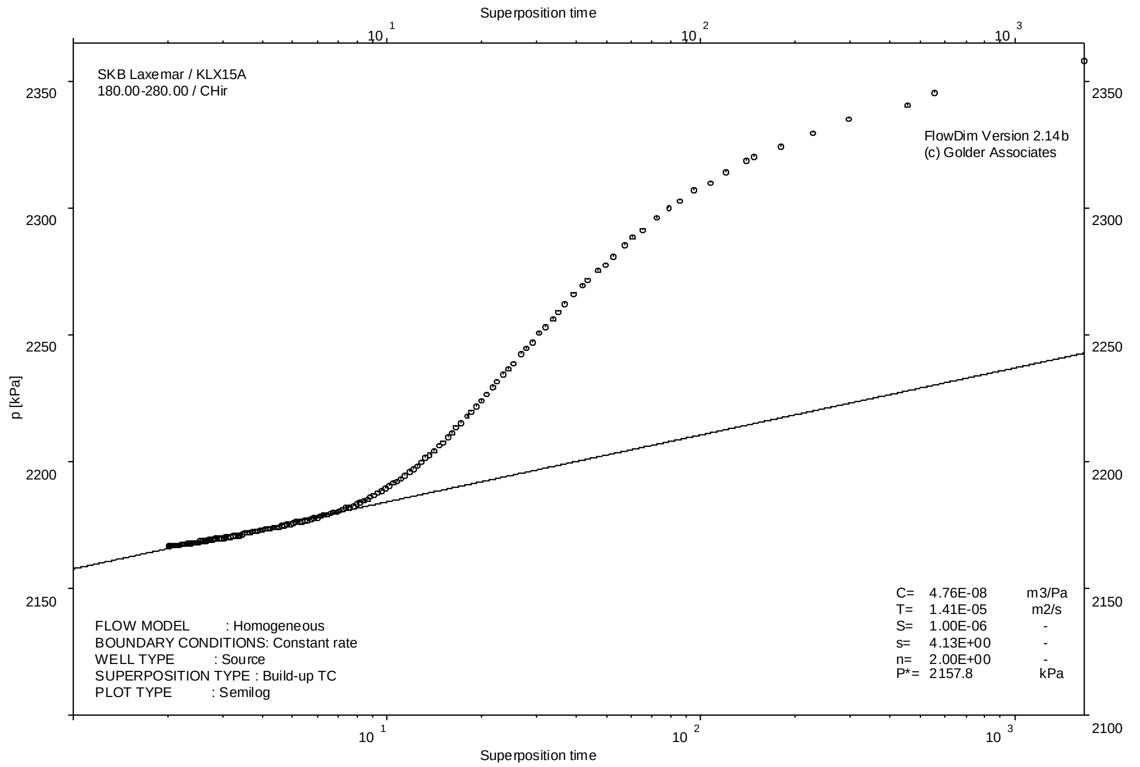
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

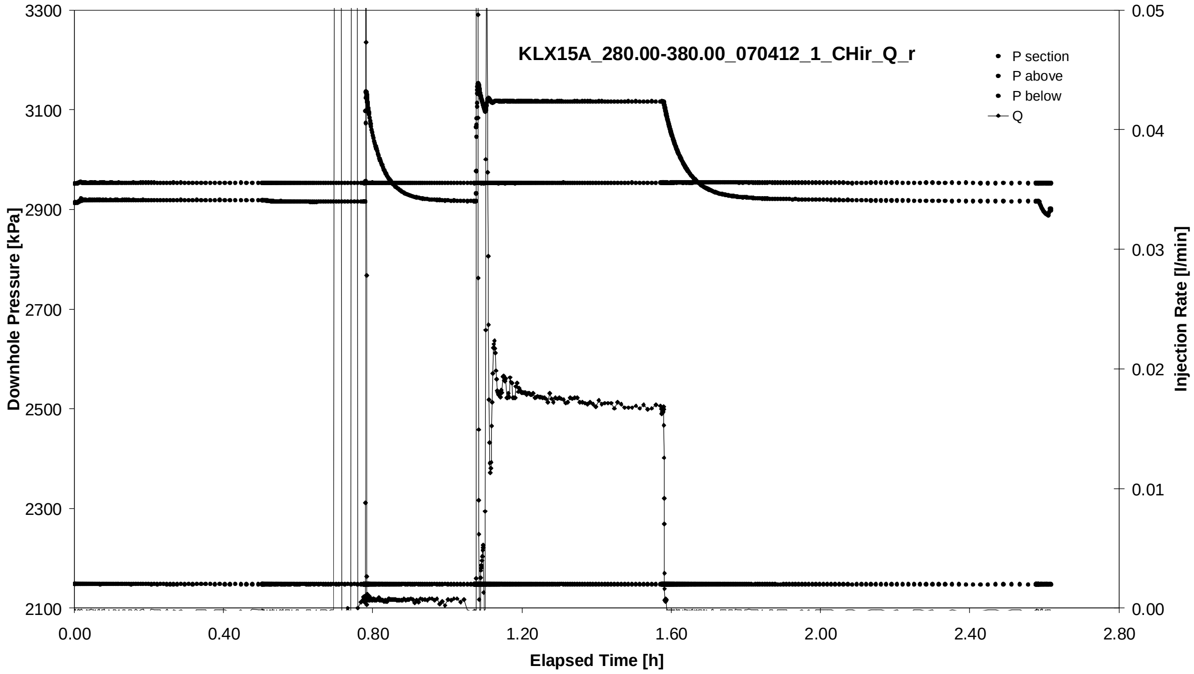


CHIR phase; HORNER match

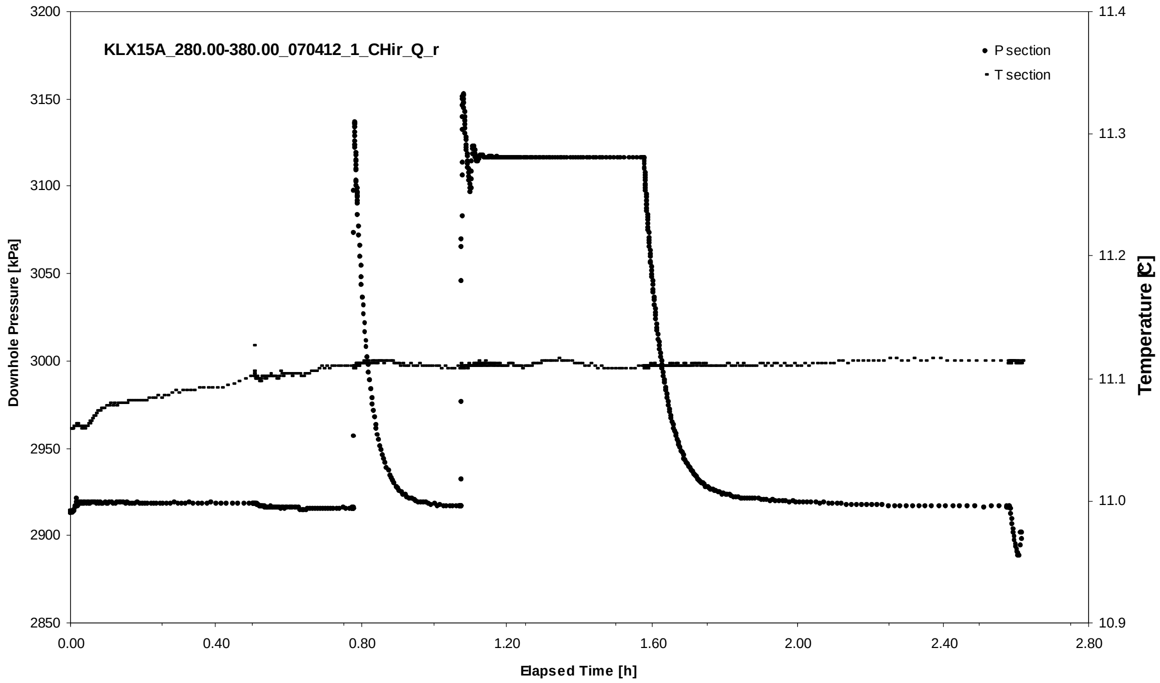
APPENDIX 2-3

Test 280.00 – 380.00 m

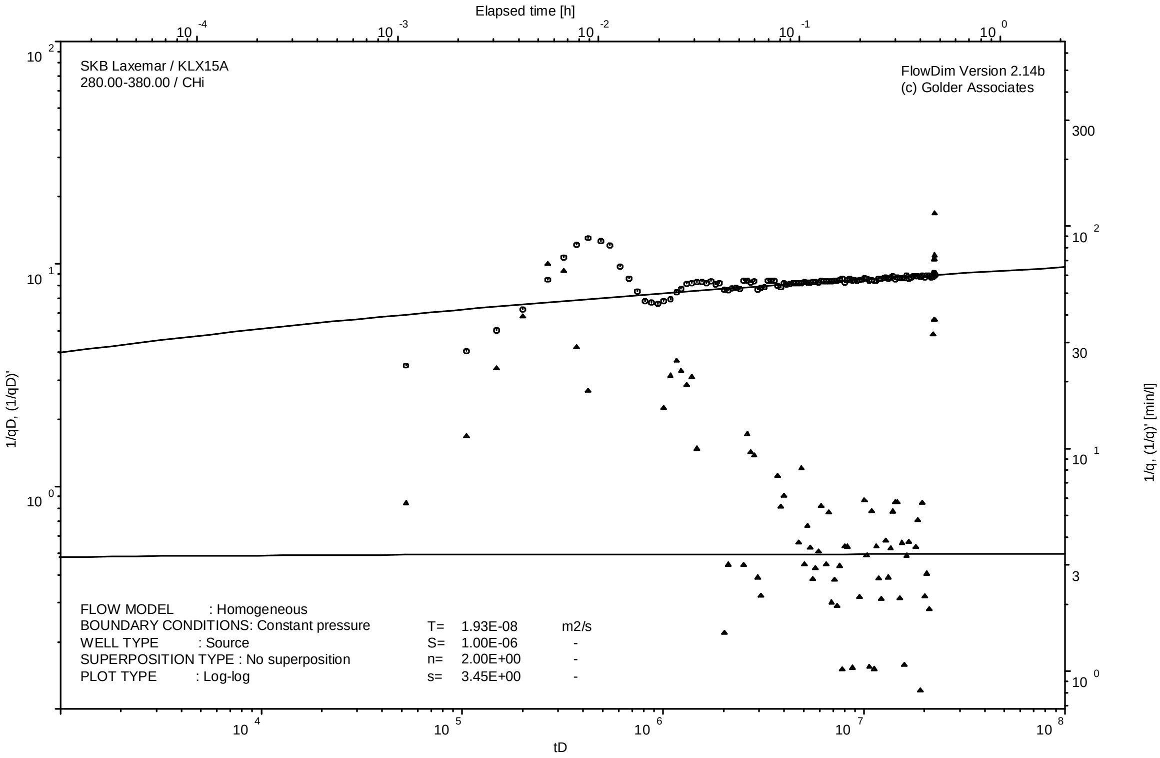
Analysis diagrams



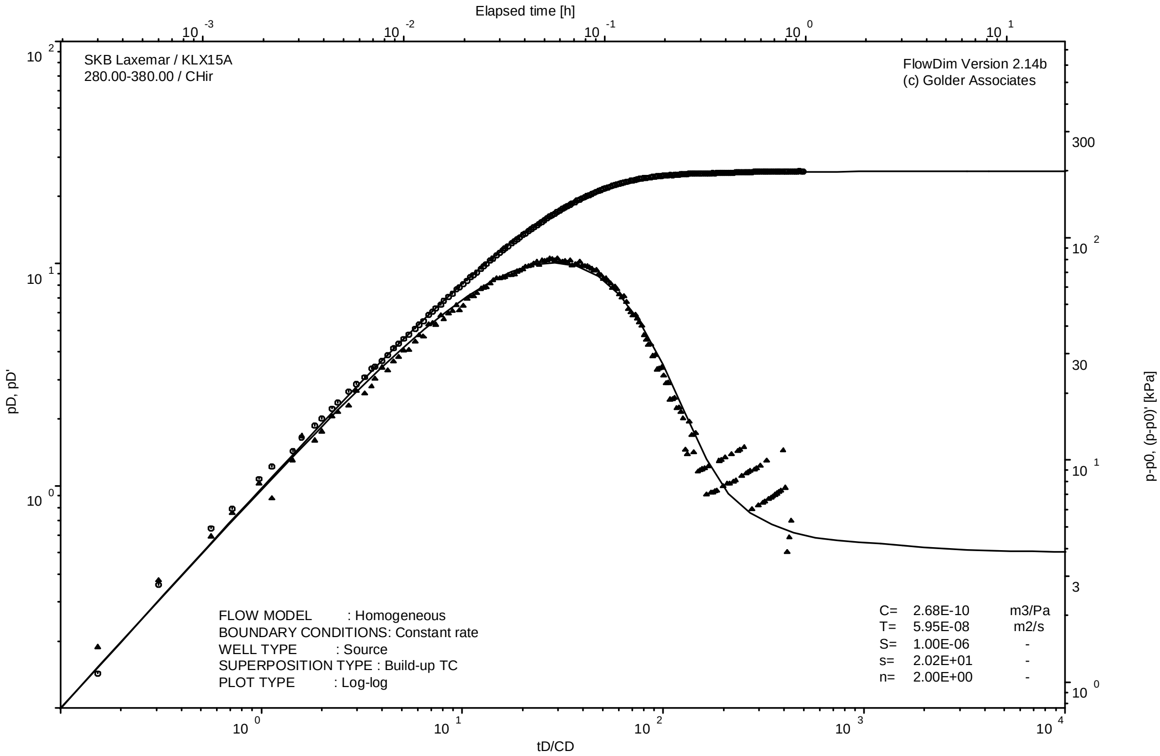
Pressure and flow rate vs. time; cartesian plot



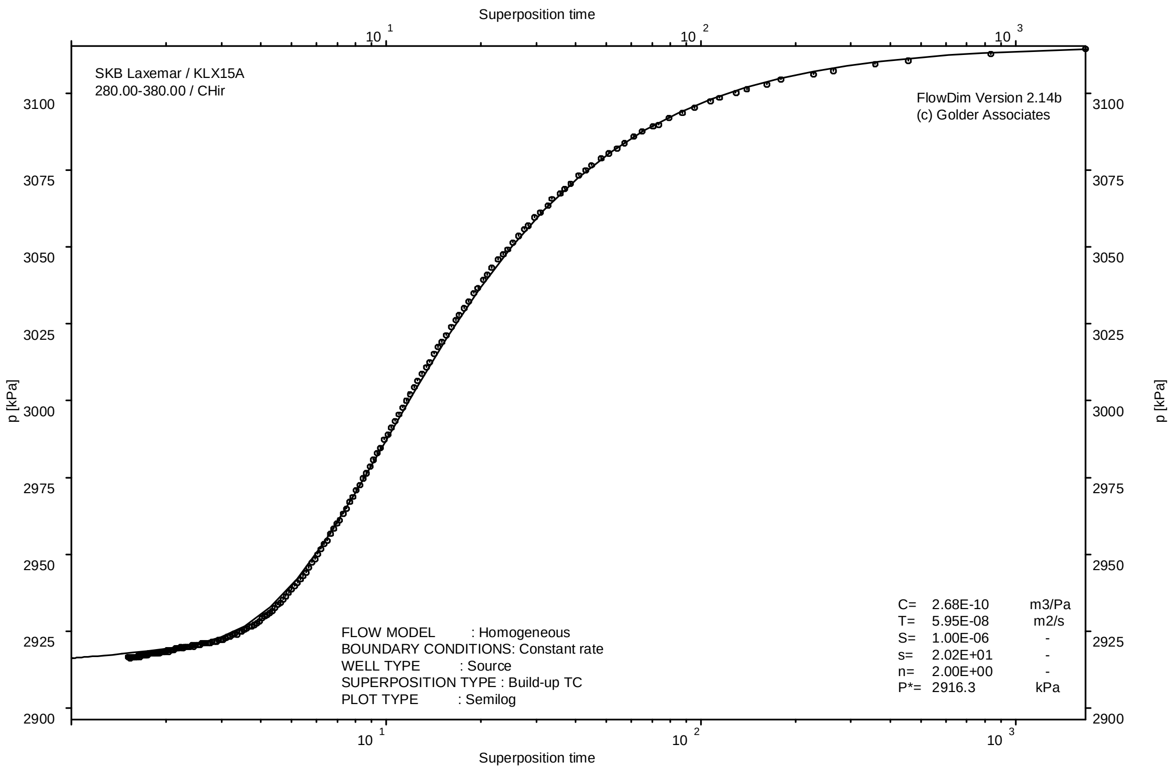
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

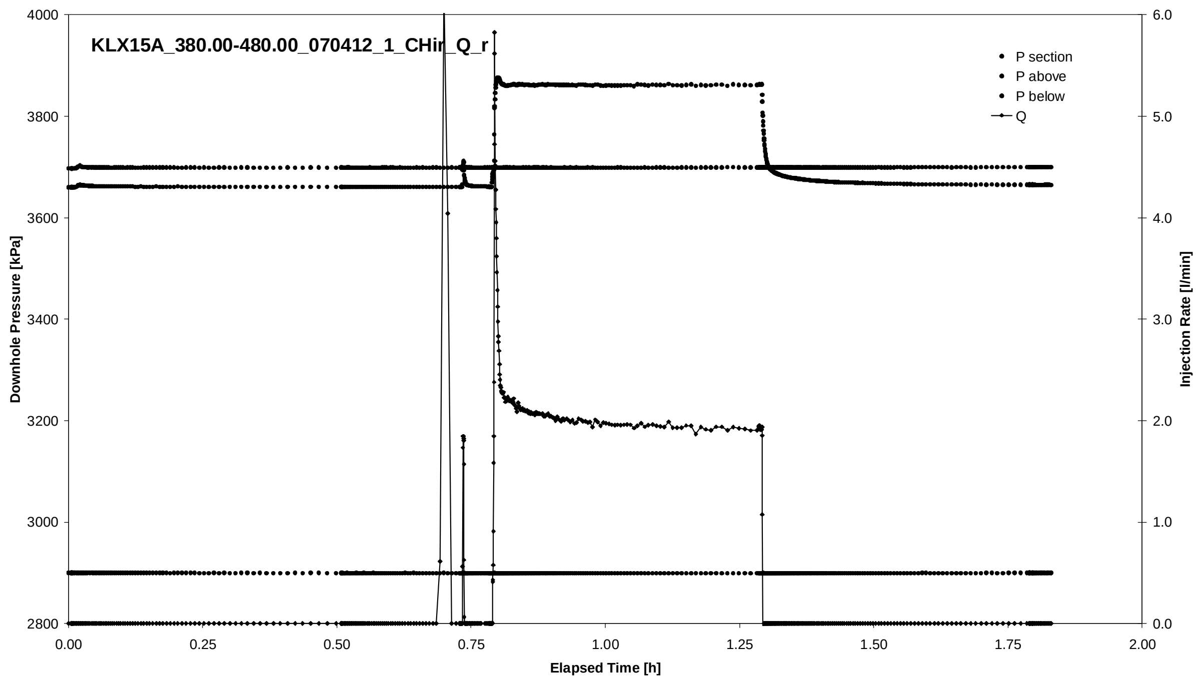


CHIR phase; HORNER match

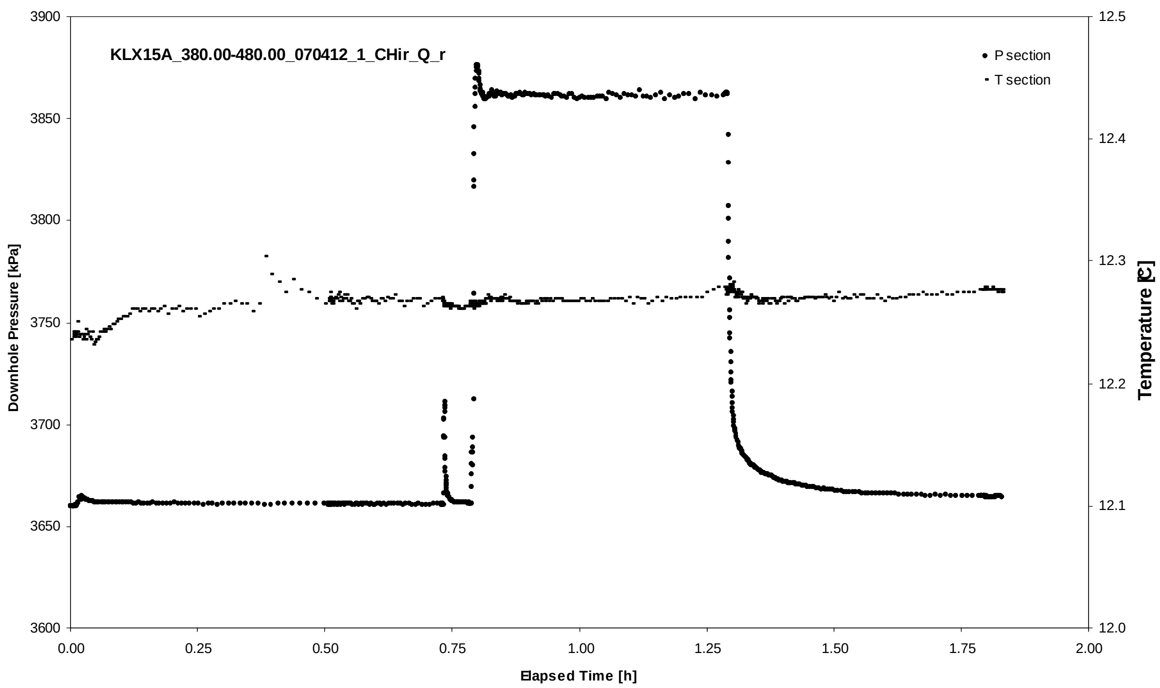
APPENDIX 2-4

Test 380.00 – 480.00 m

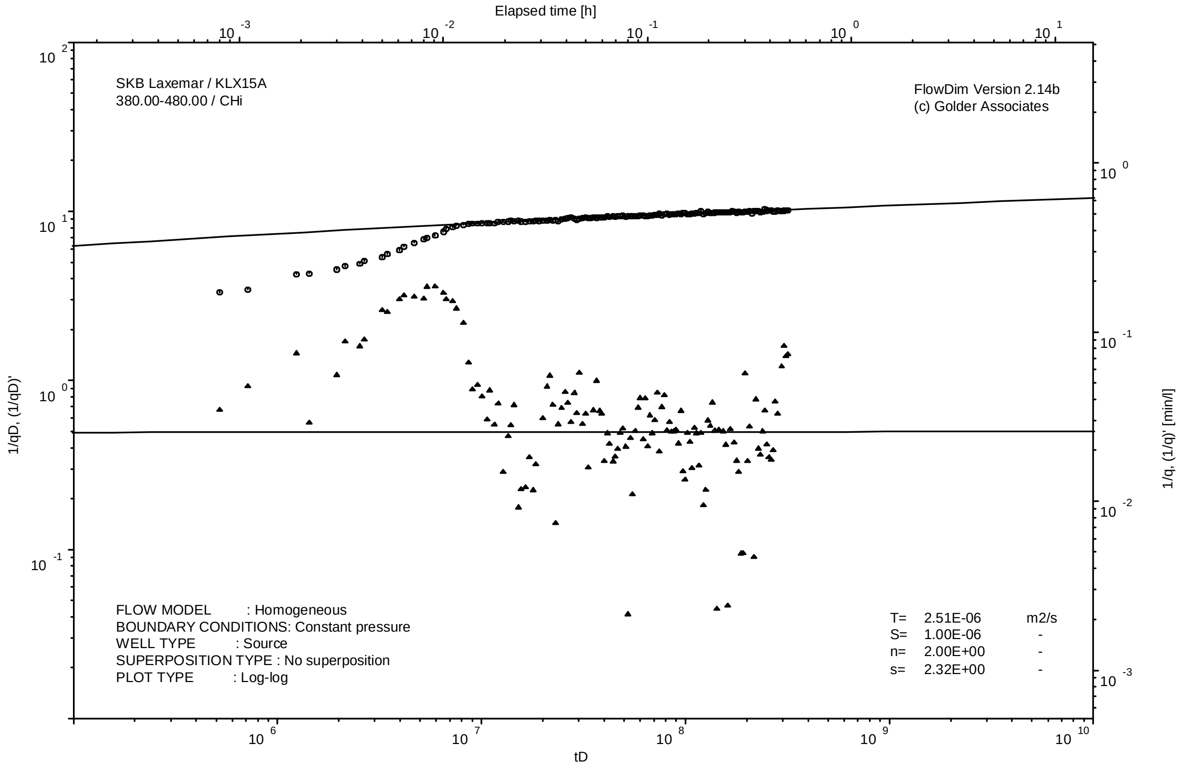
Analysis diagrams



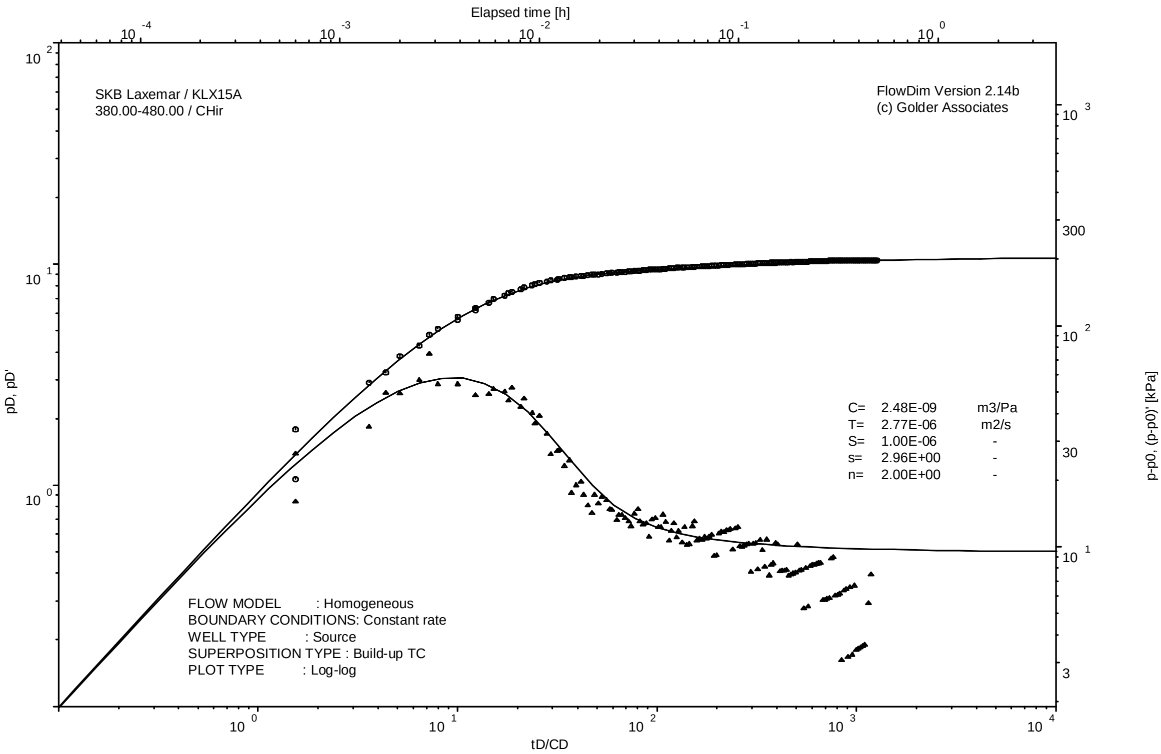
Pressure and flow rate vs. time; cartesian plot



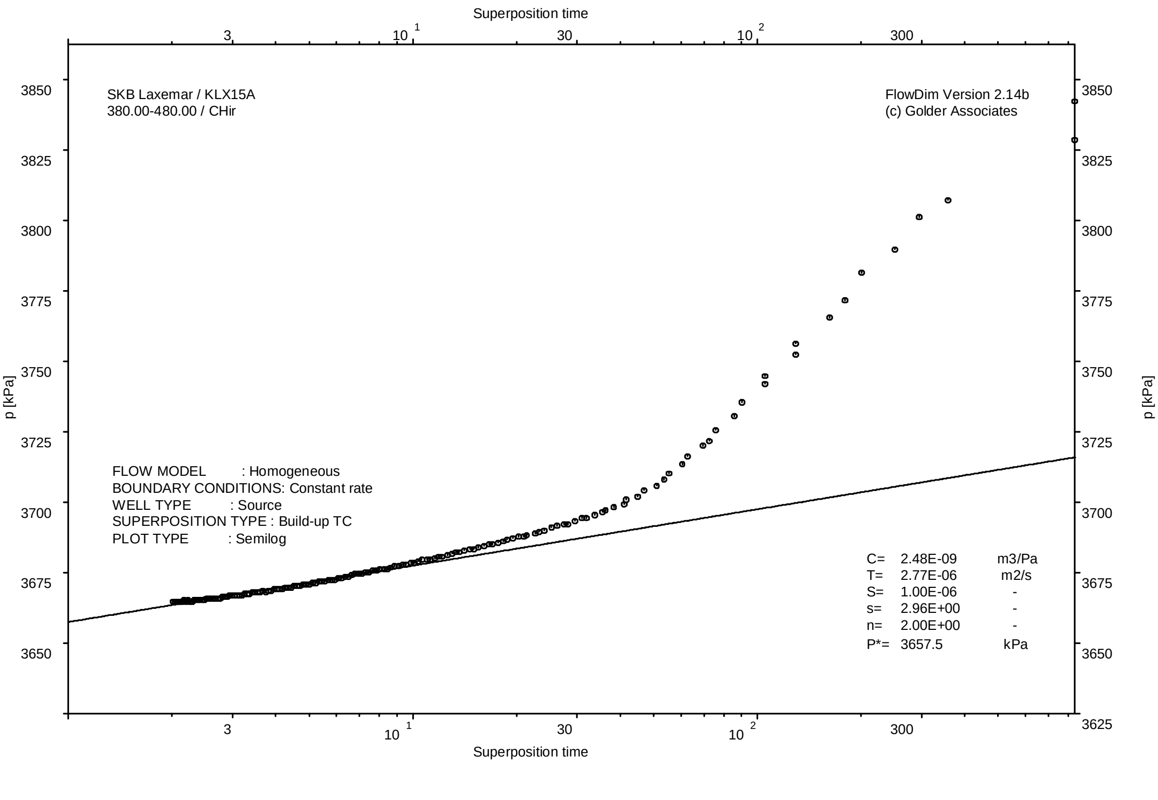
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

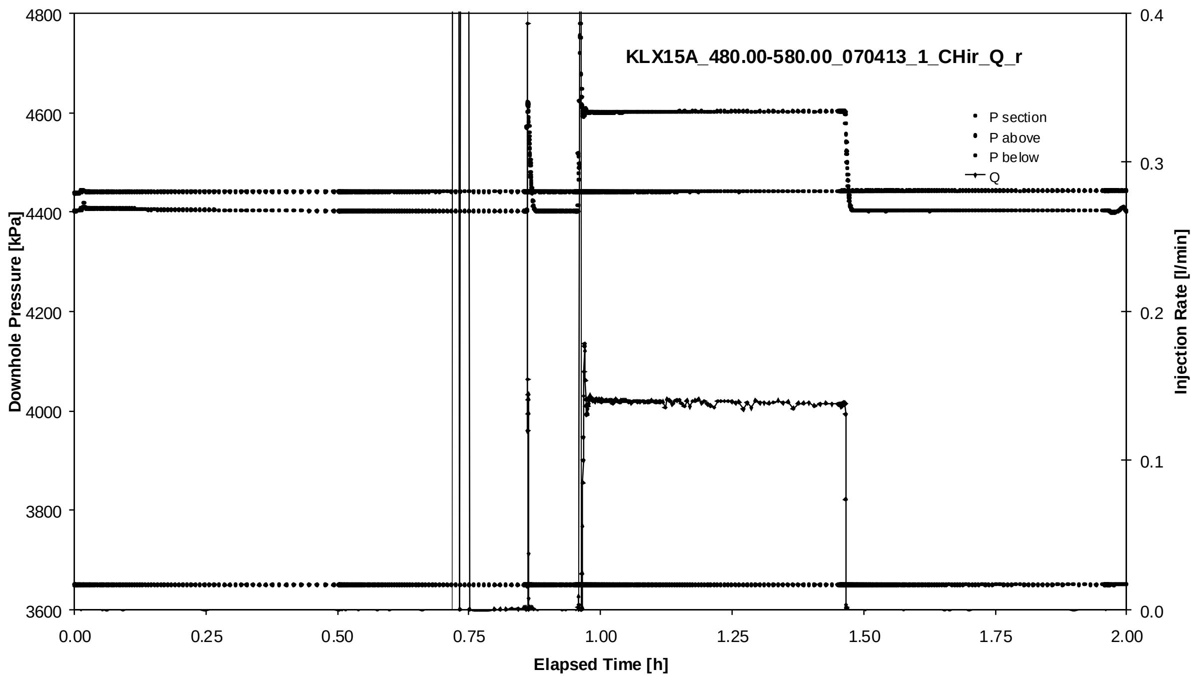


CHIR phase; HORNER match

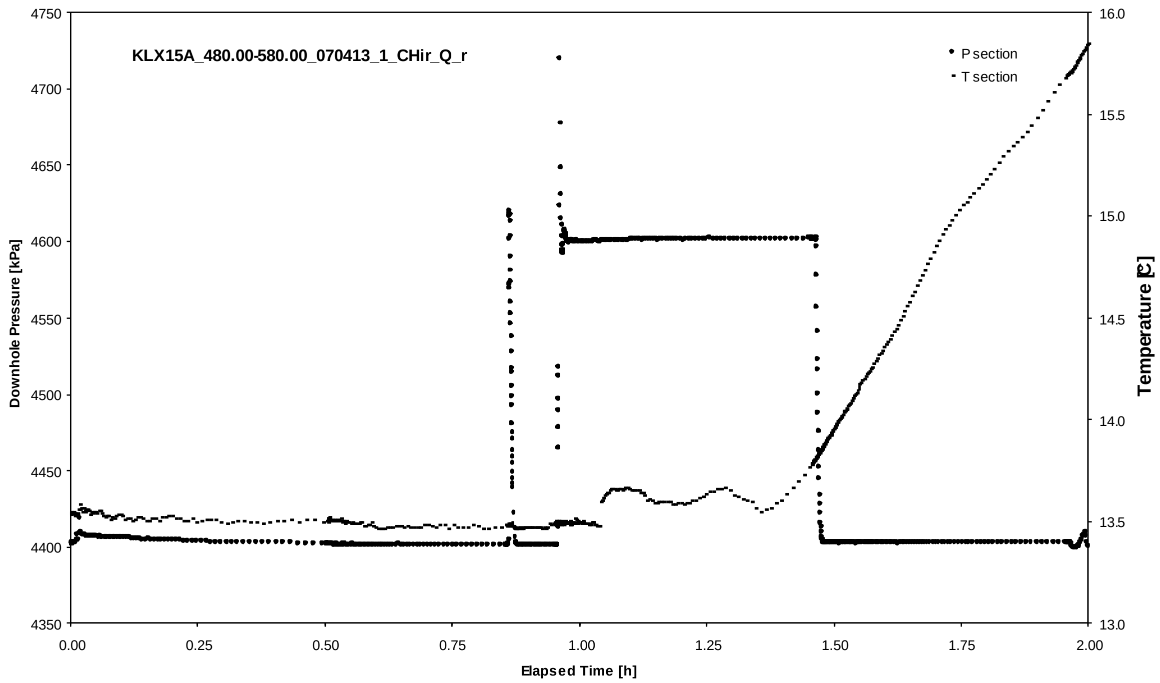
APPENDIX 2-5

Test 480.00 – 580.00 m

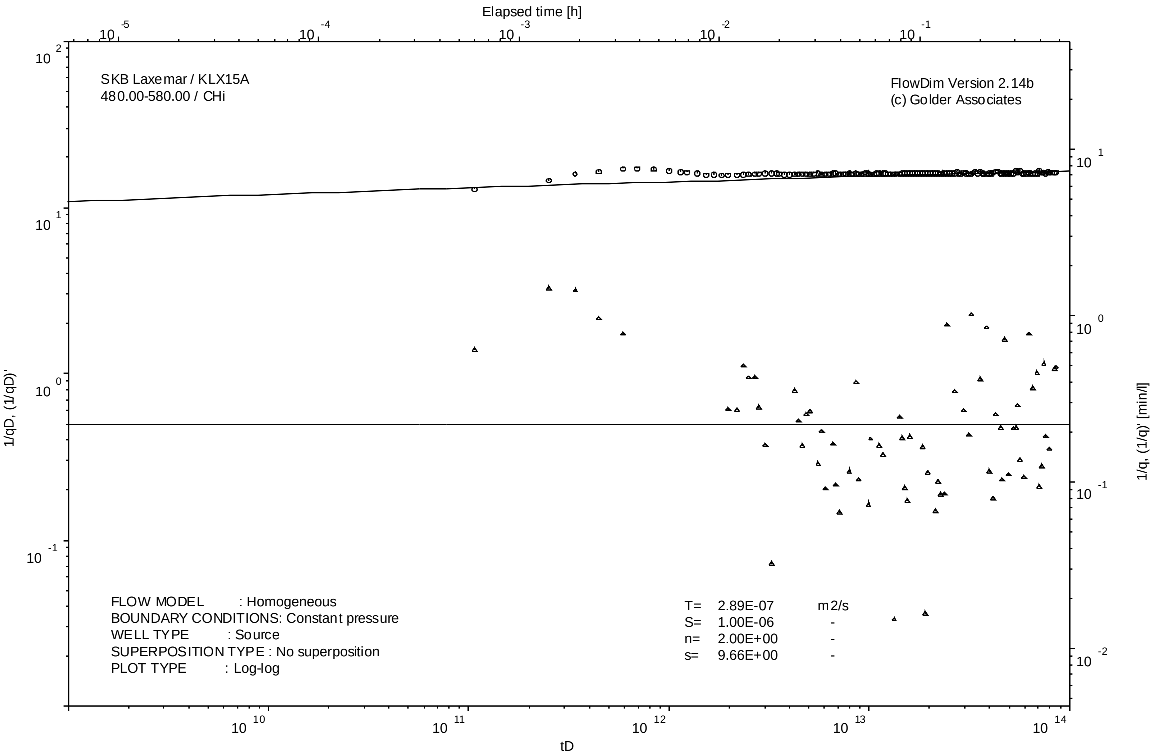
Analysis diagrams



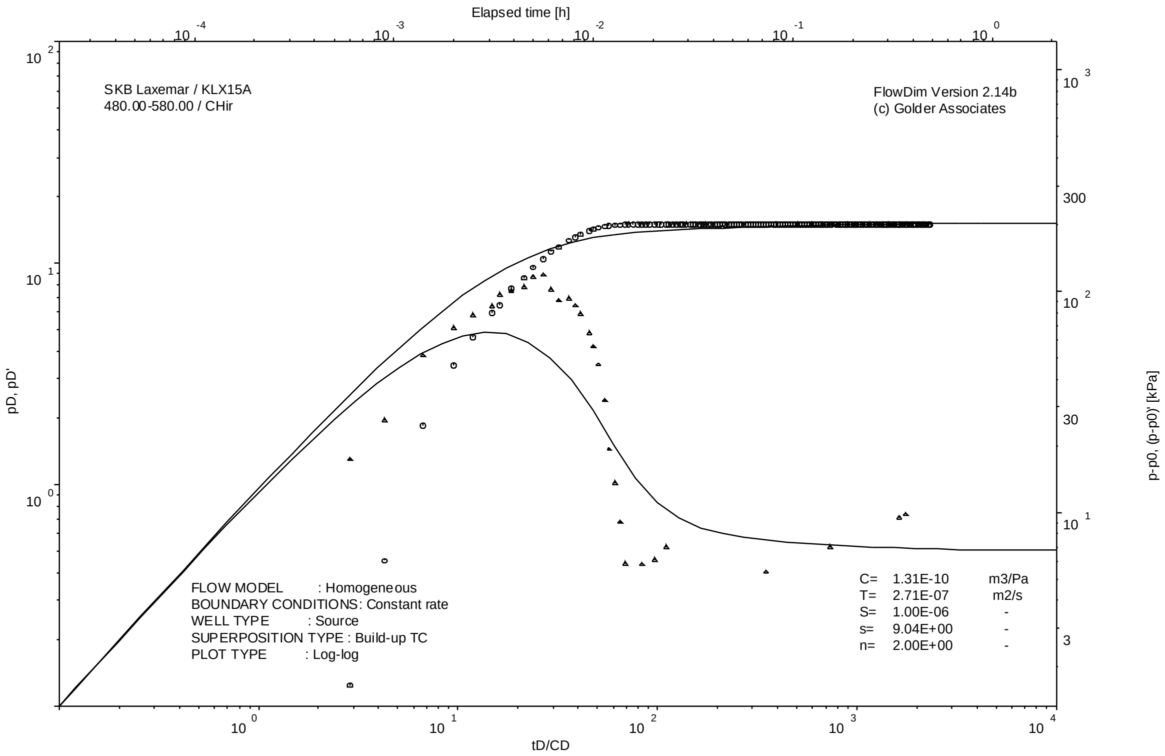
Pressure and flow rate vs. time; cartesian plot



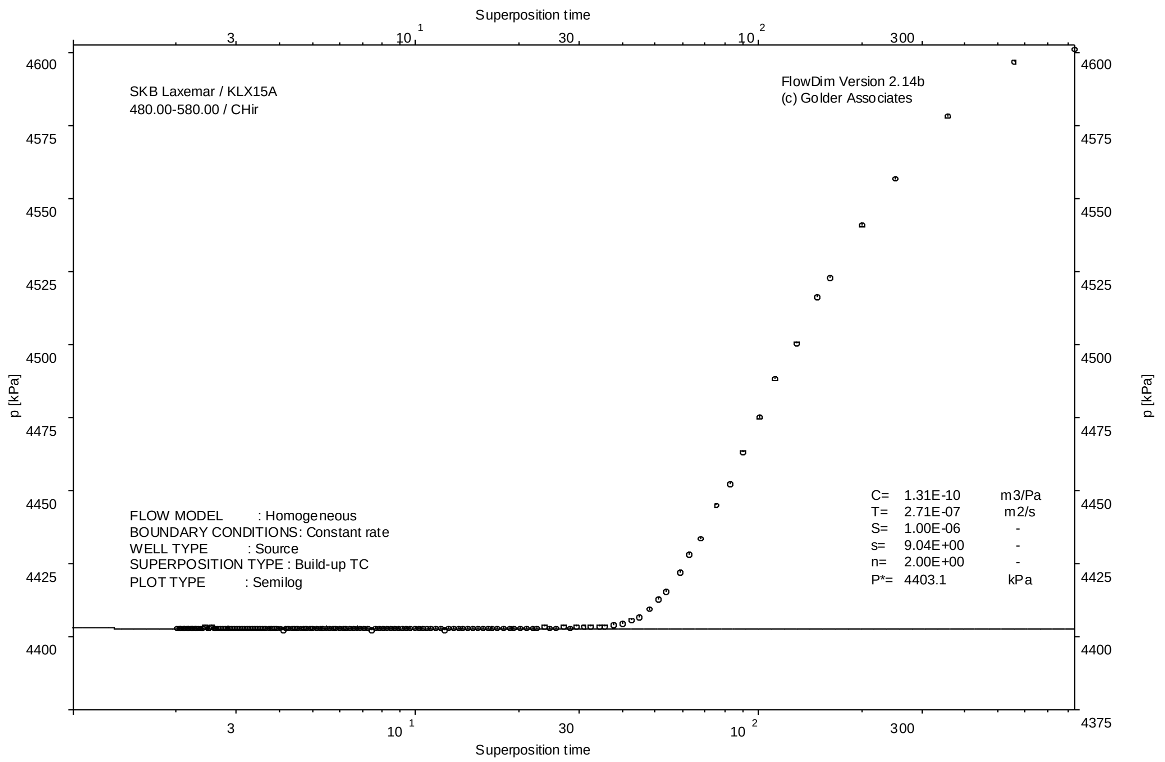
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

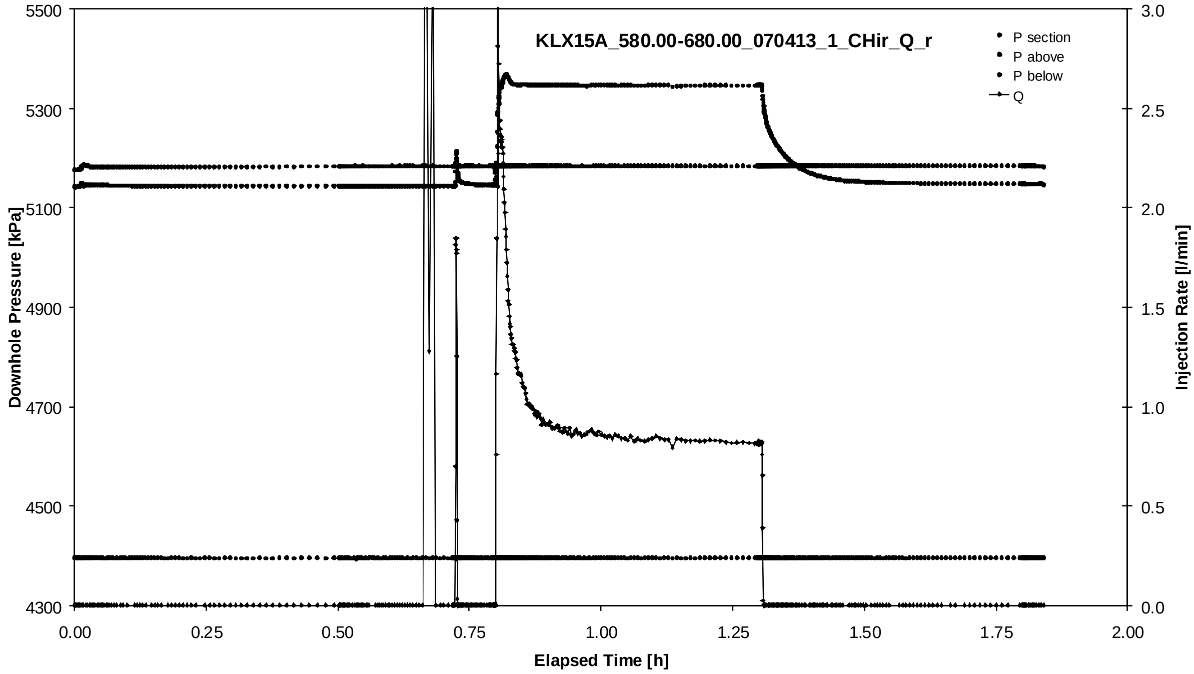


CHIR phase; HORNER match

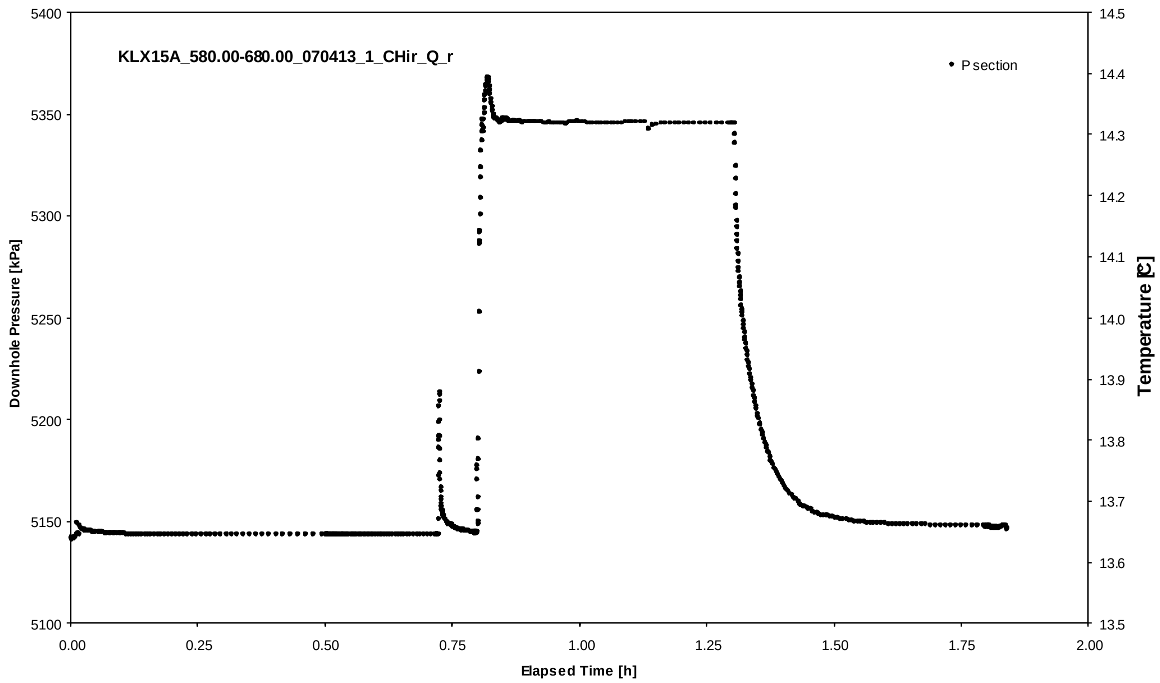
APPENDIX 2-6

Test 580.00 – 680.00 m

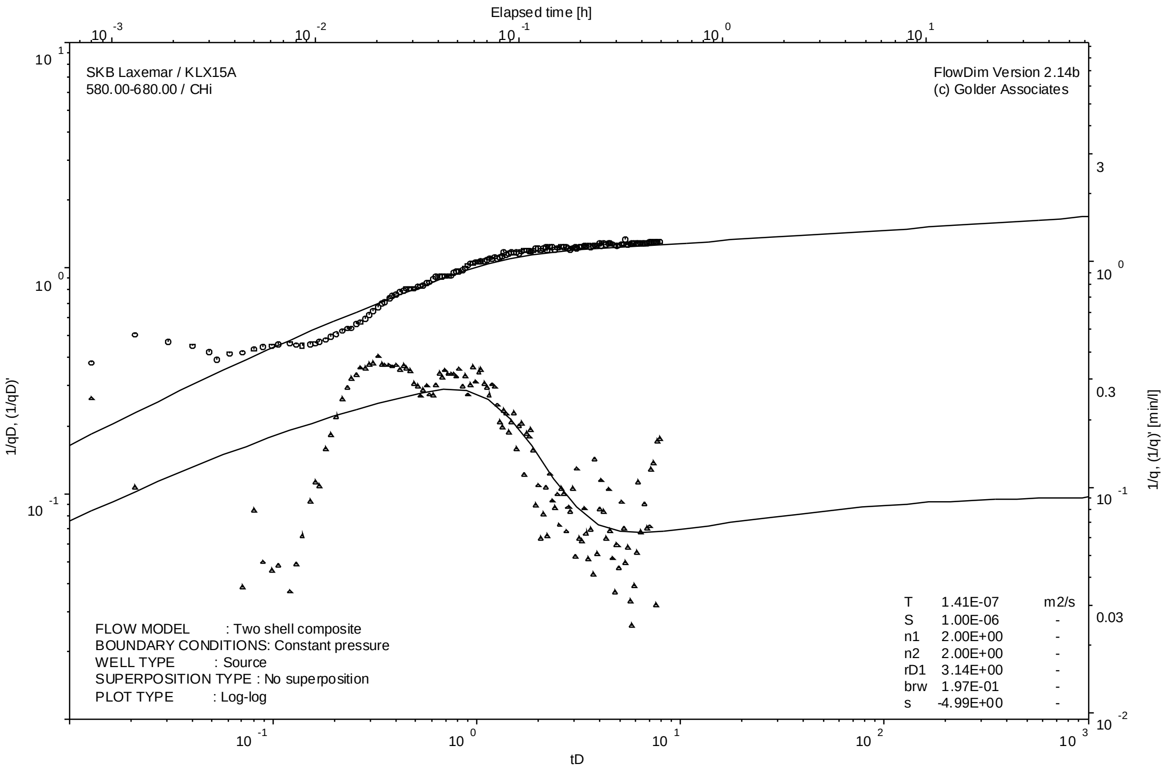
Analysis diagrams



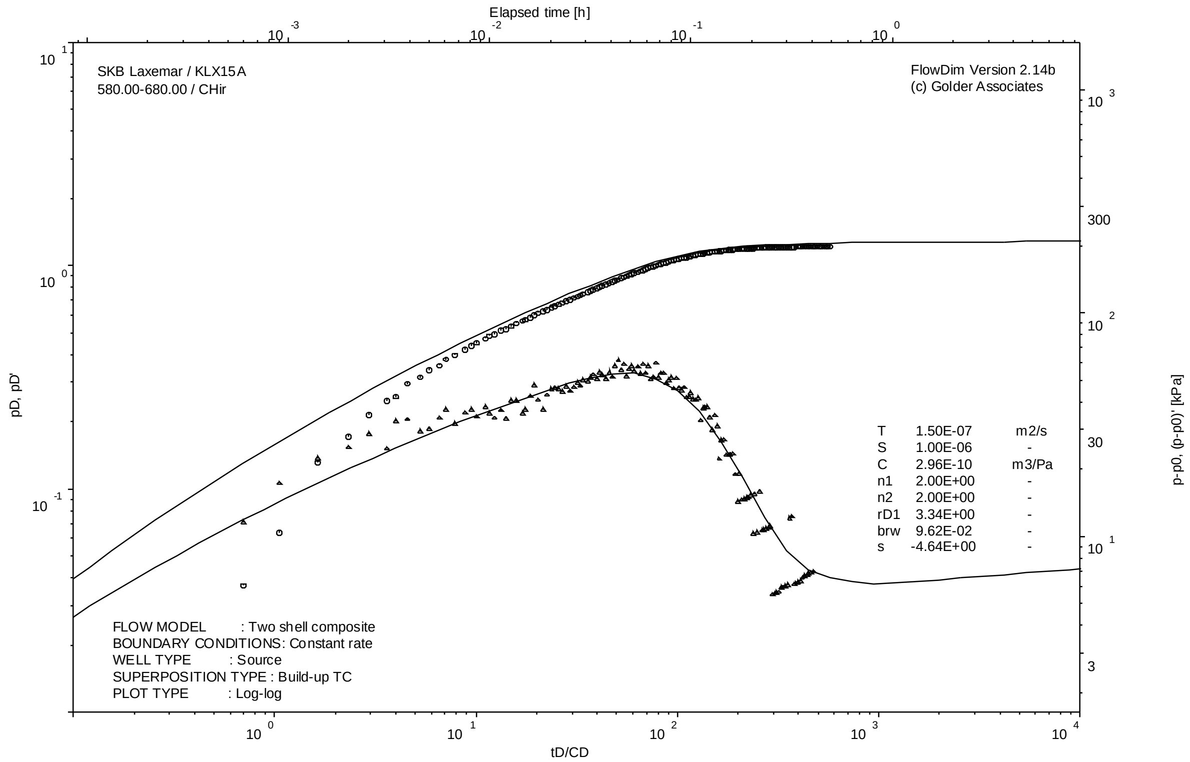
Pressure and flow rate vs. time; cartesian plot



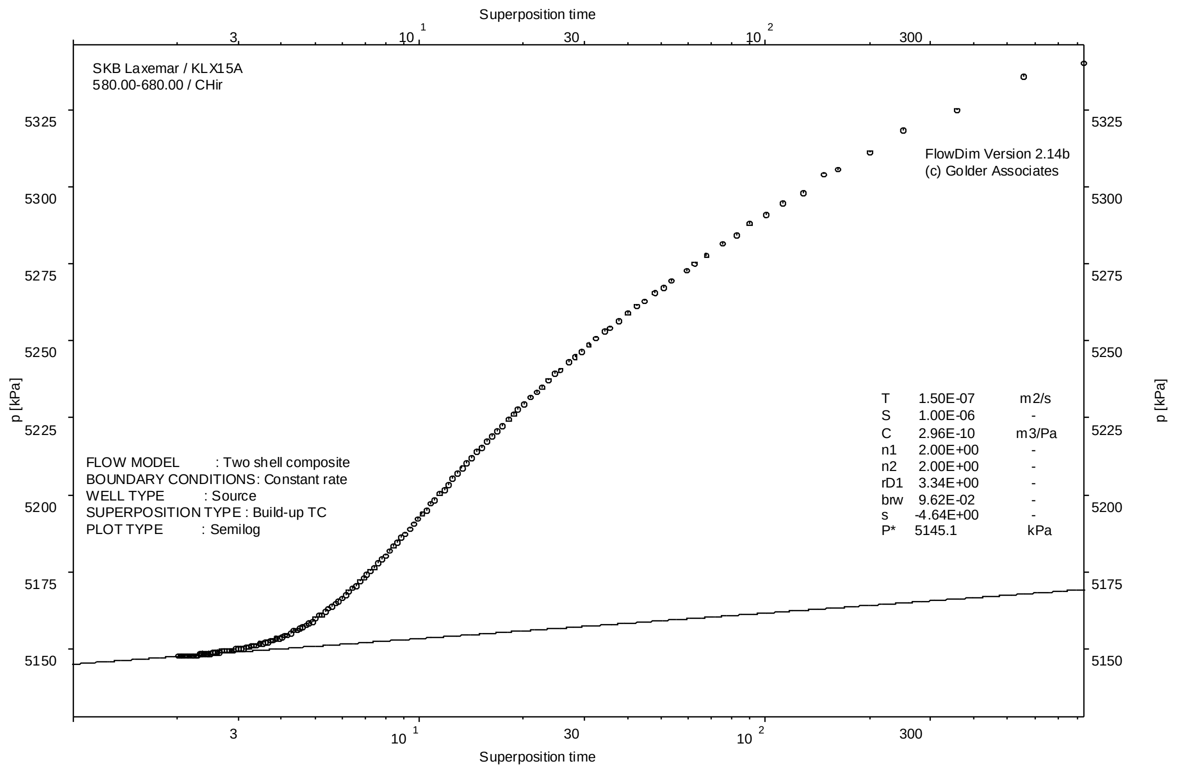
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

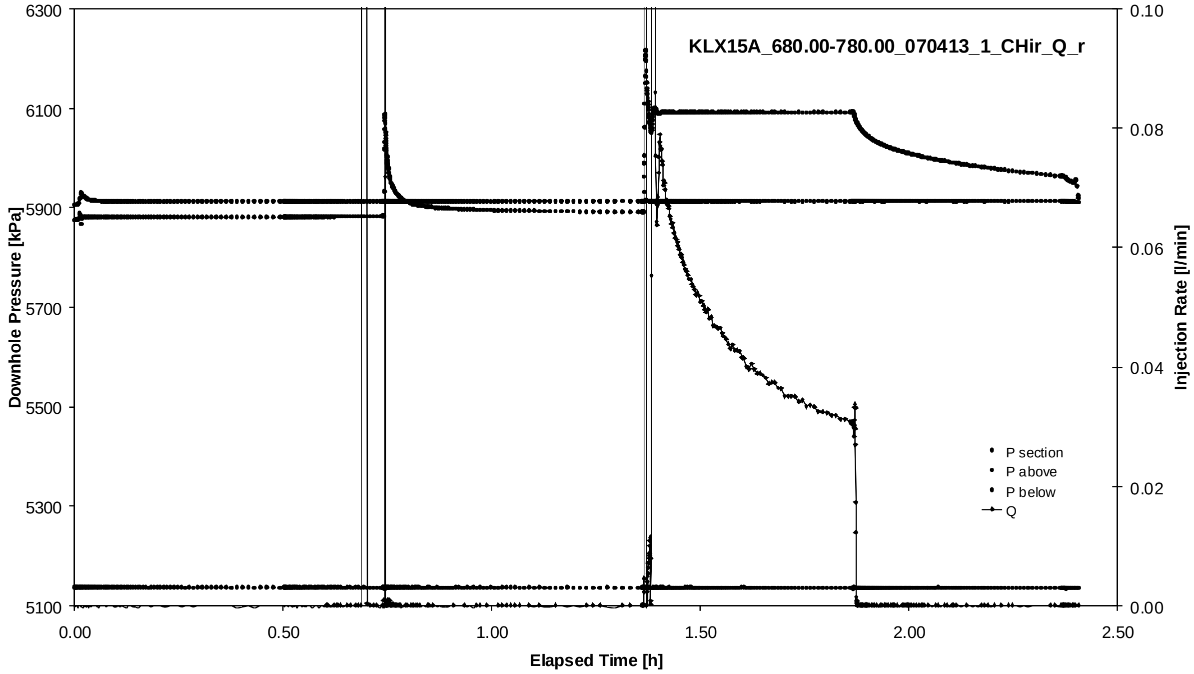


CHIR phase; HORNER match

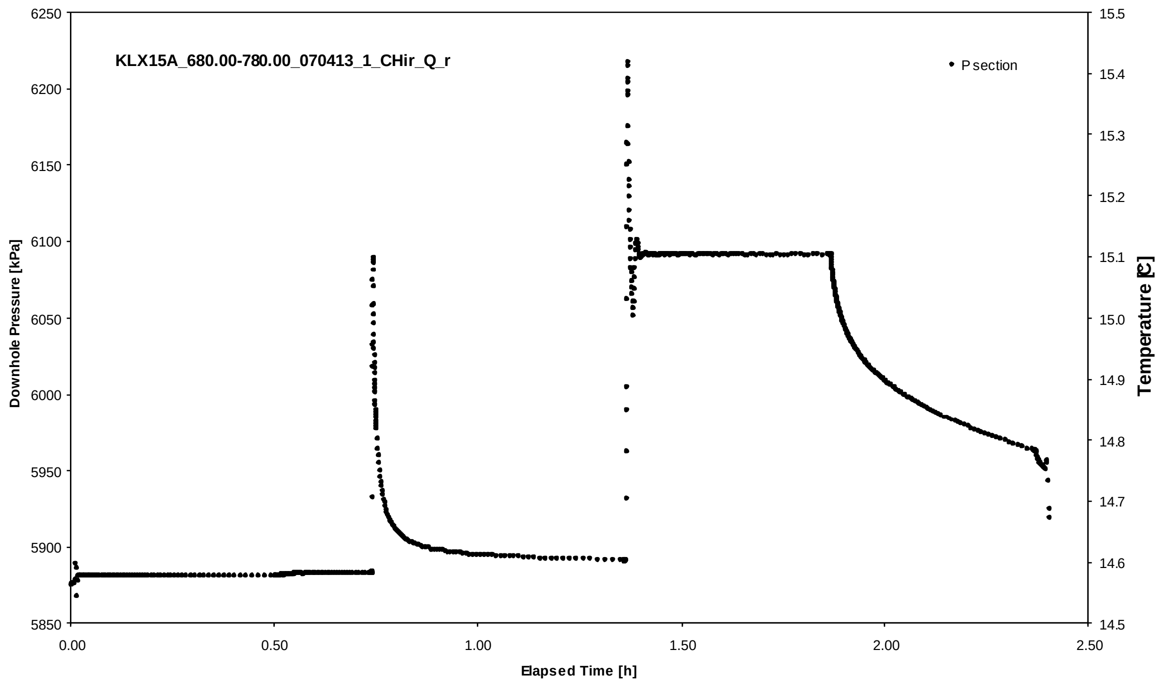
APPENDIX 2-7

Test 680.00 – 780.00 m

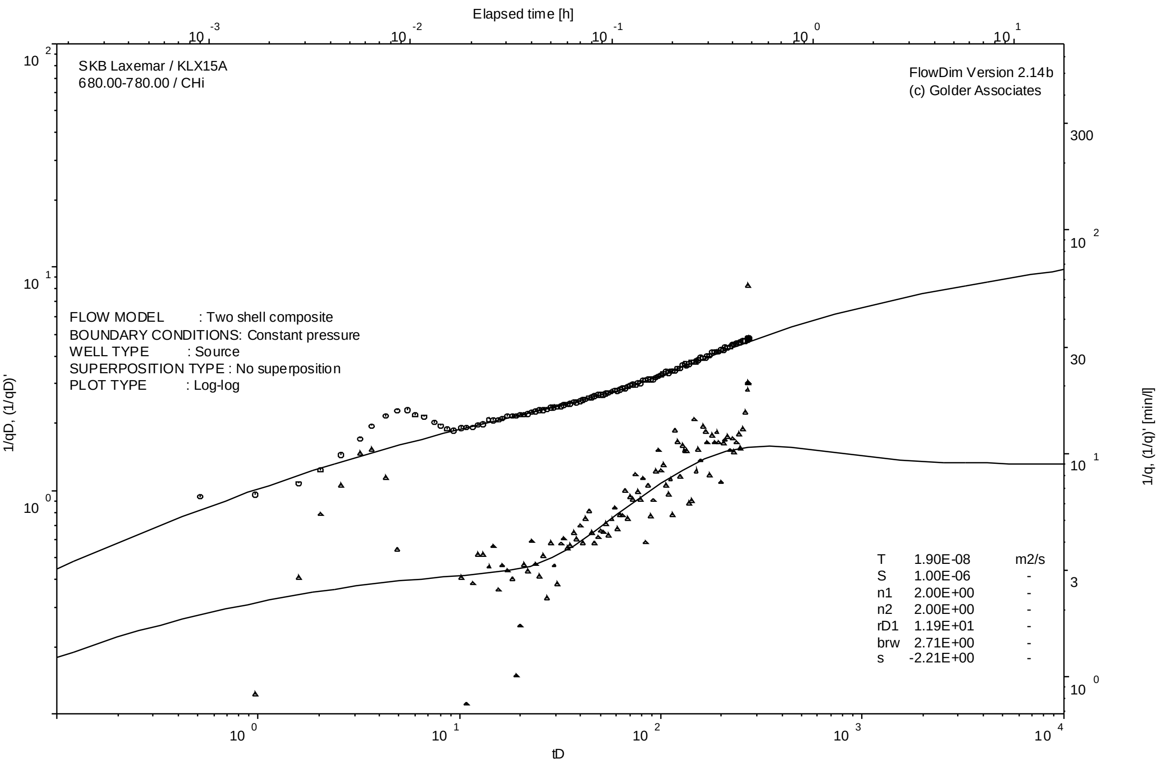
Analysis diagrams



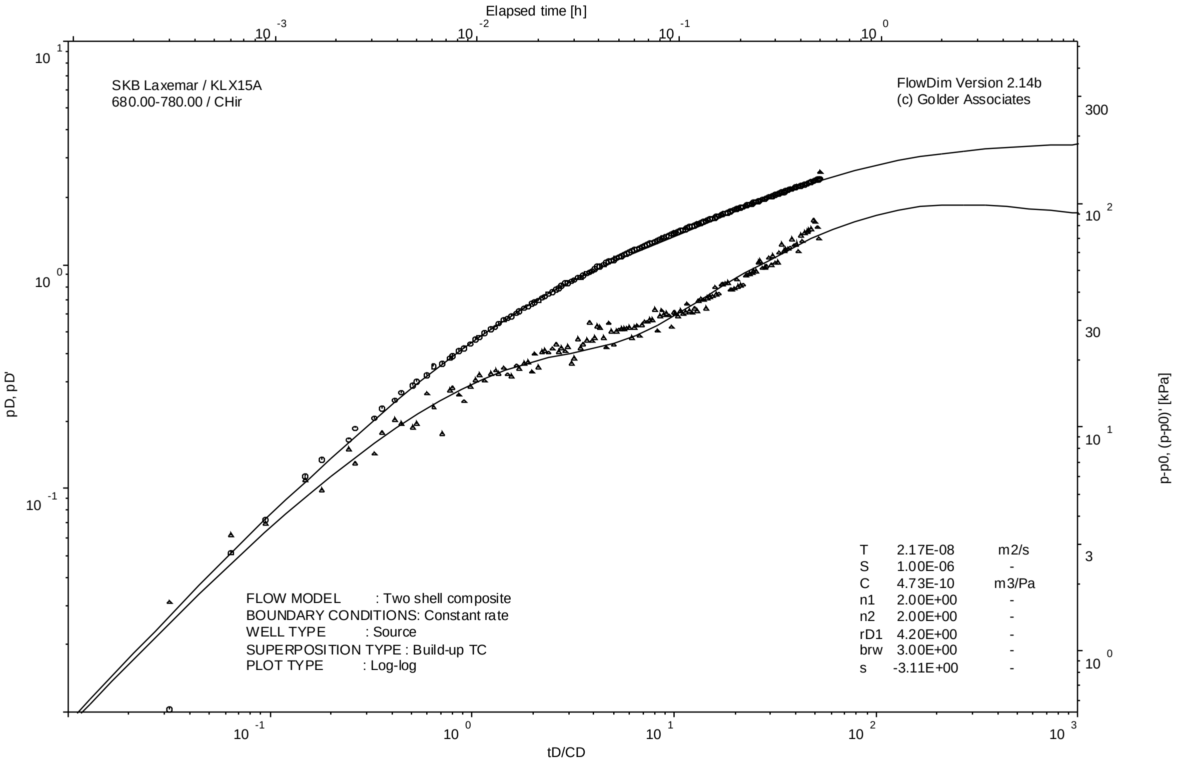
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

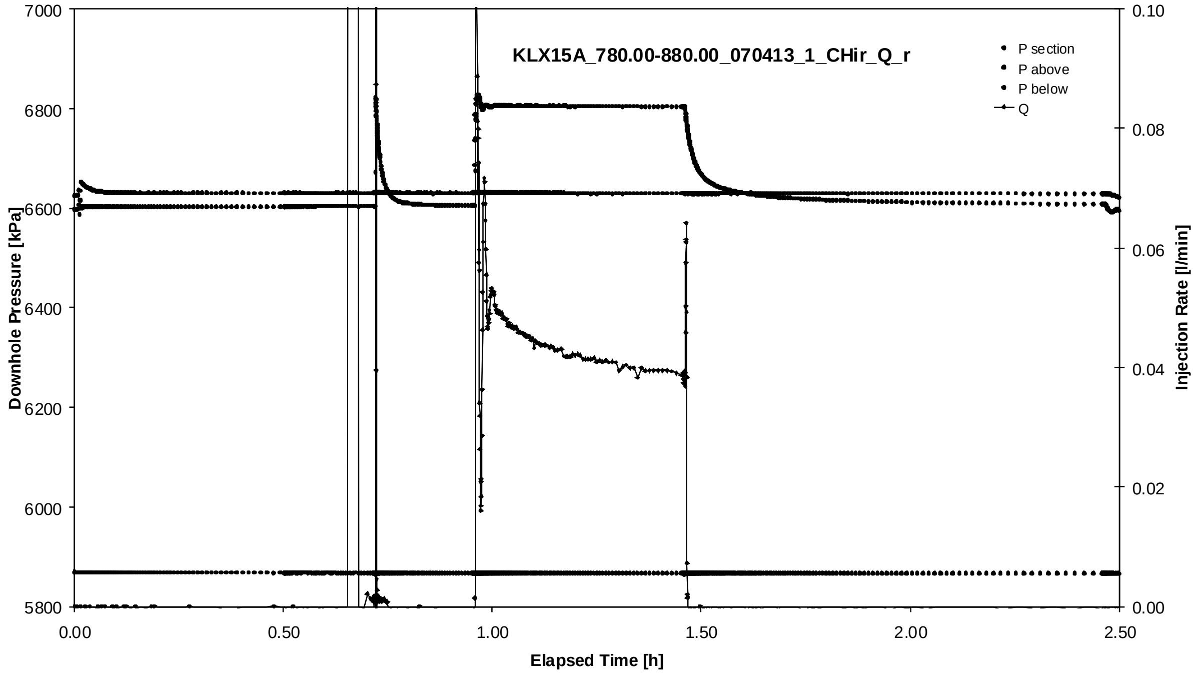
Not analysable

CHIR phase; HORNER match

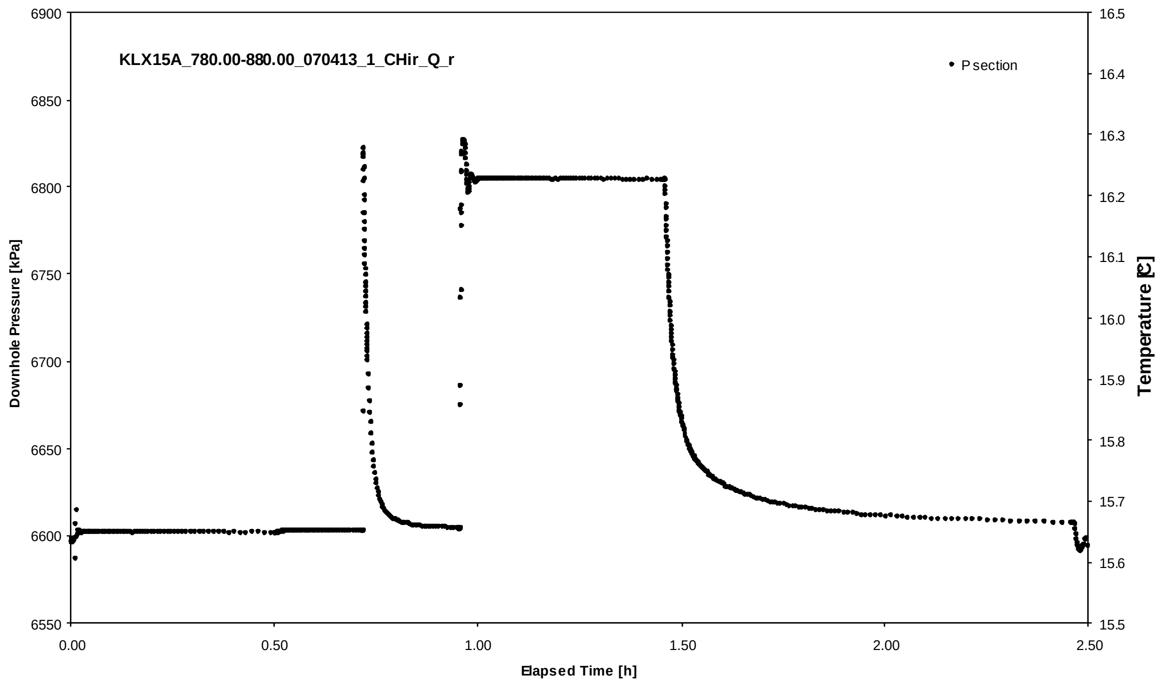
APPENDIX 2-8

Test 780.00 – 880.00 m

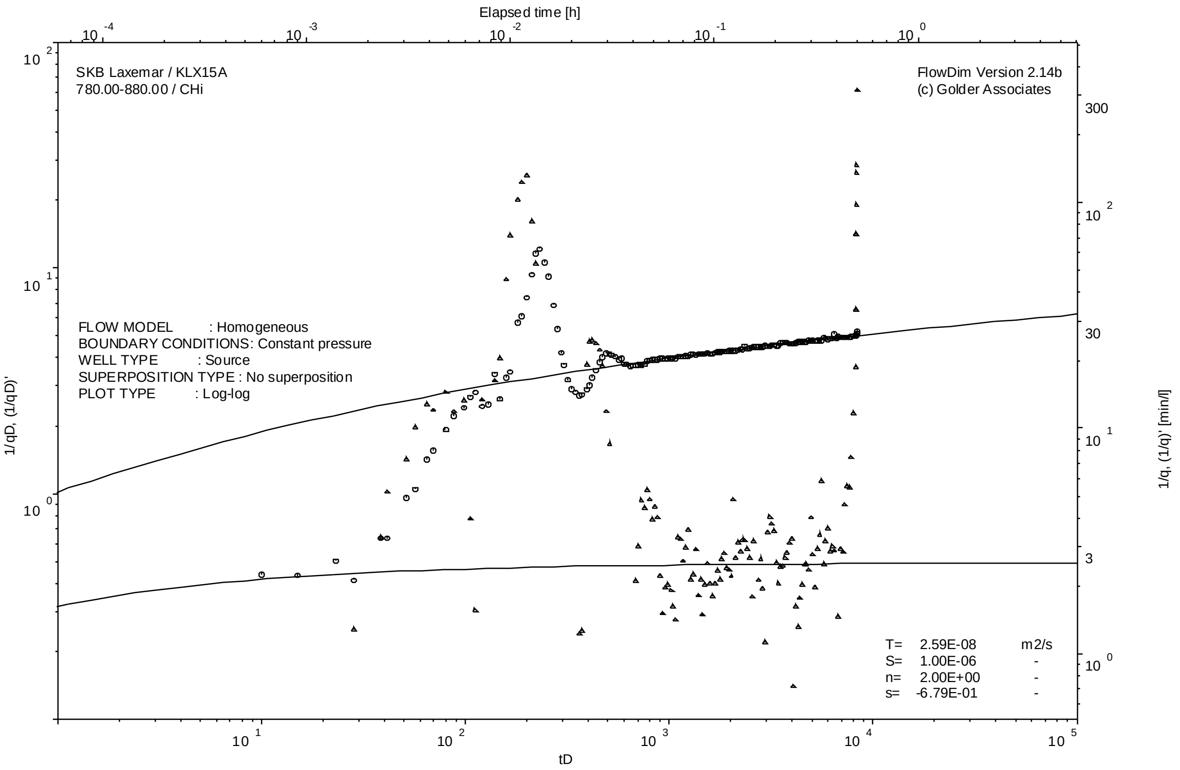
Analysis diagrams



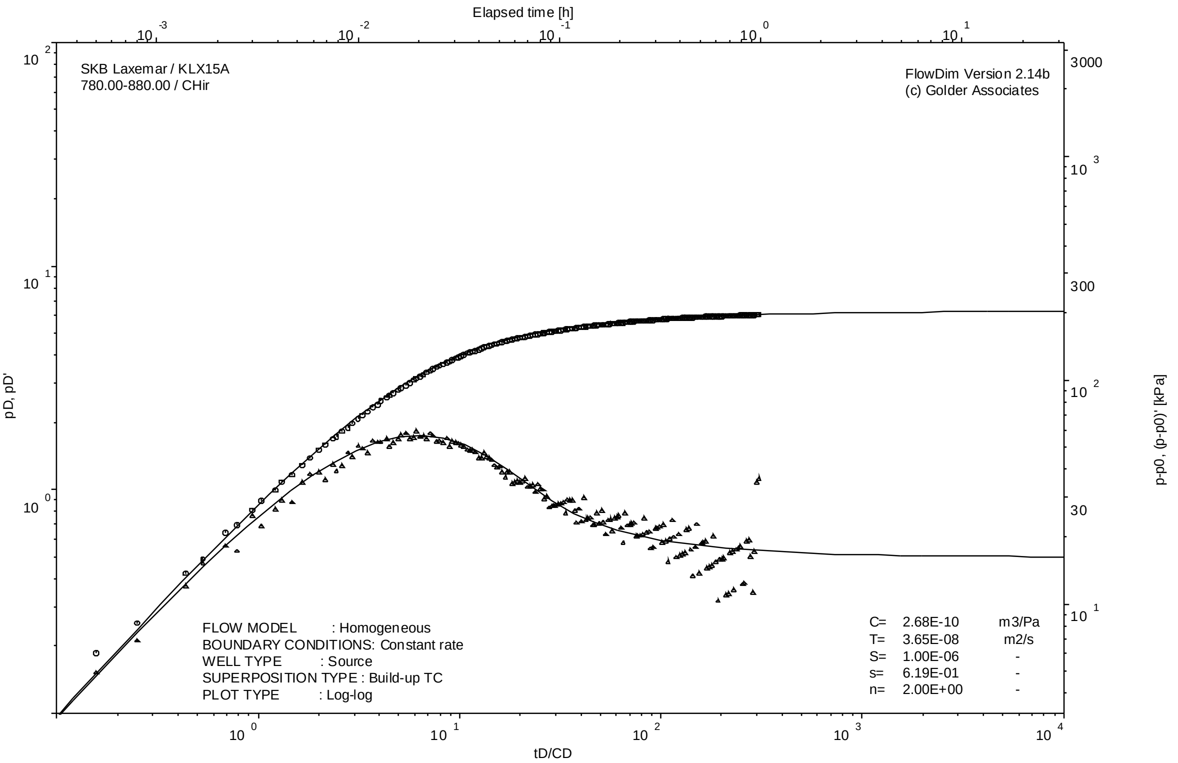
Pressure and flow rate vs. time; cartesian plot



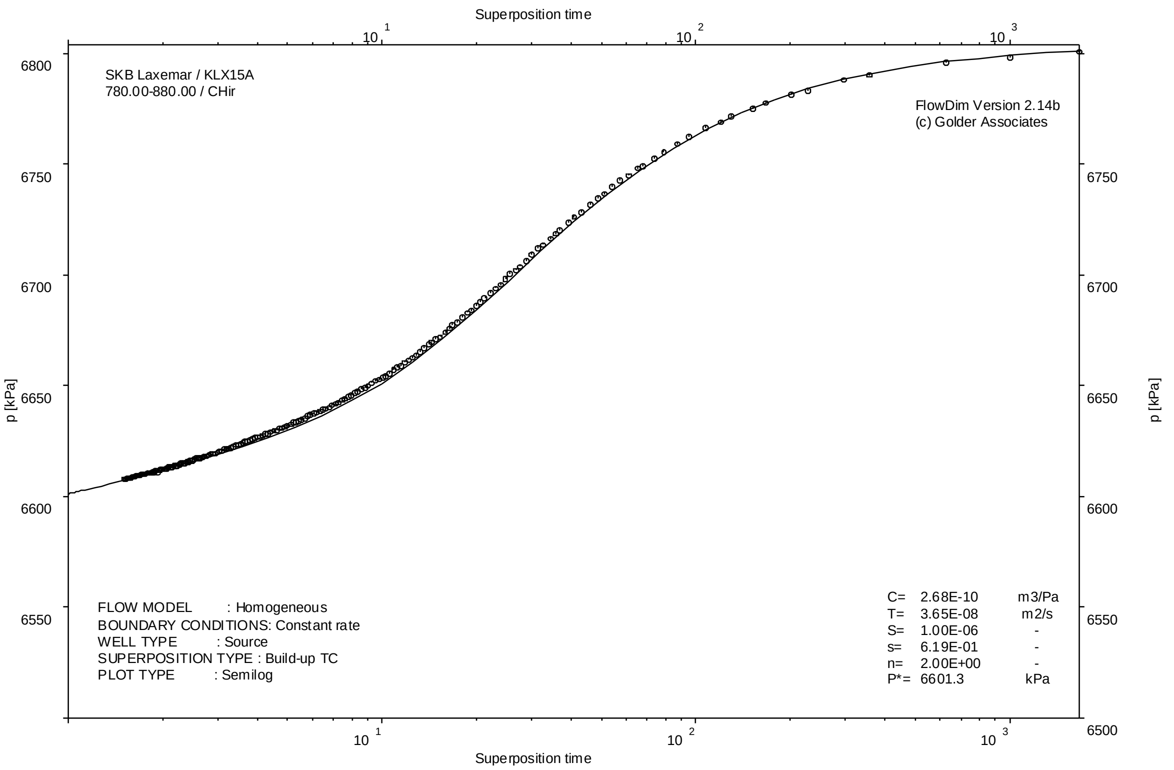
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

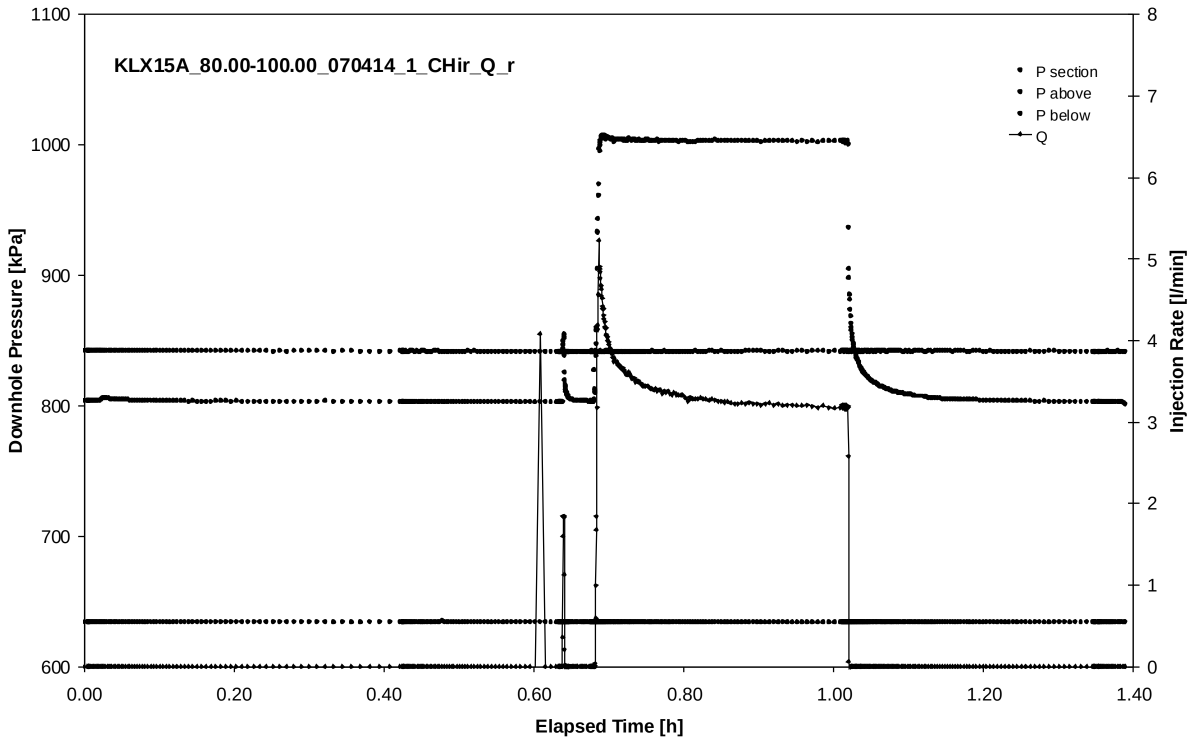


CHIR phase; HORNER match

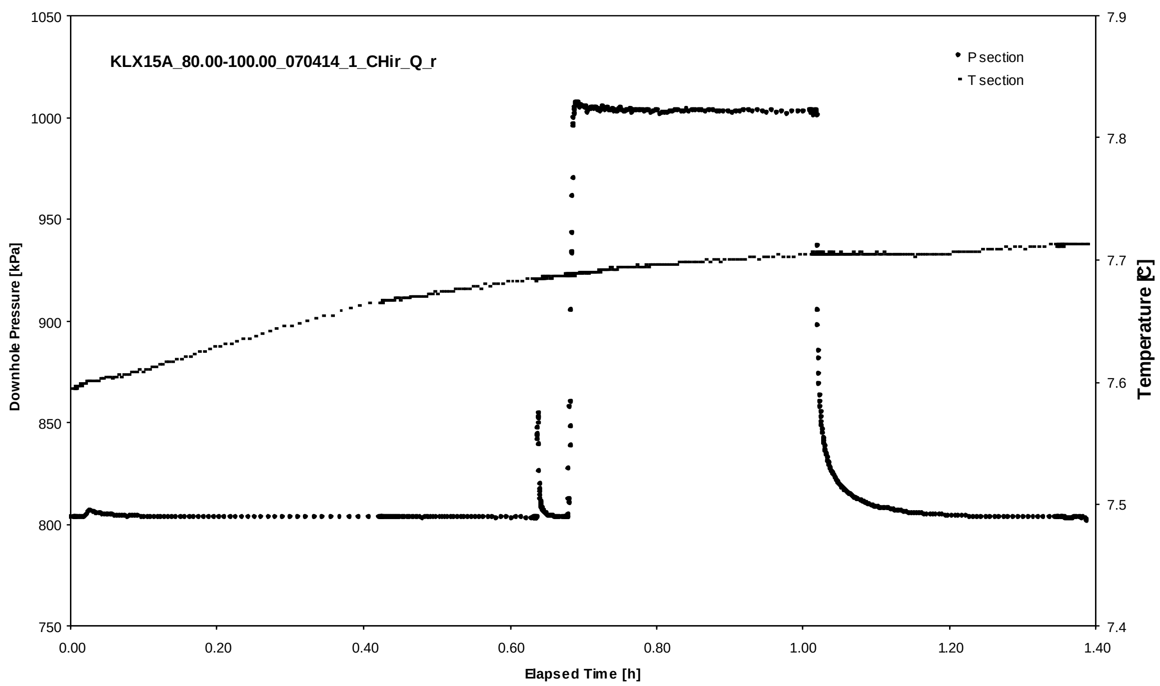
APPENDIX 2-9

Test 80.00 – 100.00 m

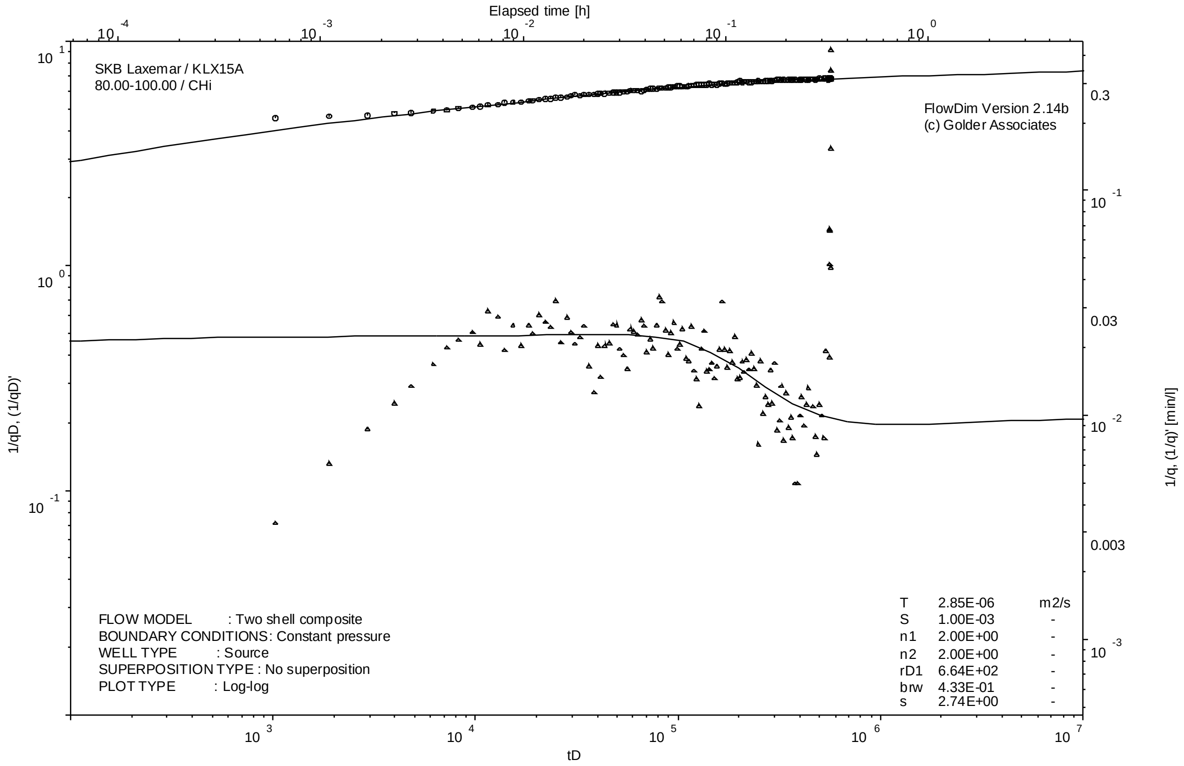
Analysis diagrams



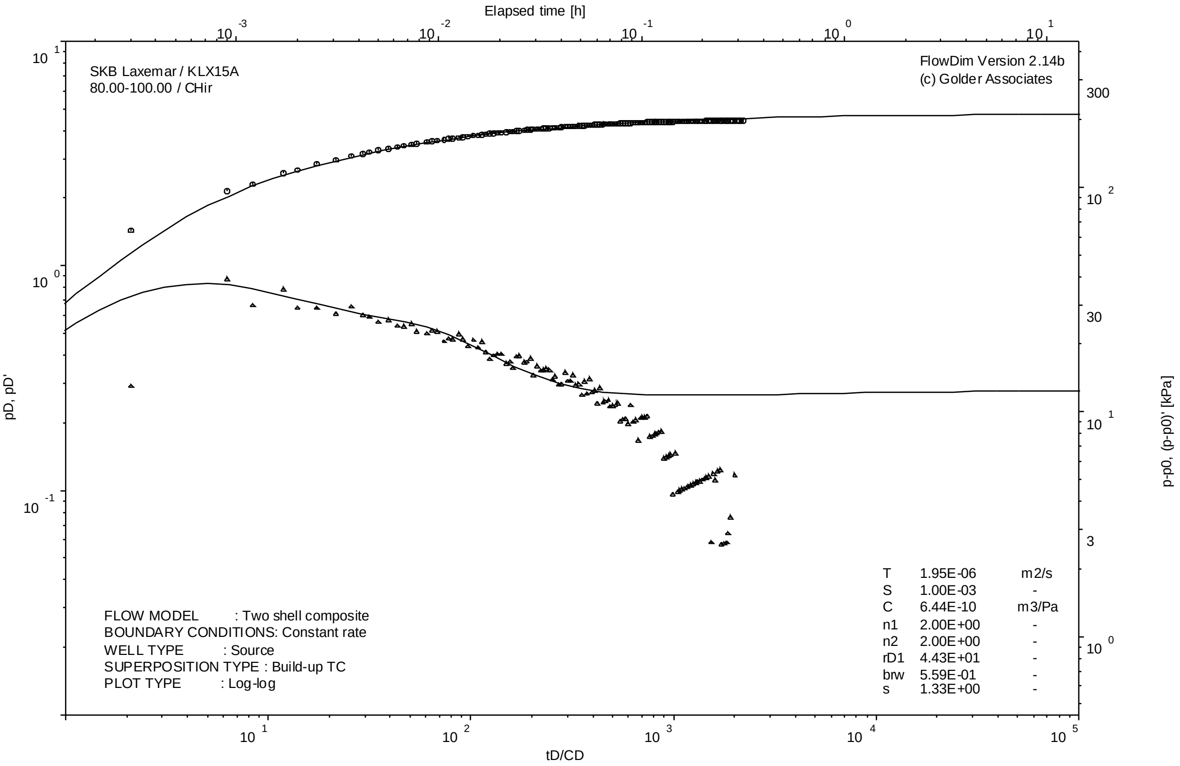
Pressure and flow rate vs. time; cartesian plot



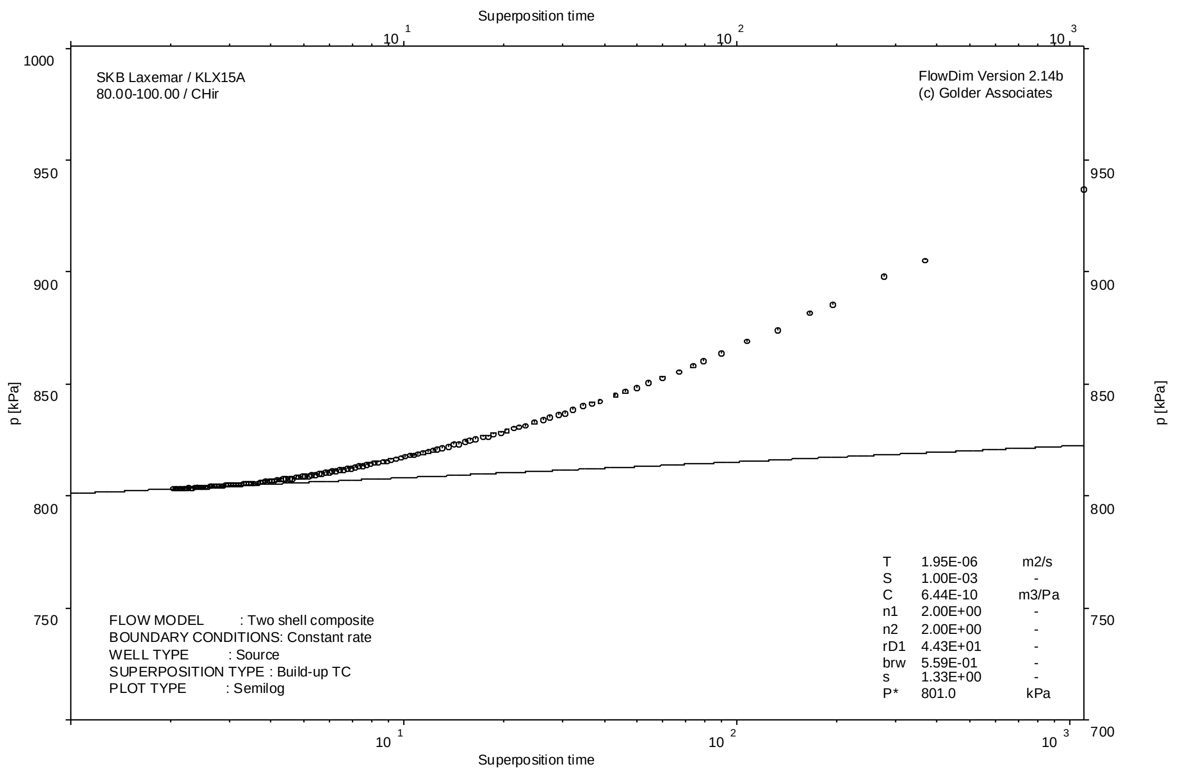
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

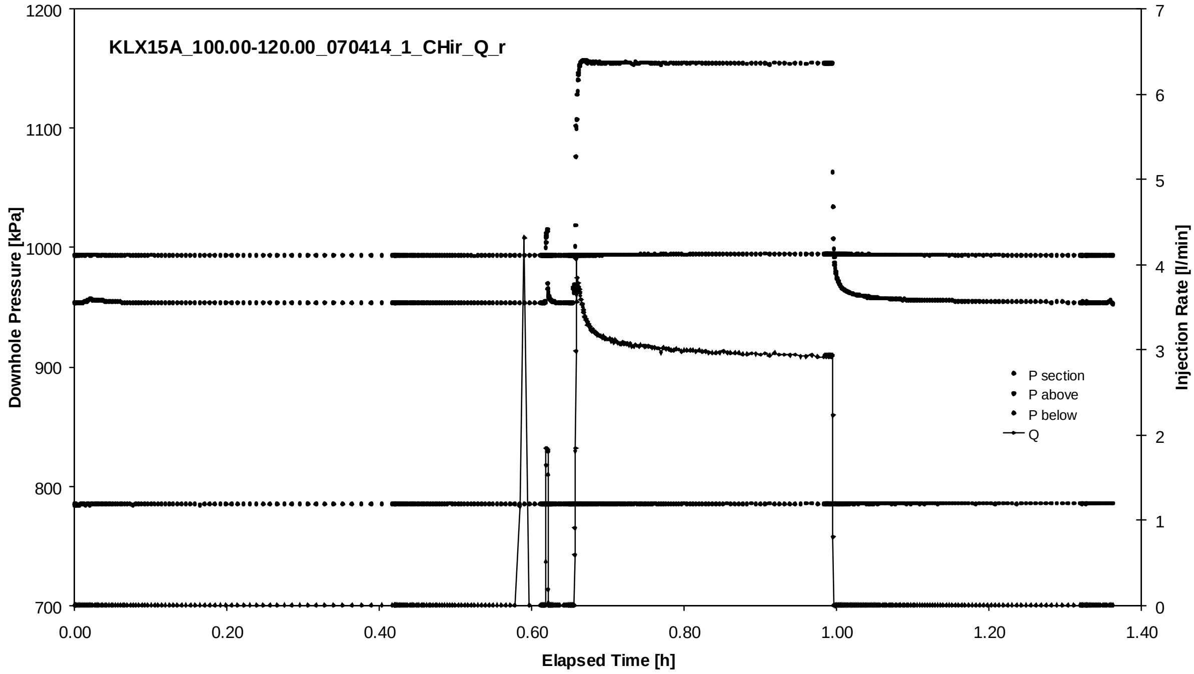


CHIR phase; HORNER match

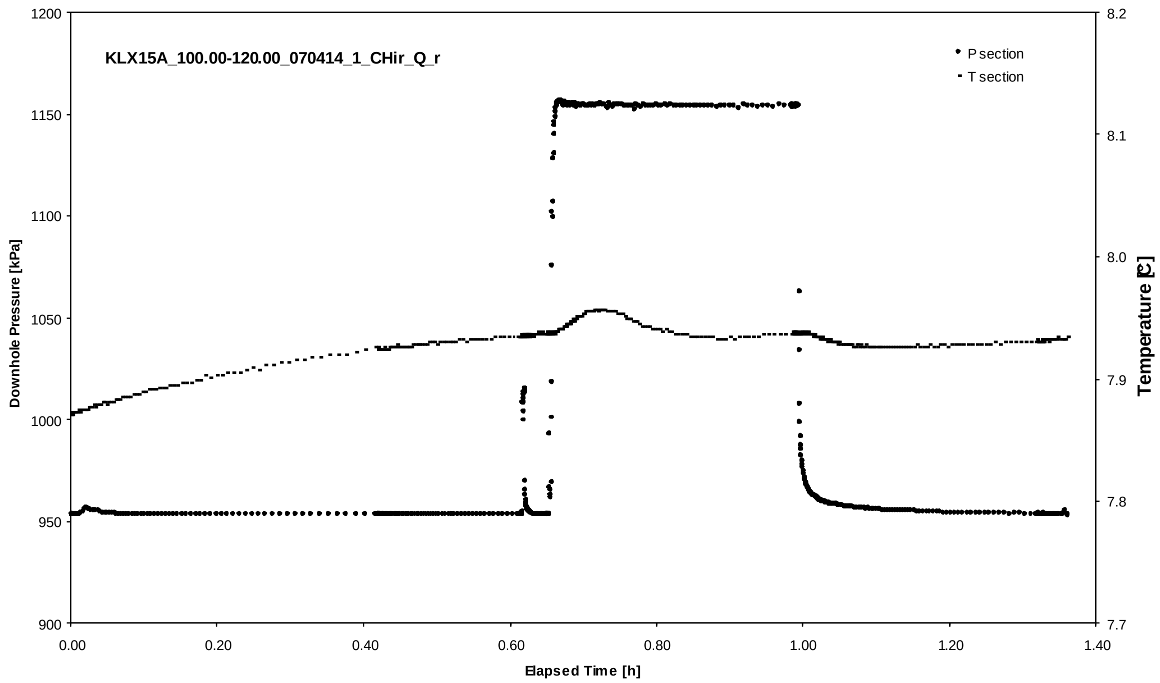
APPENDIX 2-10

Test 100.00 – 120.00 m

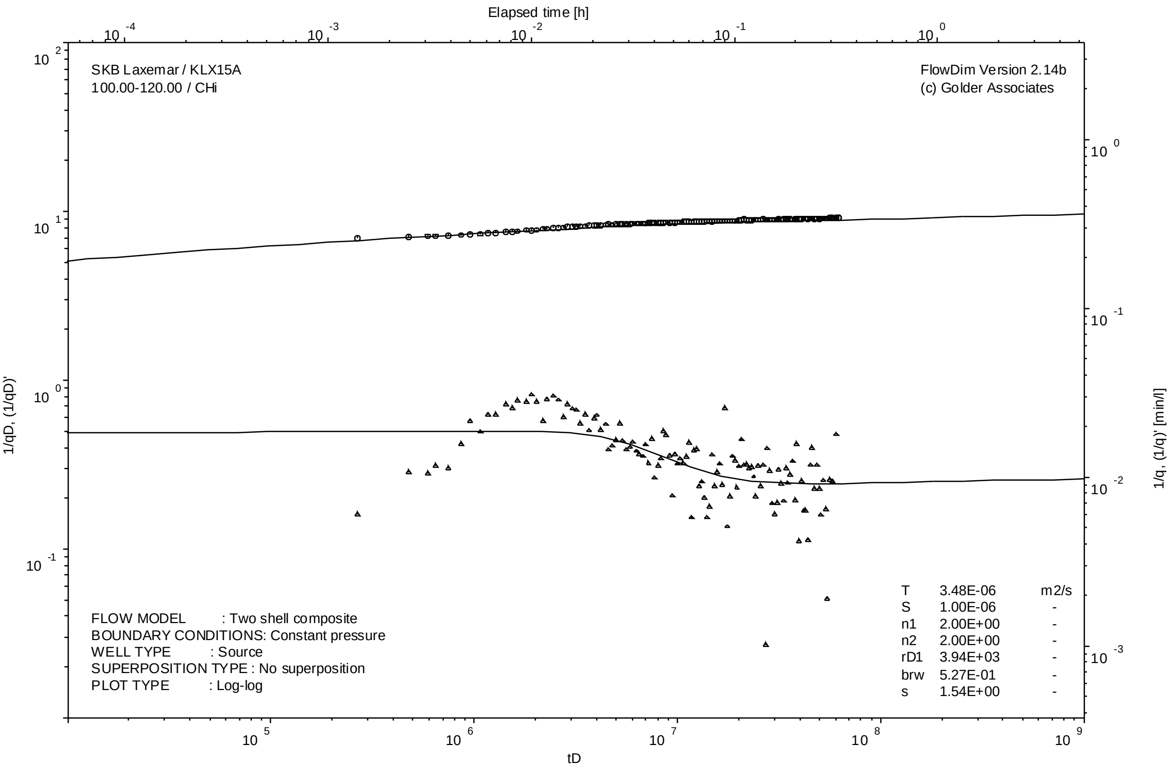
Analysis diagrams



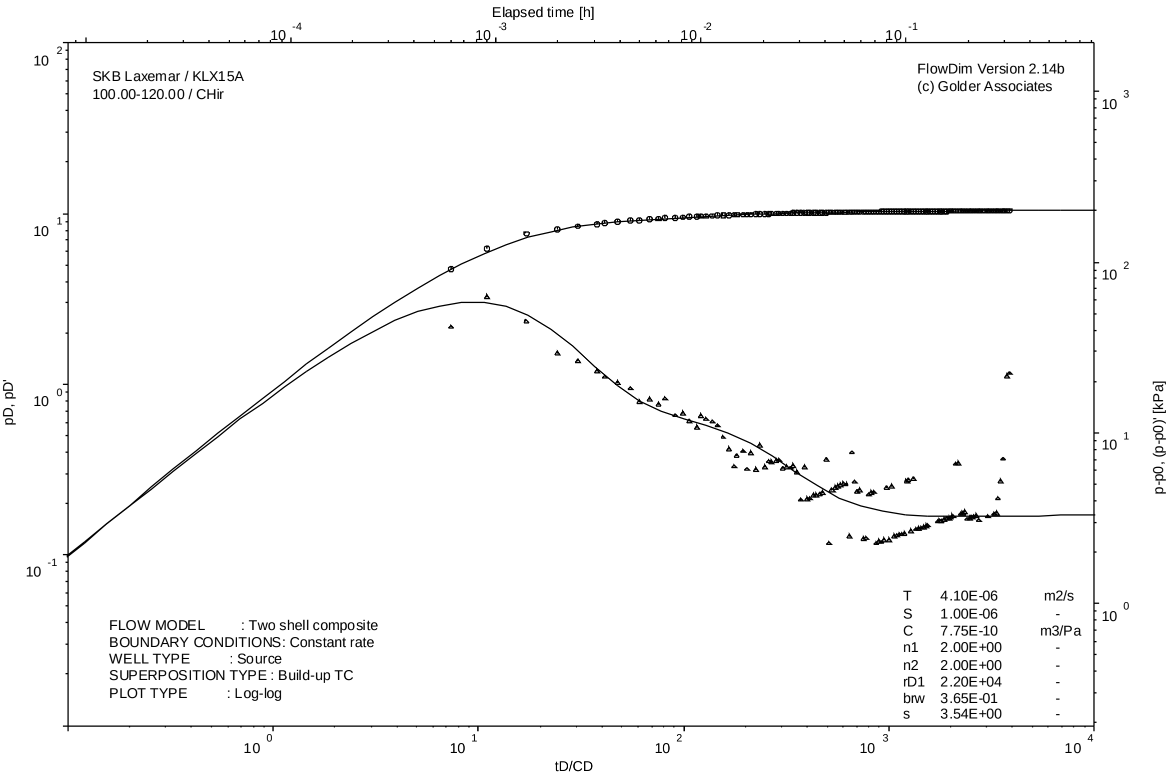
Pressure and flow rate vs. time; cartesian plot



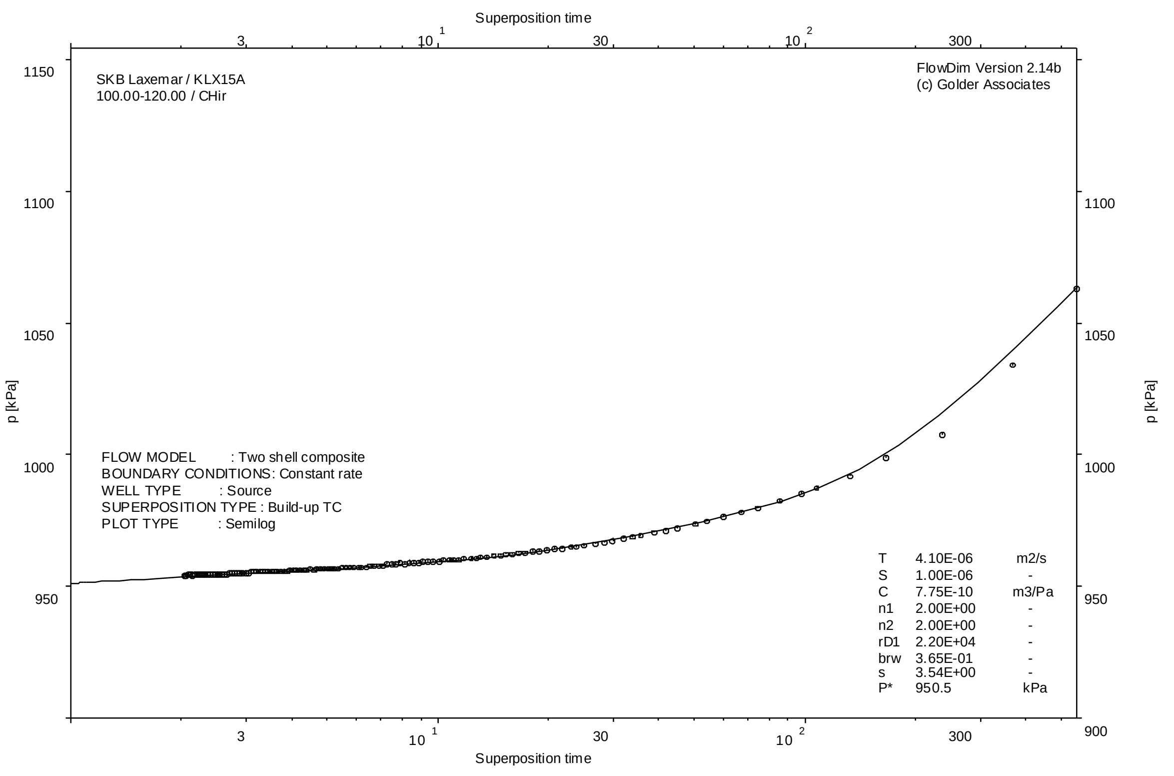
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

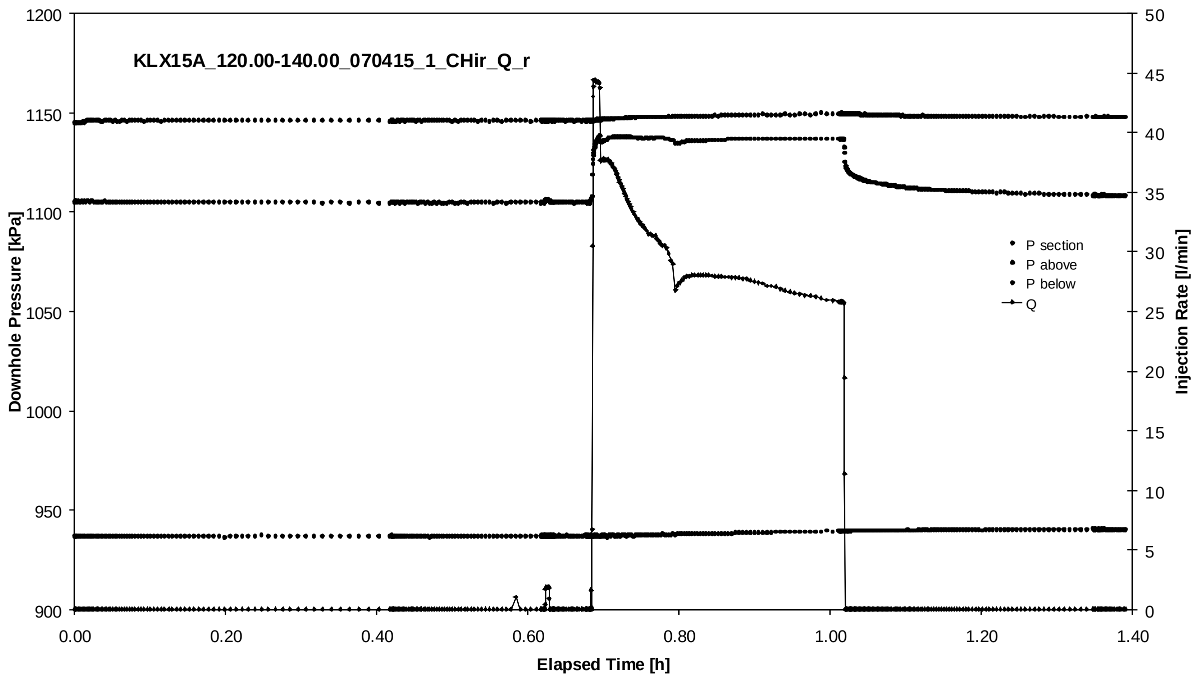


CHIR phase; HORNER match

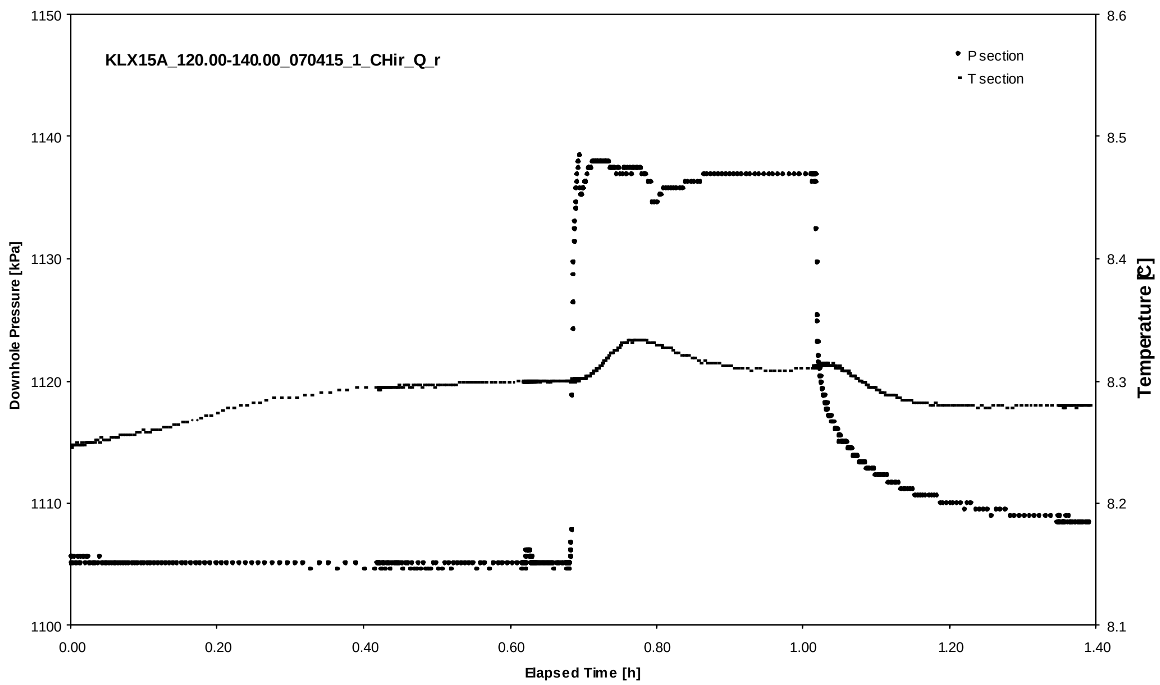
APPENDIX 2-11

Test 120.00 – 140.00 m

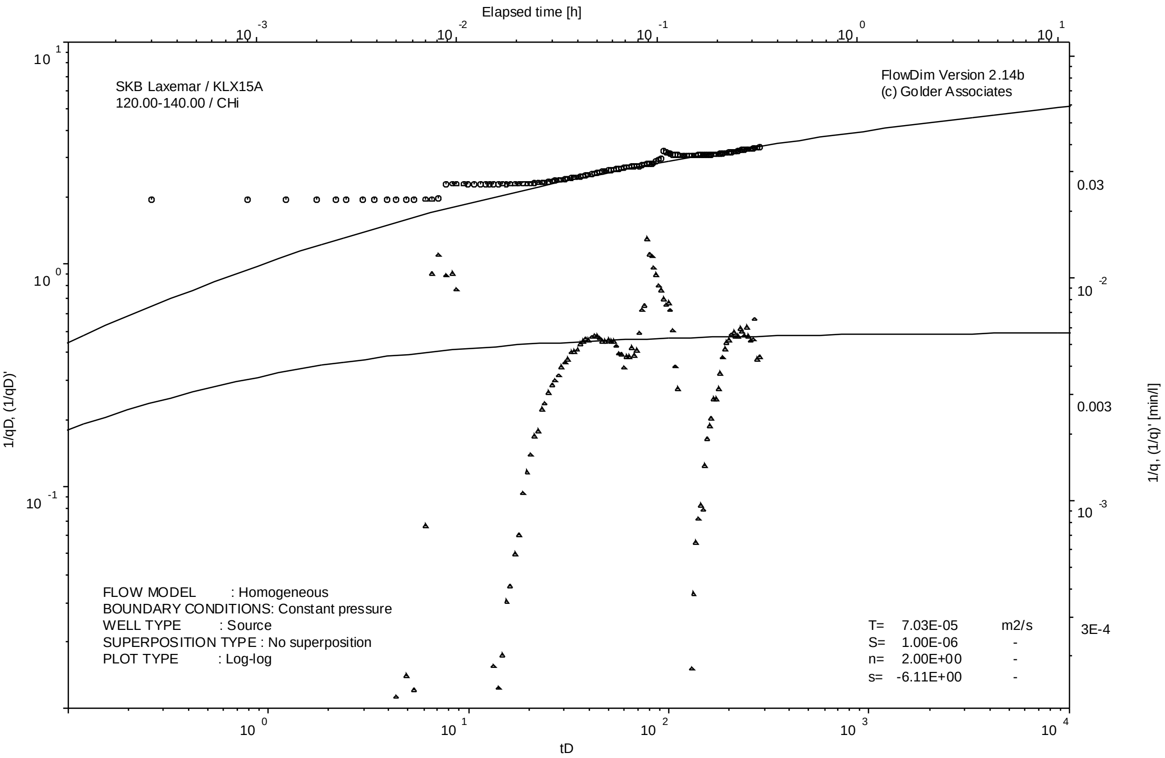
Analysis diagrams



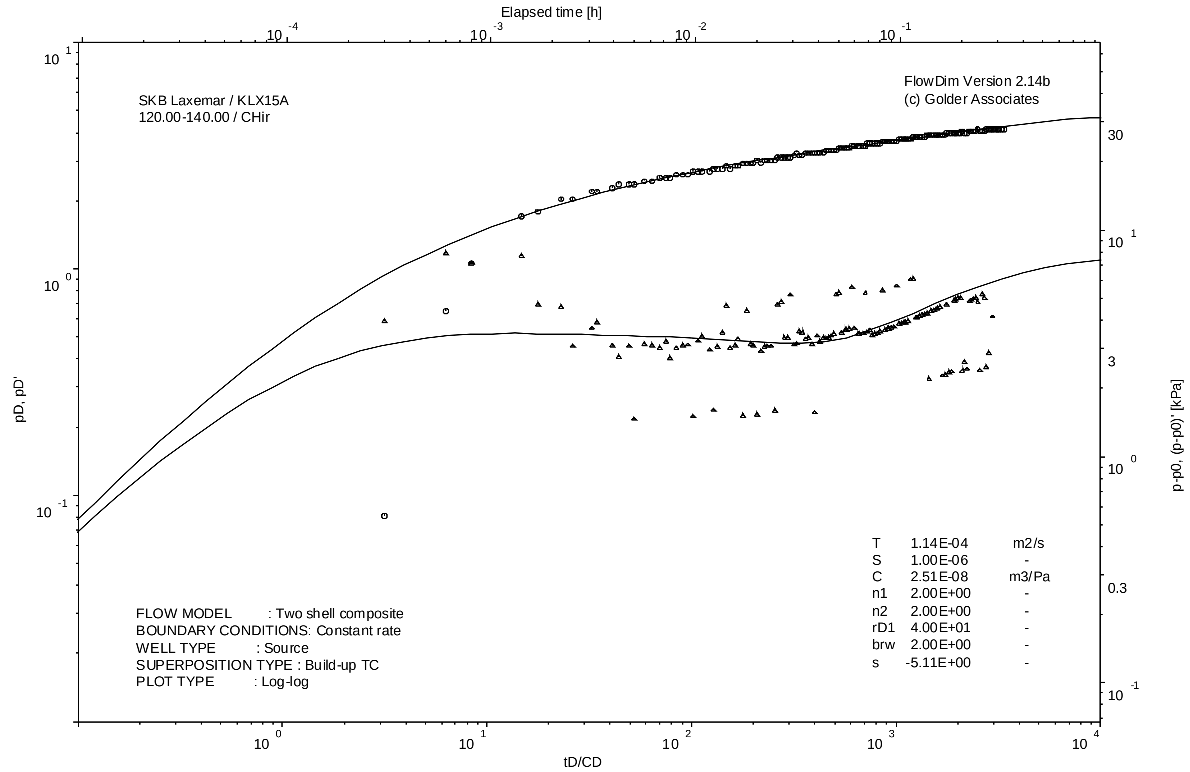
Pressure and flow rate vs. time; cartesian plot



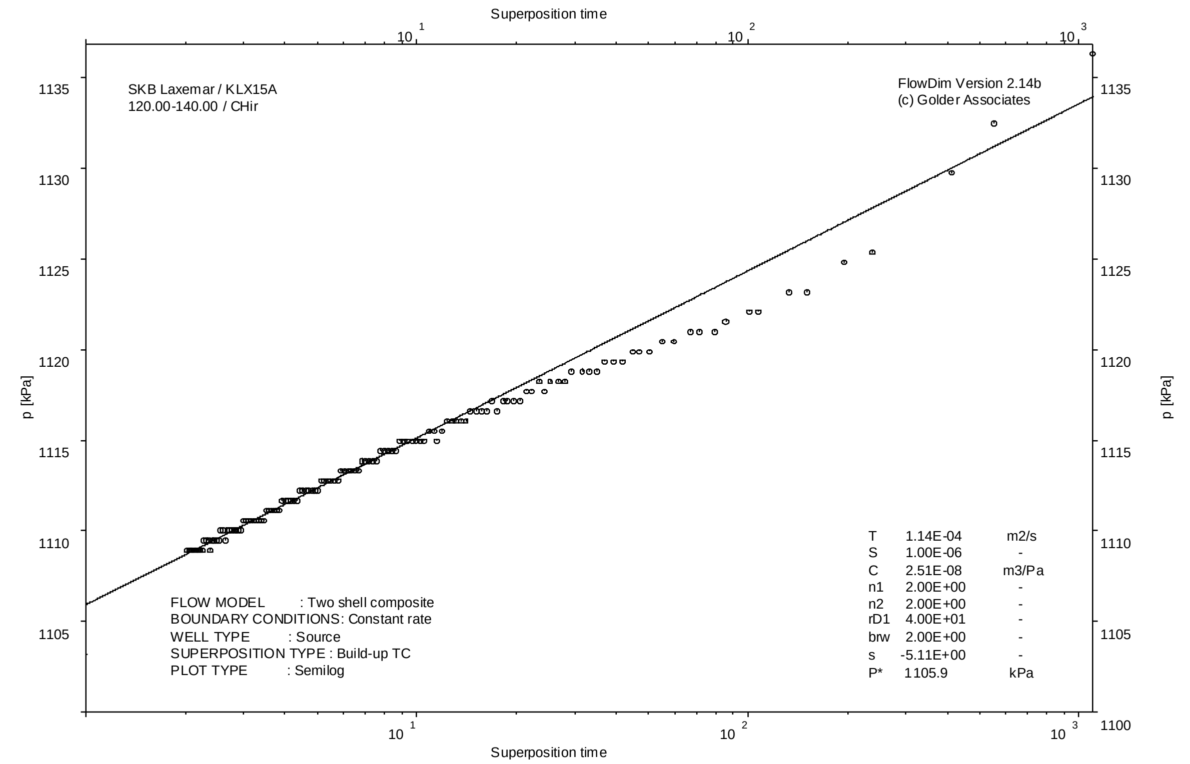
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

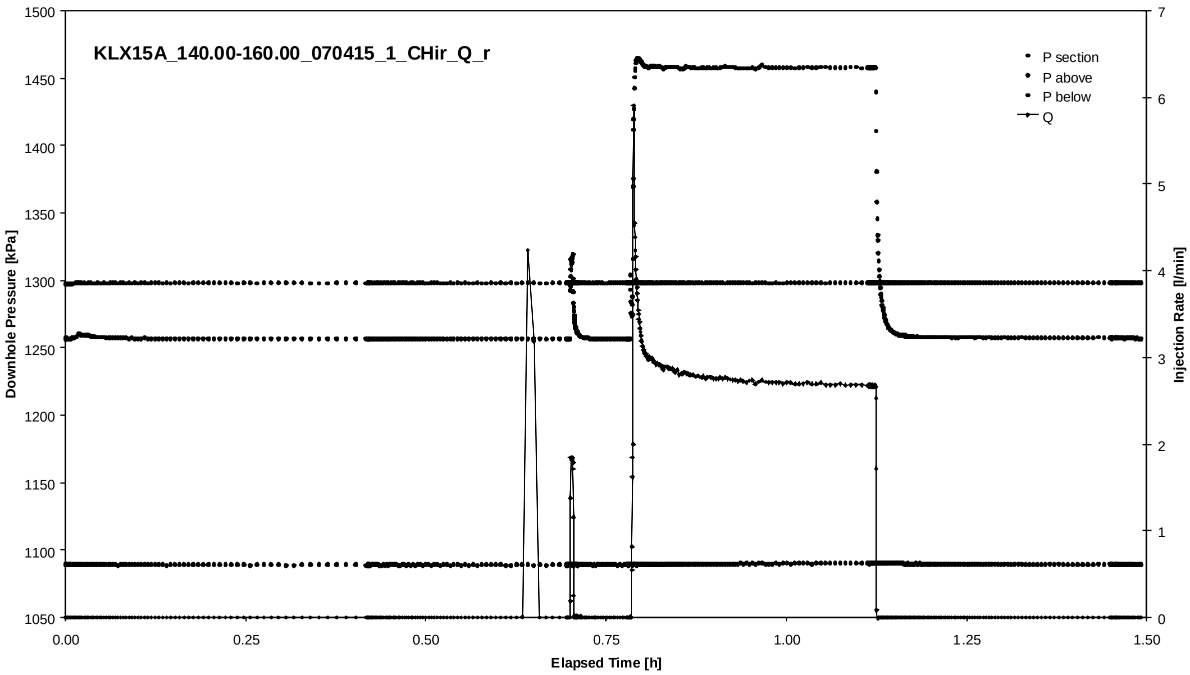


CHIR phase; HORNER match

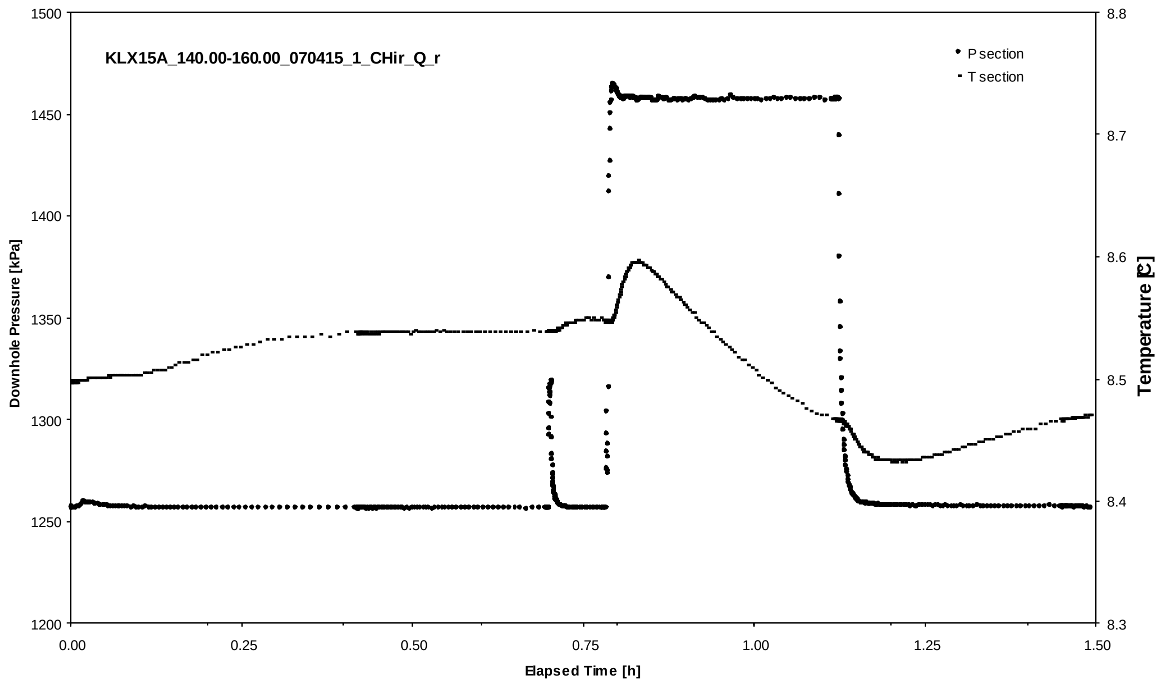
APPENDIX 2-12

Test 140.00 – 160.00 m

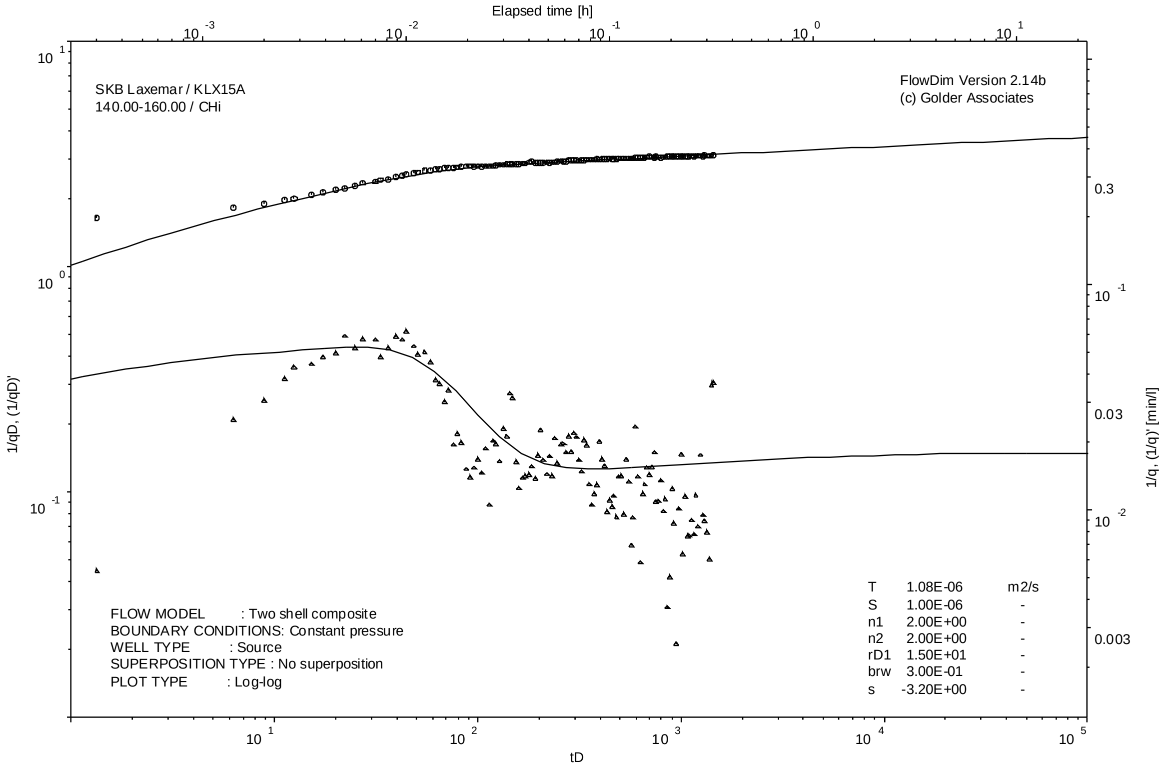
Analysis diagrams



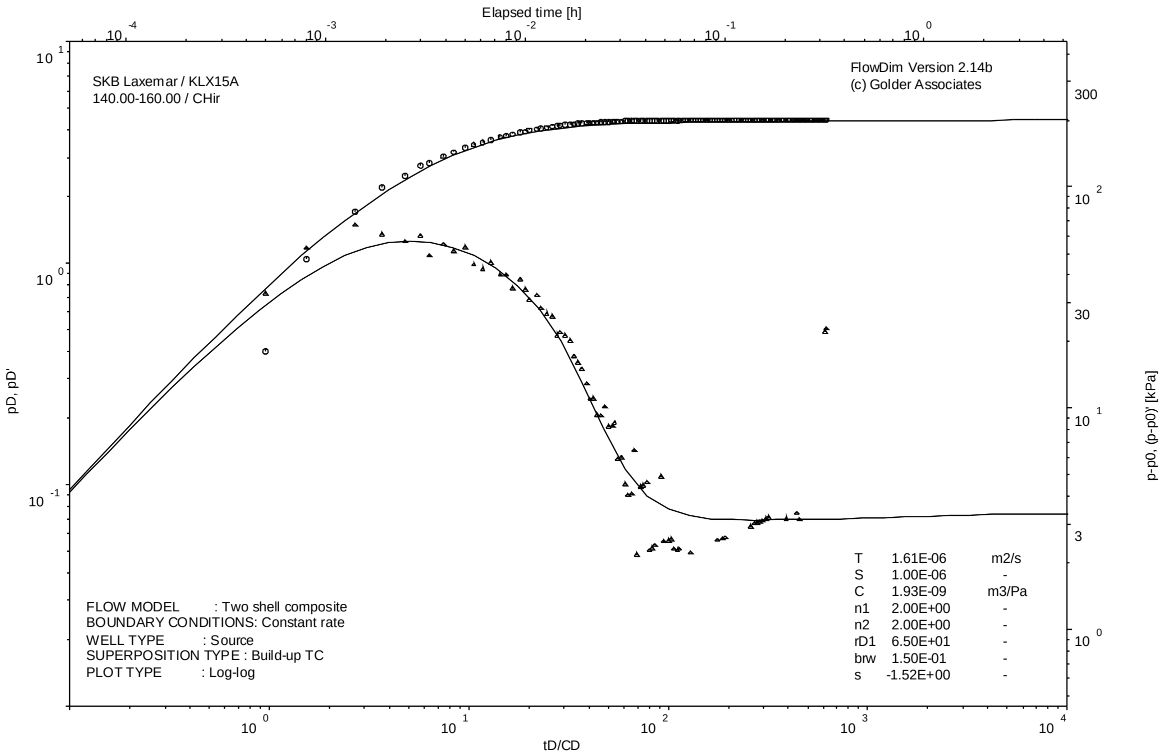
Pressure and flow rate vs. time; cartesian plot



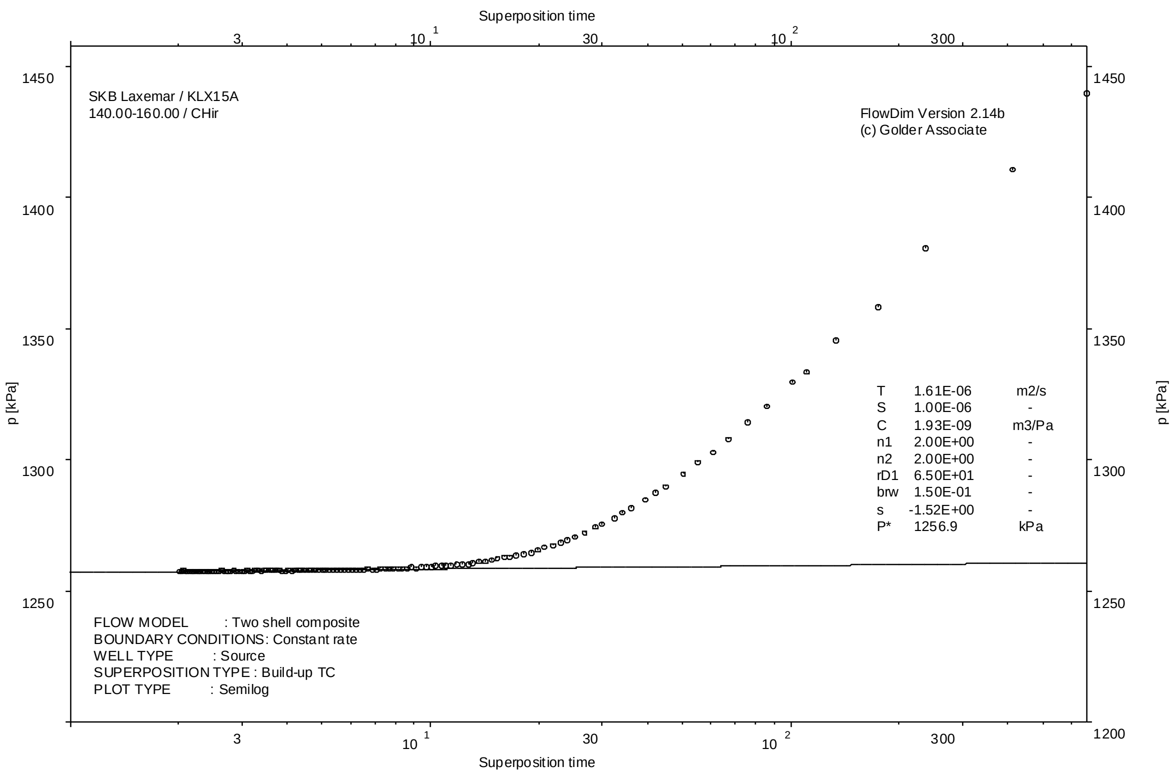
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

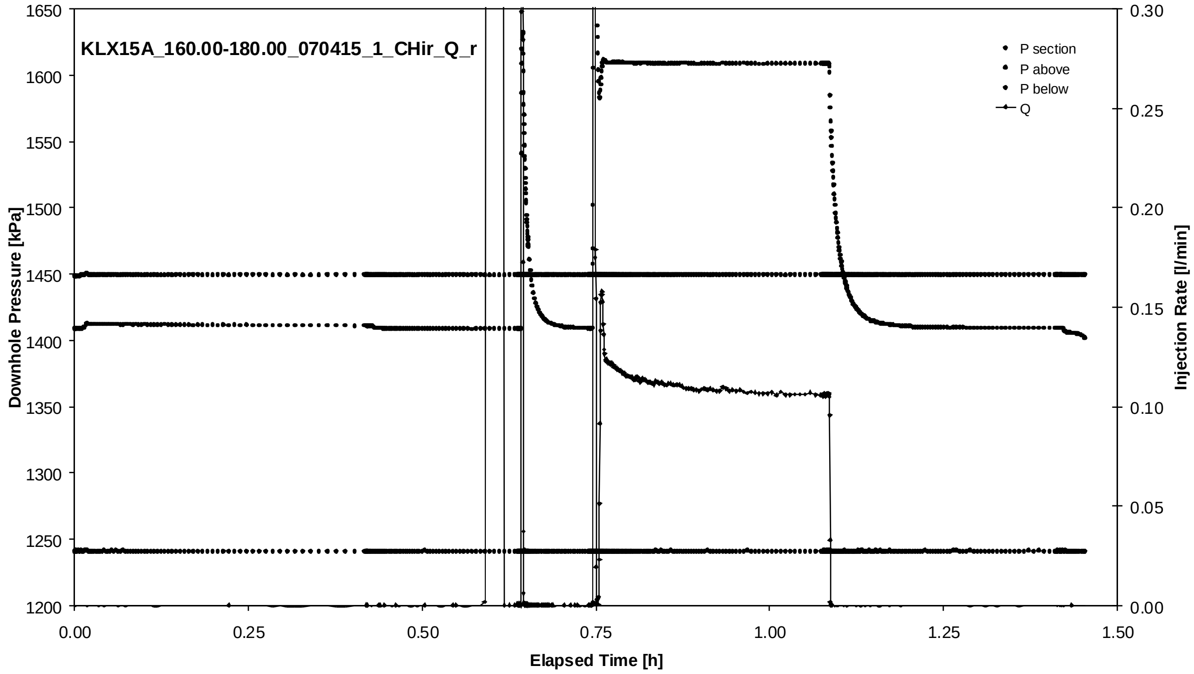


CHIR phase; HORNER match

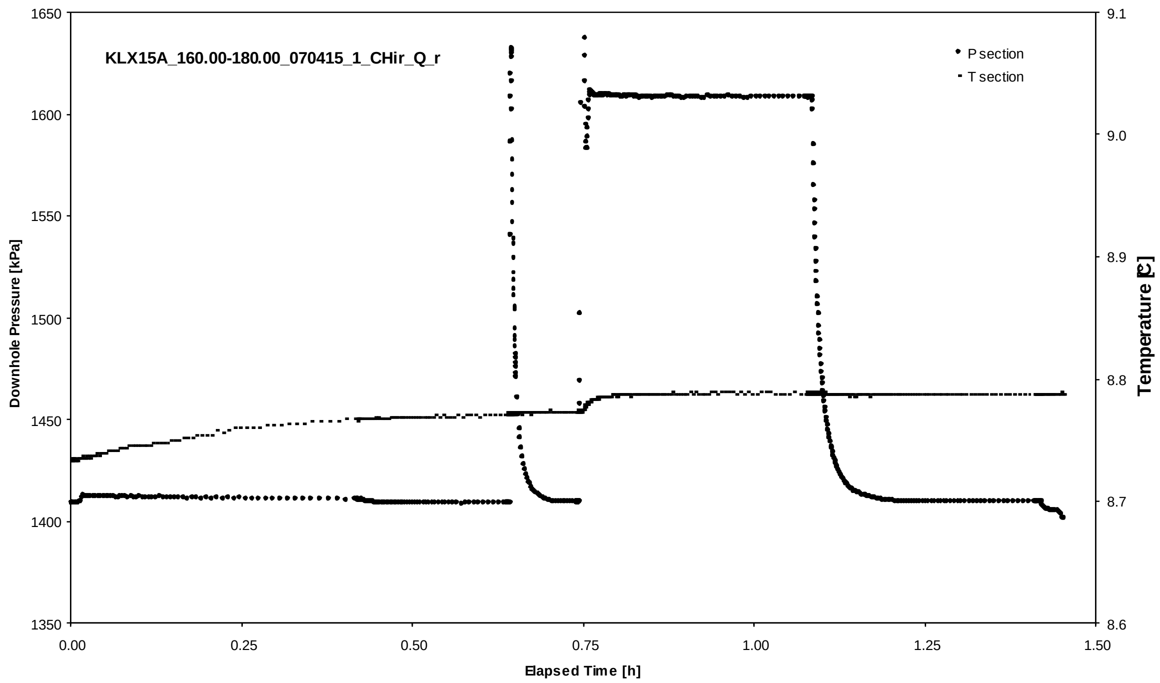
APPENDIX 2-13

Test 160.00 – 180.00 m

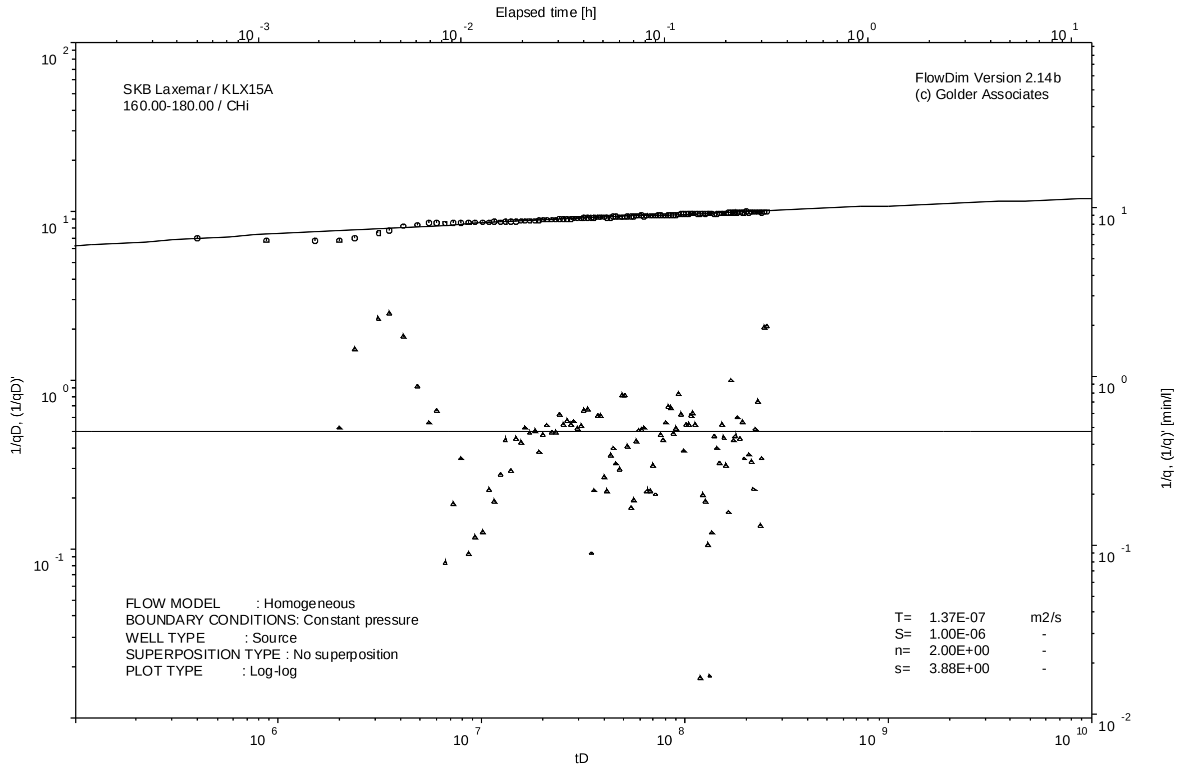
Analysis diagrams



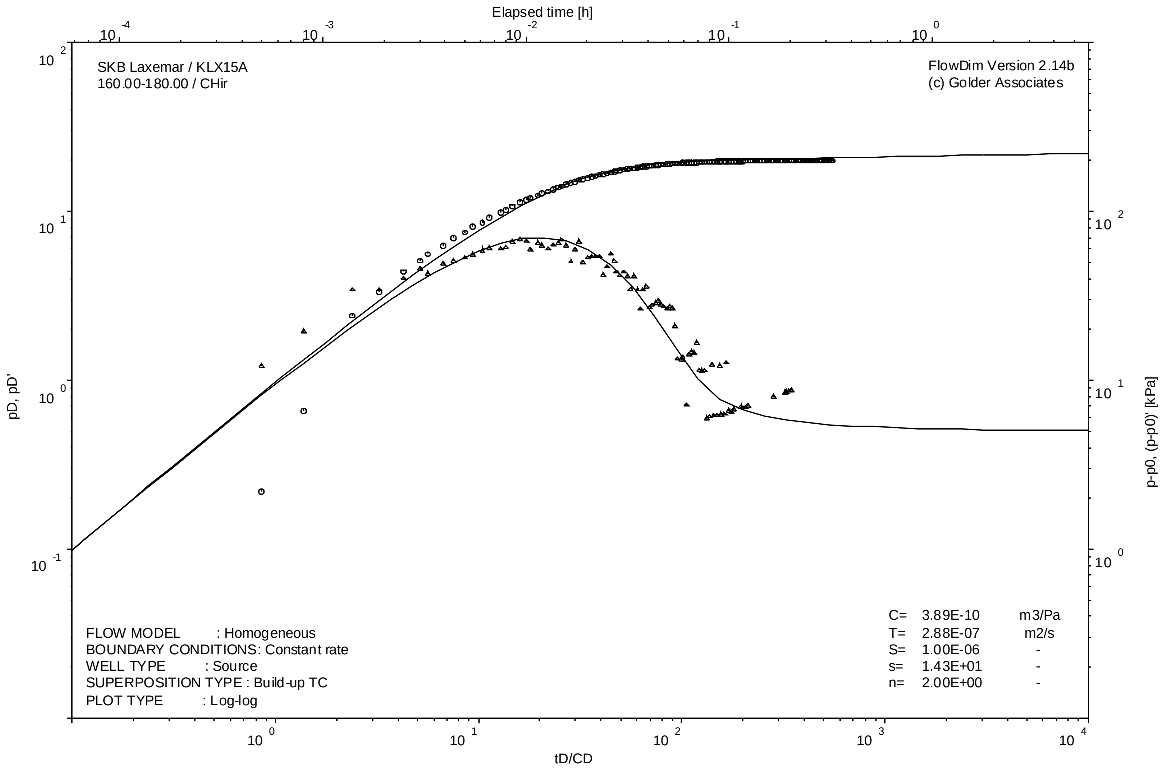
Pressure and flow rate vs. time; cartesian plot



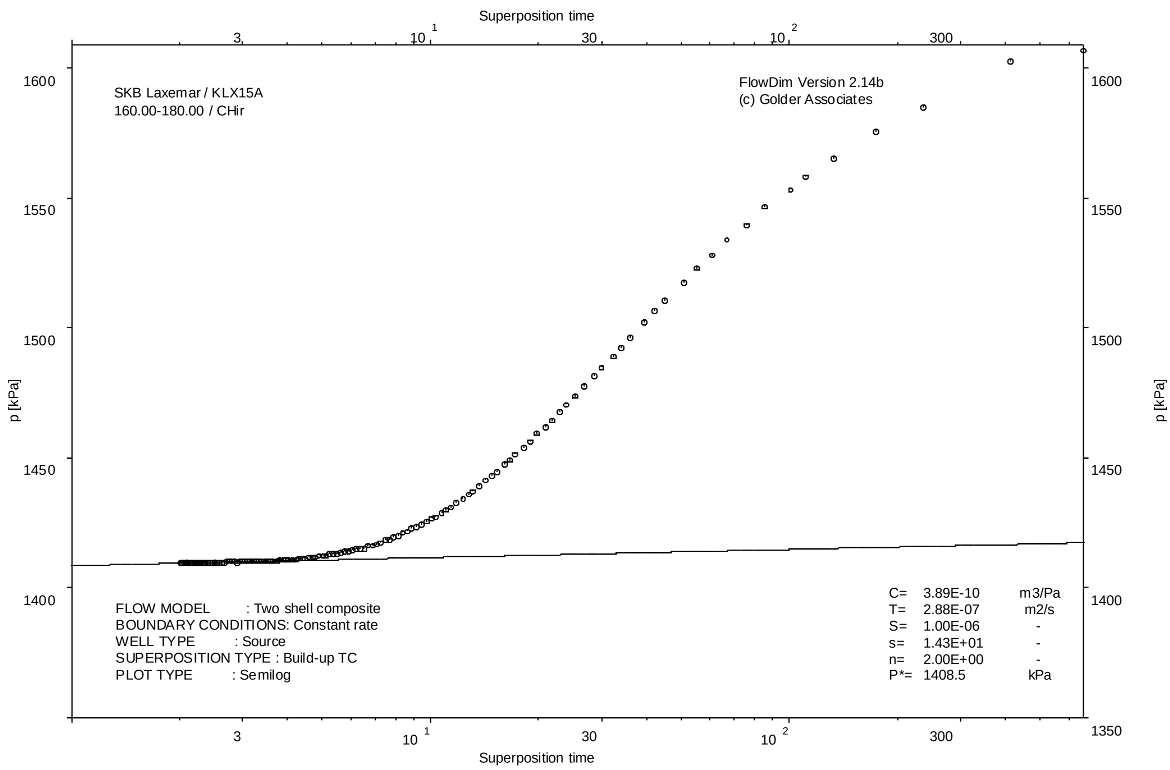
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

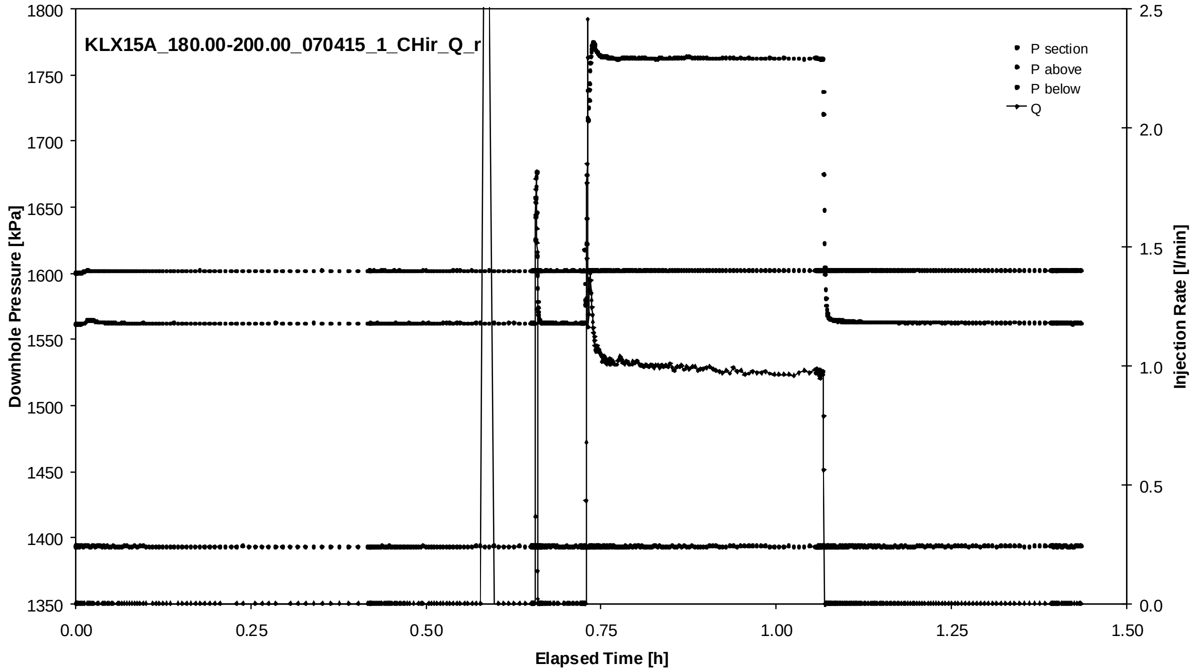


CHIR phase; HORNER match

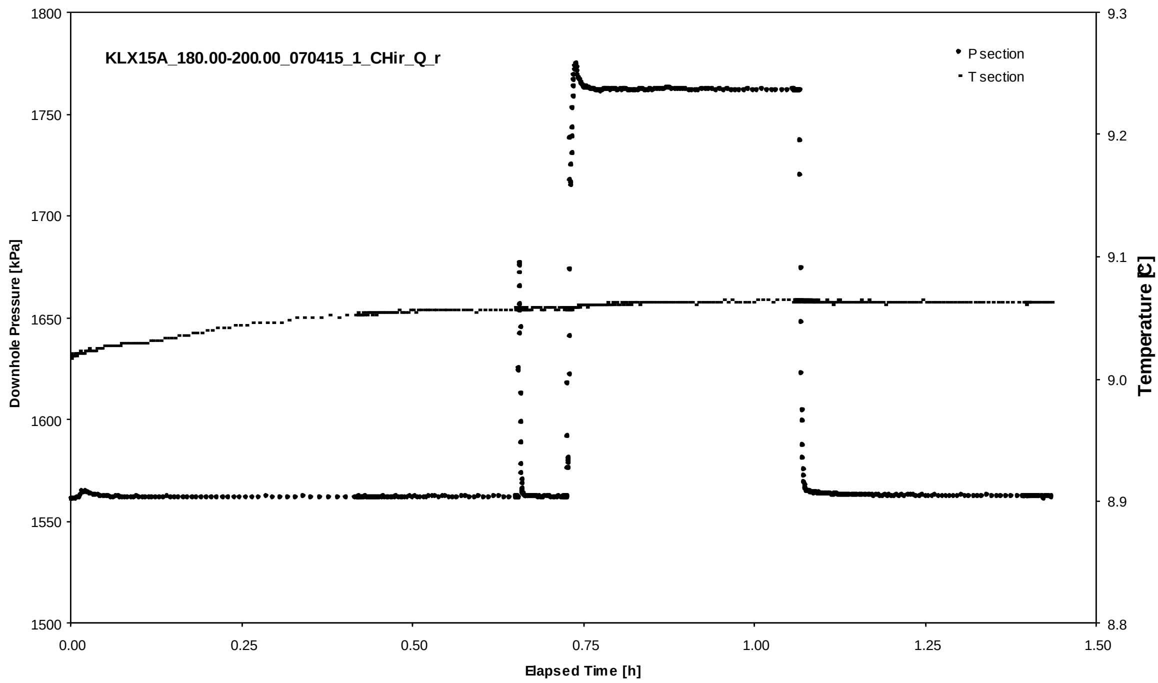
APPENDIX 2-14

Test 180.00 – 200.00 m

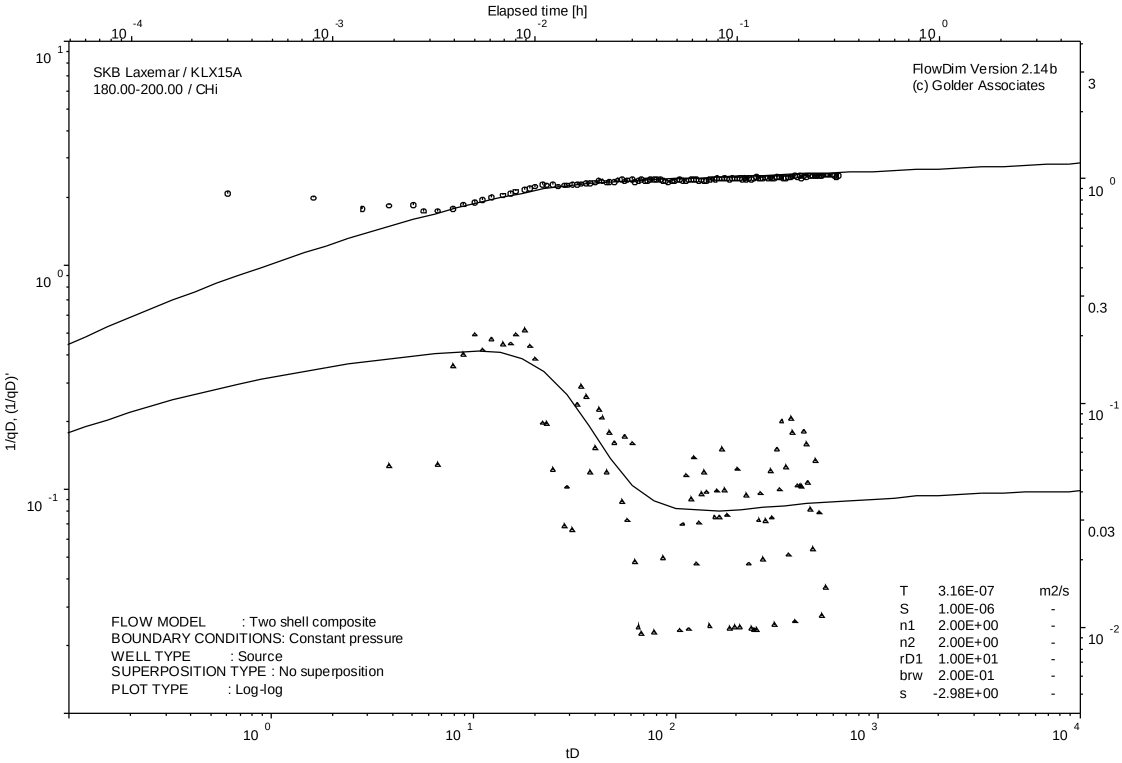
Analysis diagrams



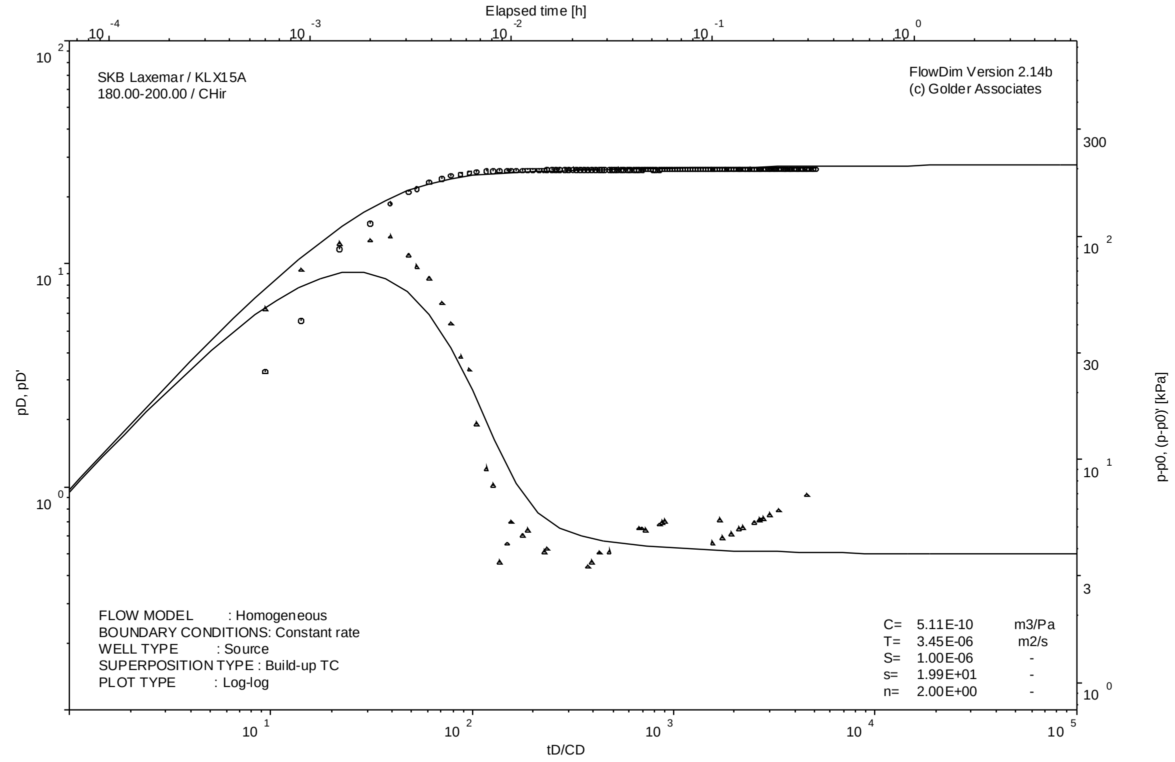
Pressure and flow rate vs. time; cartesian plot



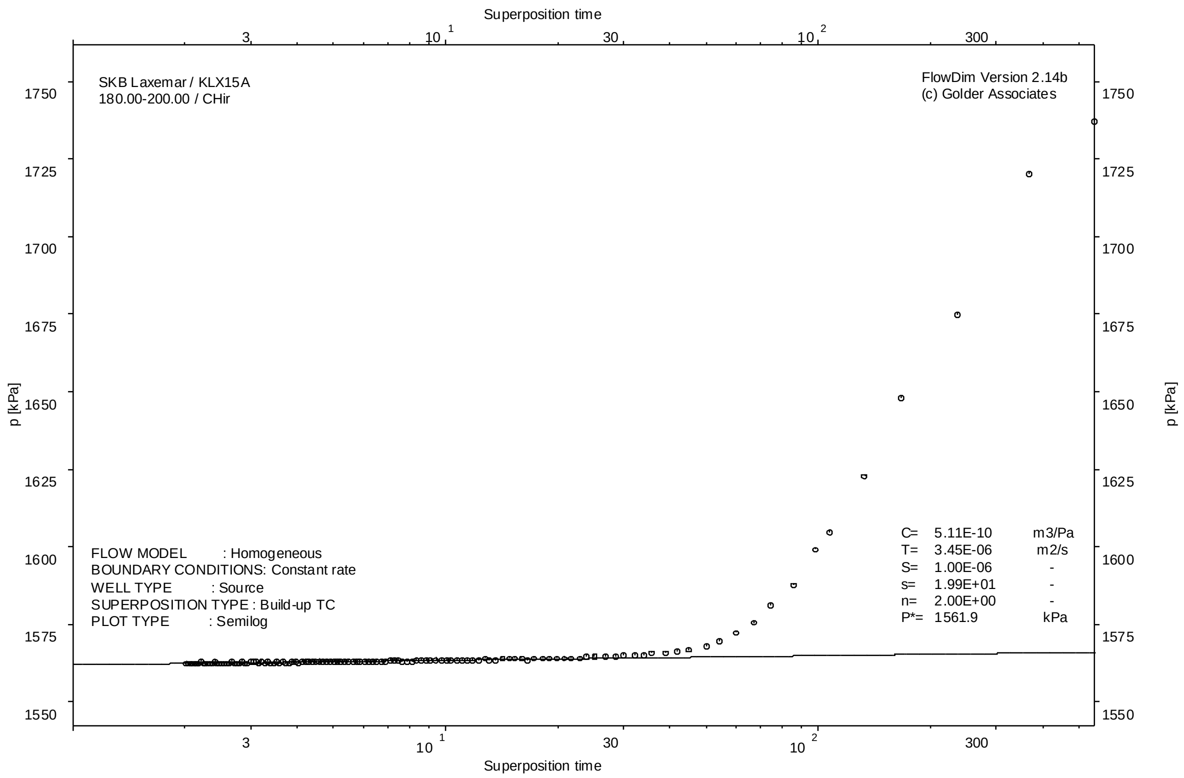
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

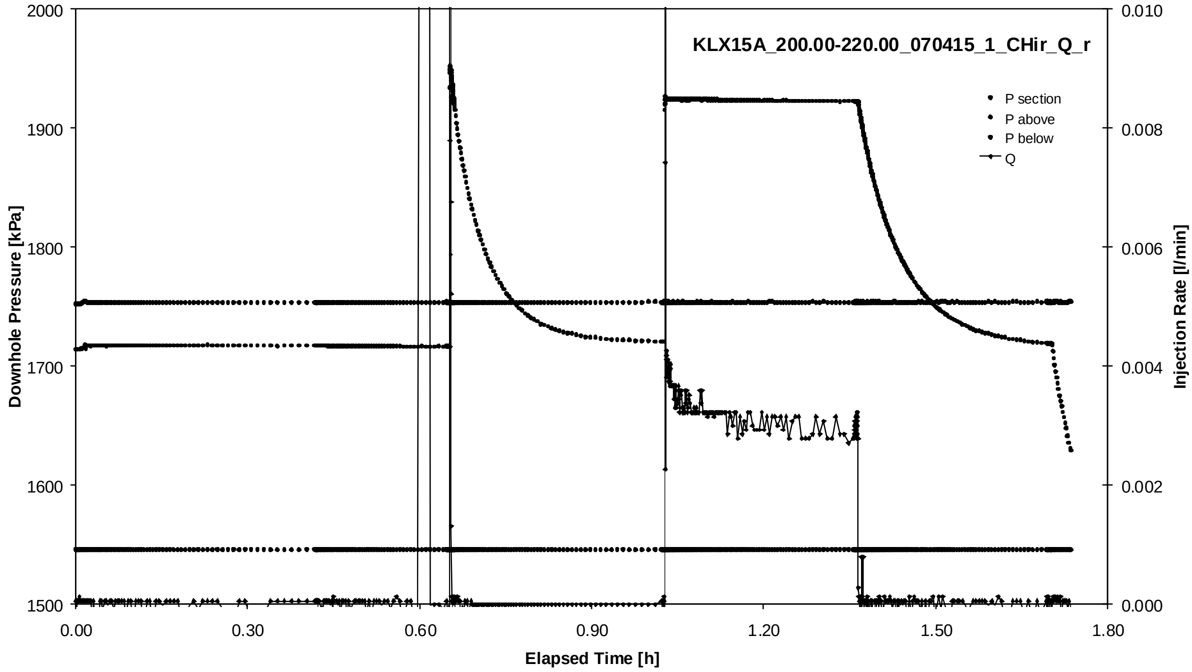


CHIR phase; HORNER match

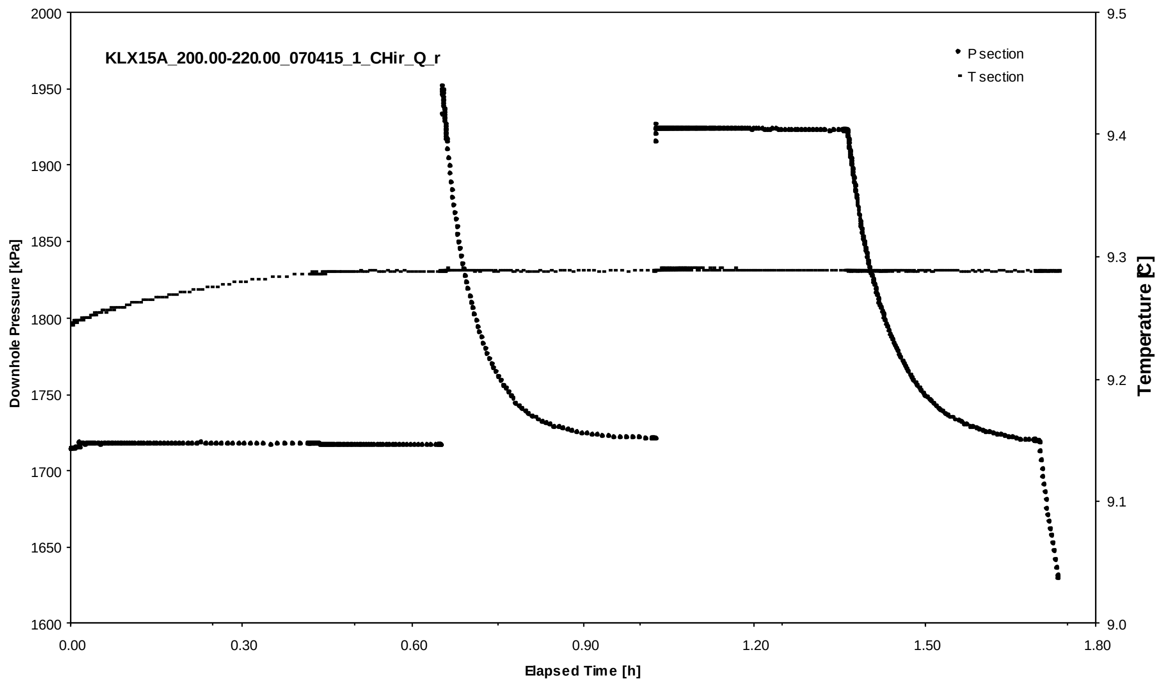
APPENDIX 2-15

Test 200.00 – 220.00 m

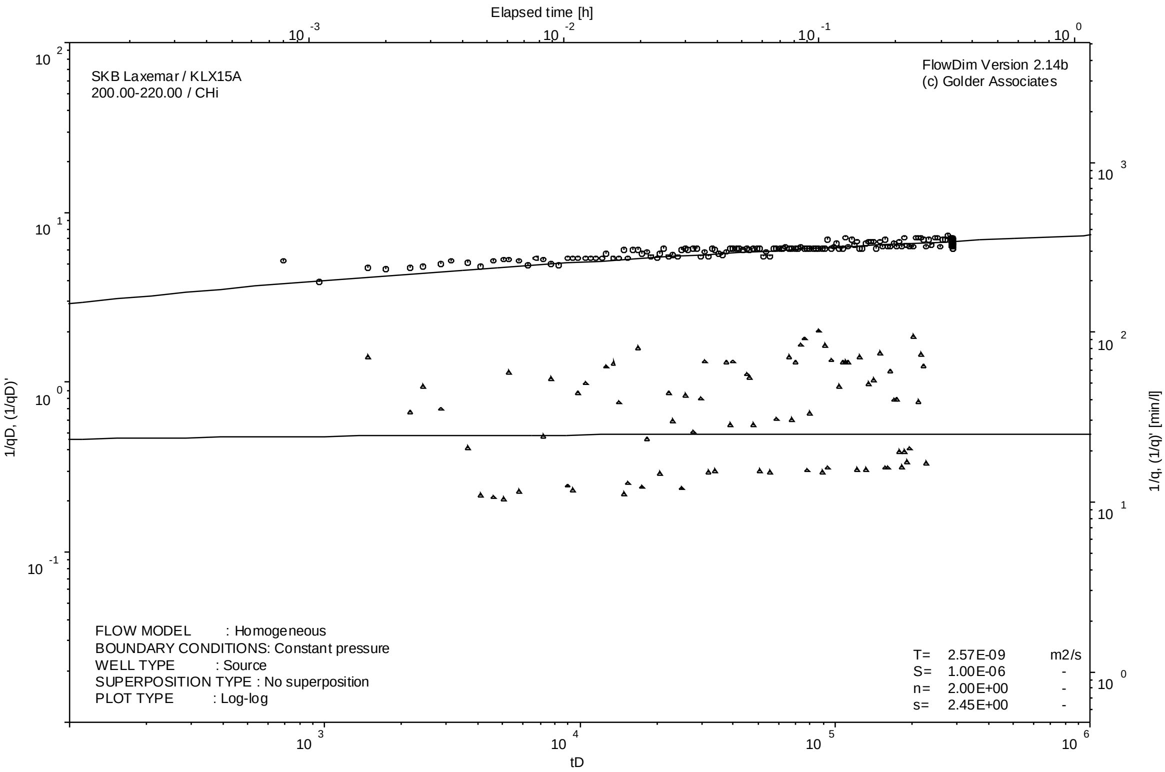
Analysis diagrams



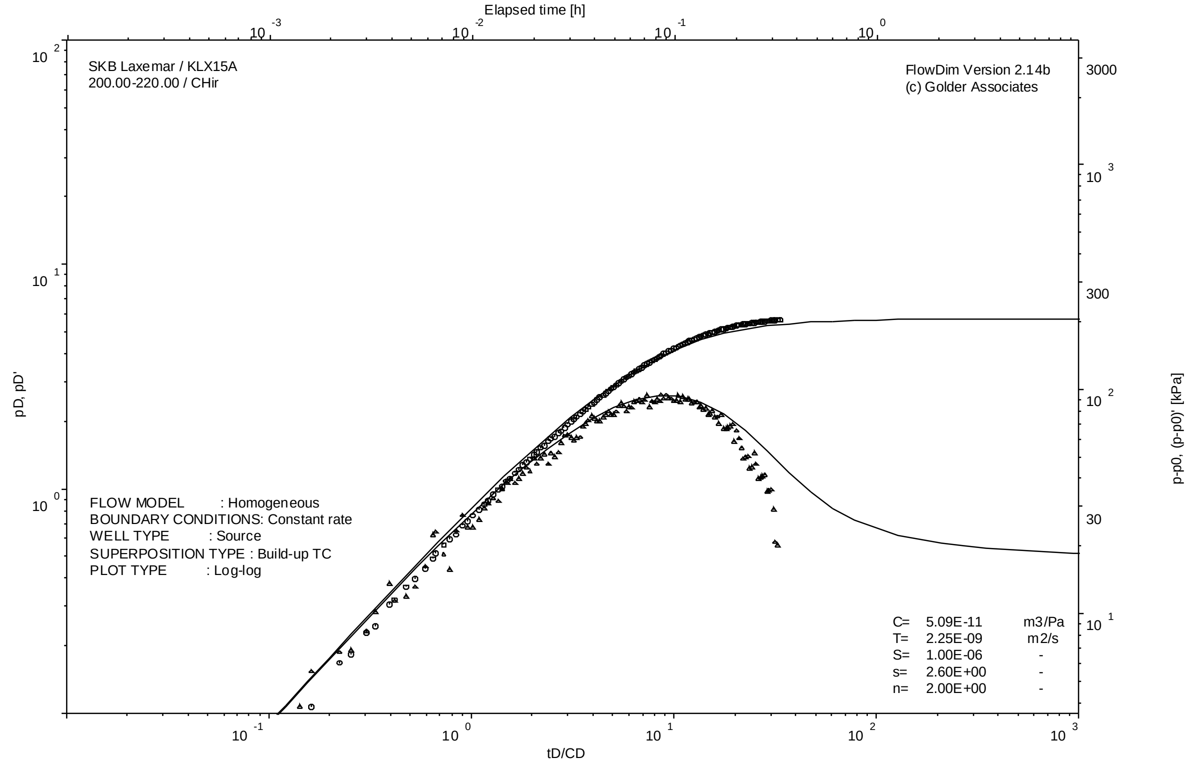
Pressure and flow rate vs. time; cartesian plot



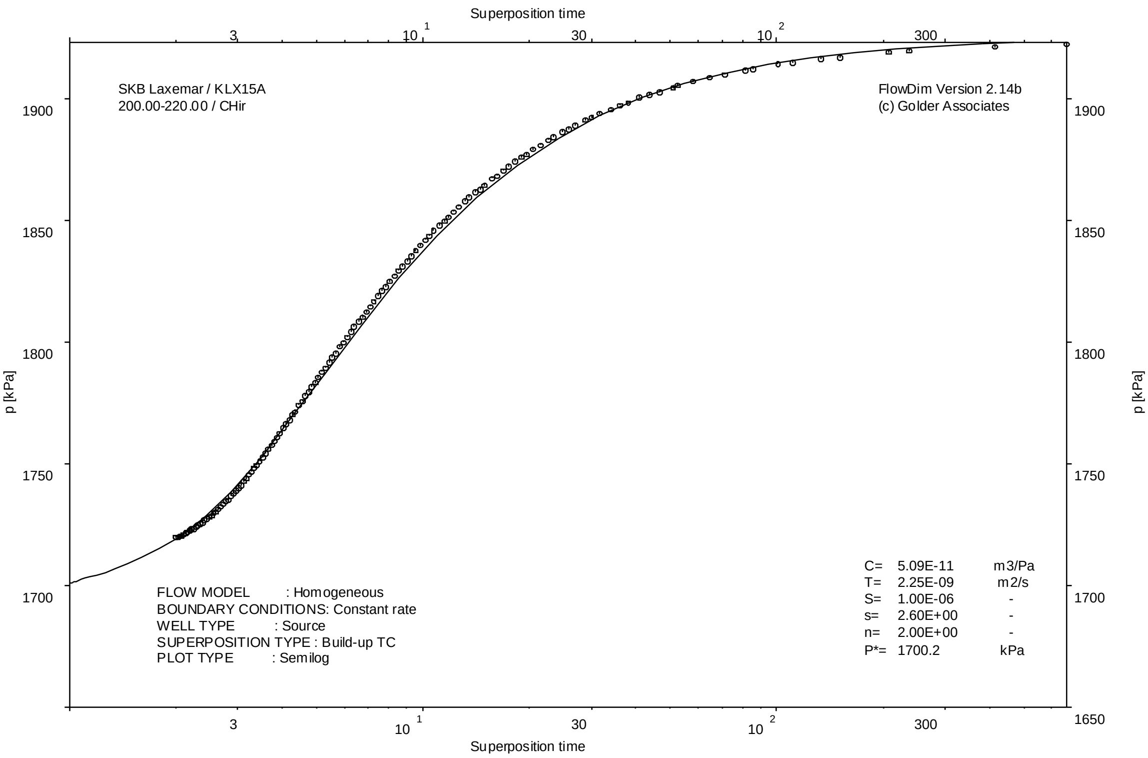
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

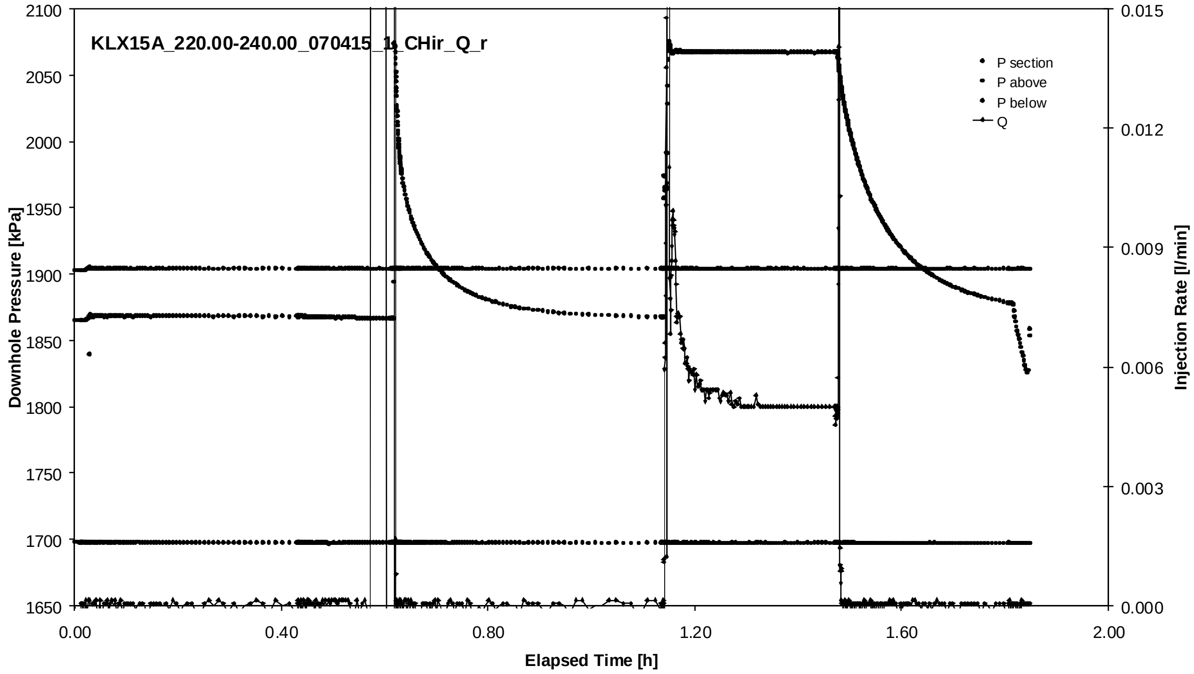


CHIR phase; HORNER match

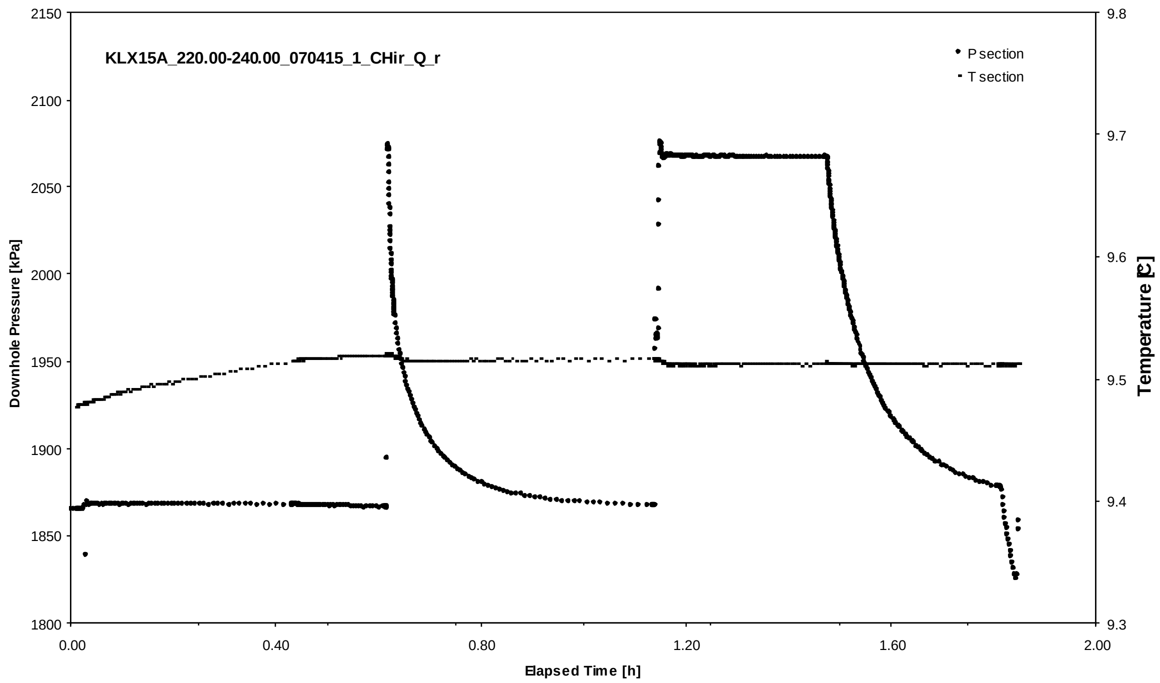
APPENDIX 2-16

Test 220.00 – 240.00 m

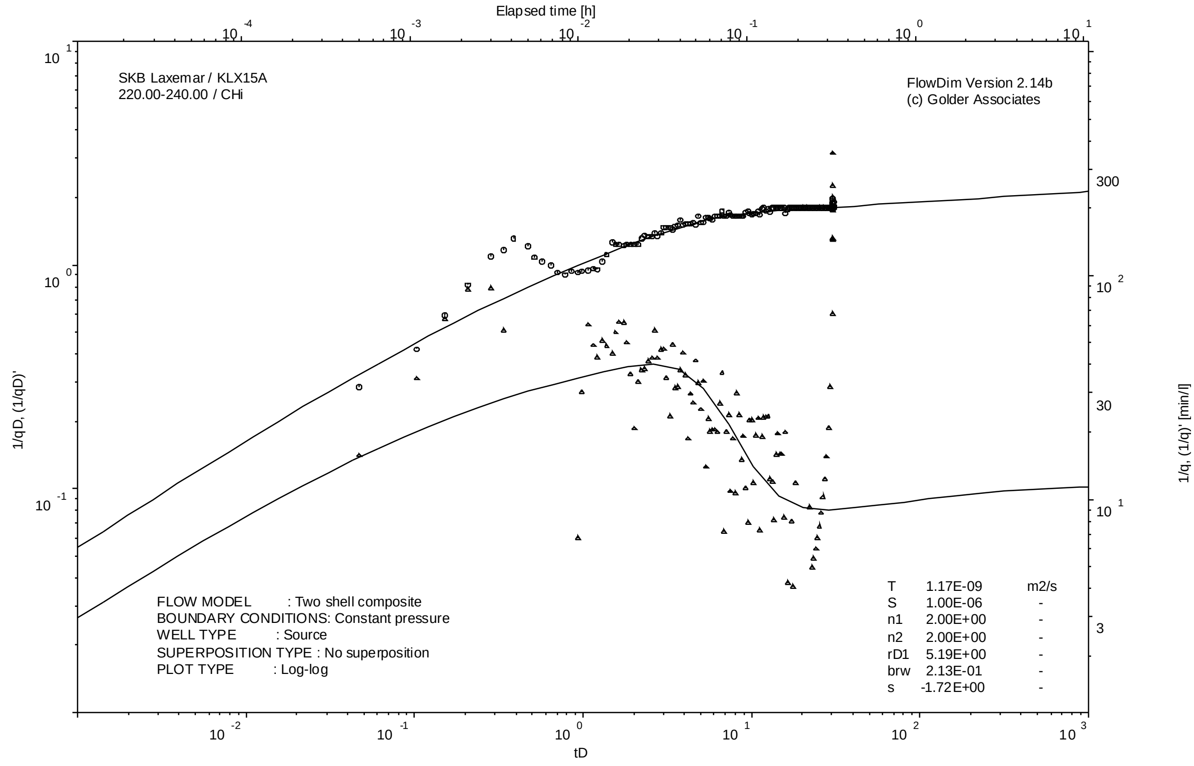
Analysis diagrams



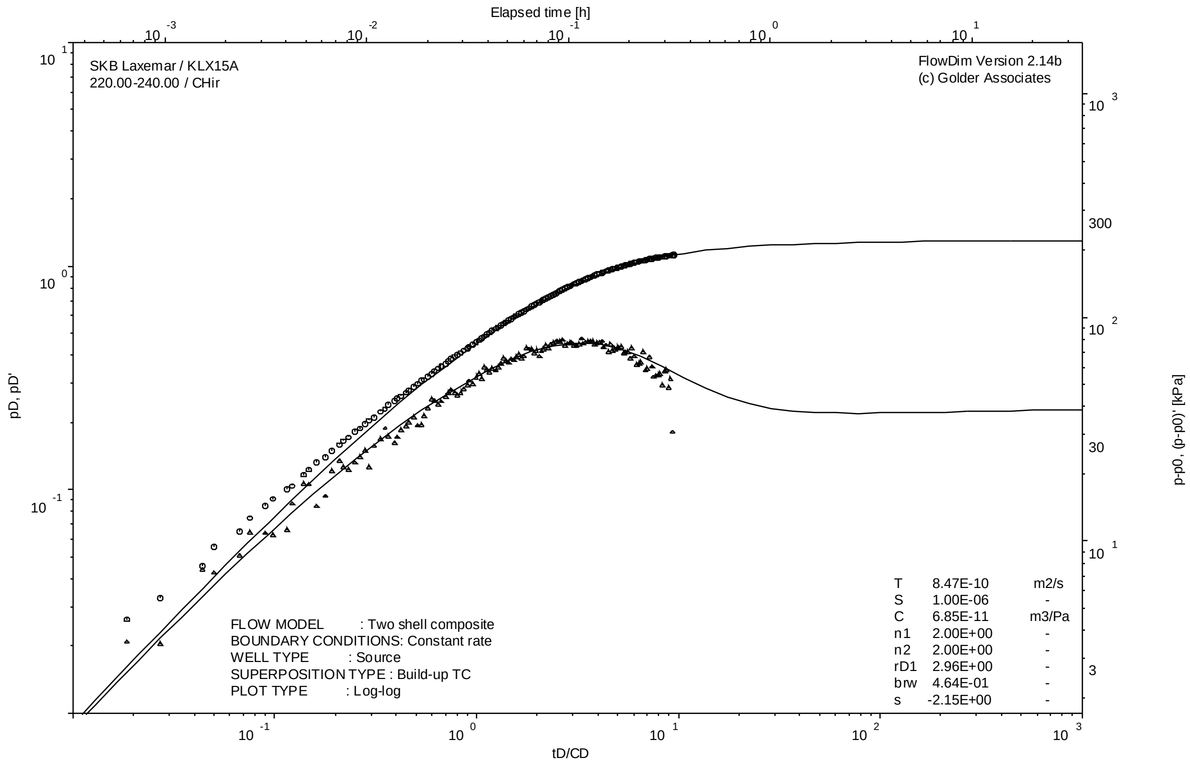
Pressure and flow rate vs. time; cartesian plot



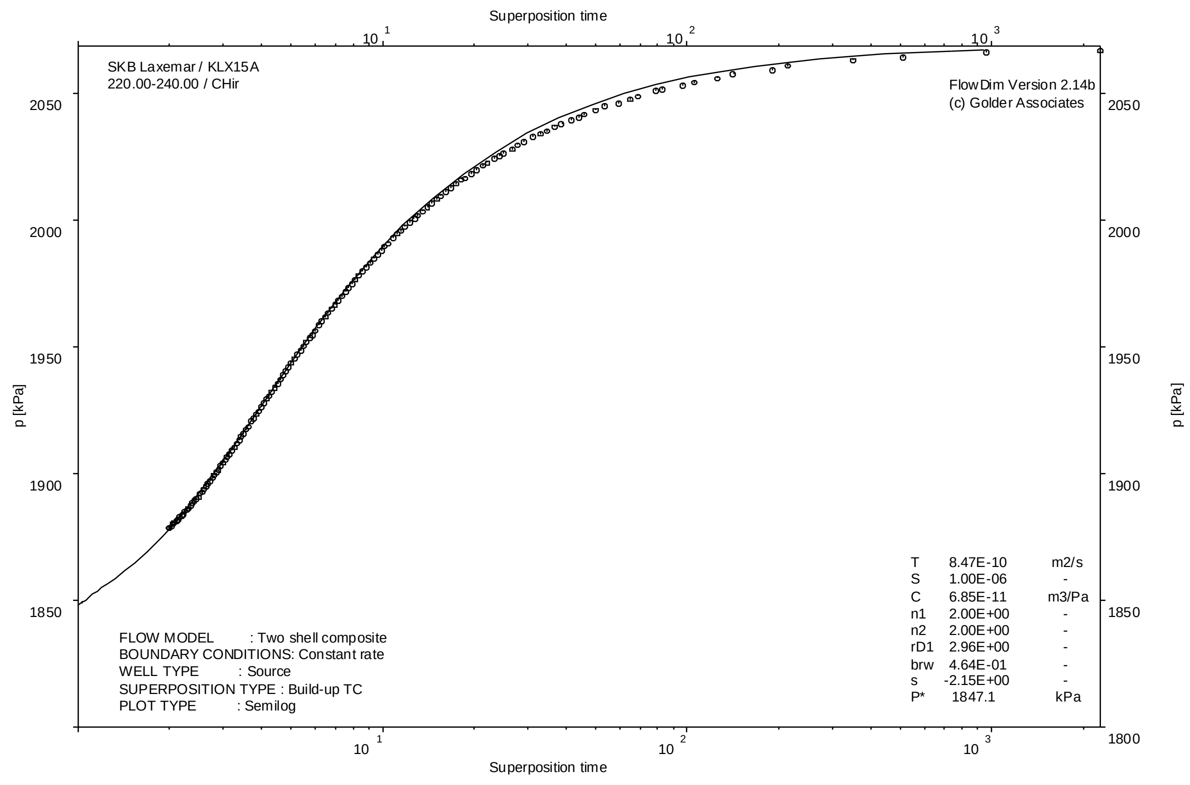
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

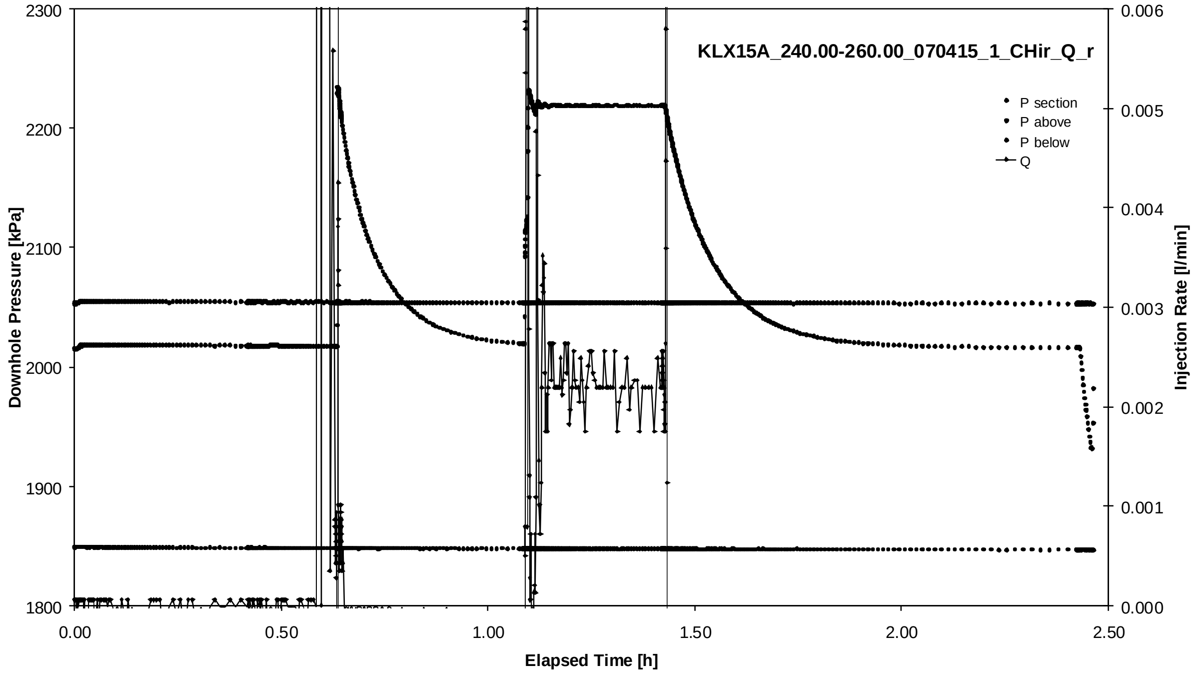


CHIR phase; HORNER match

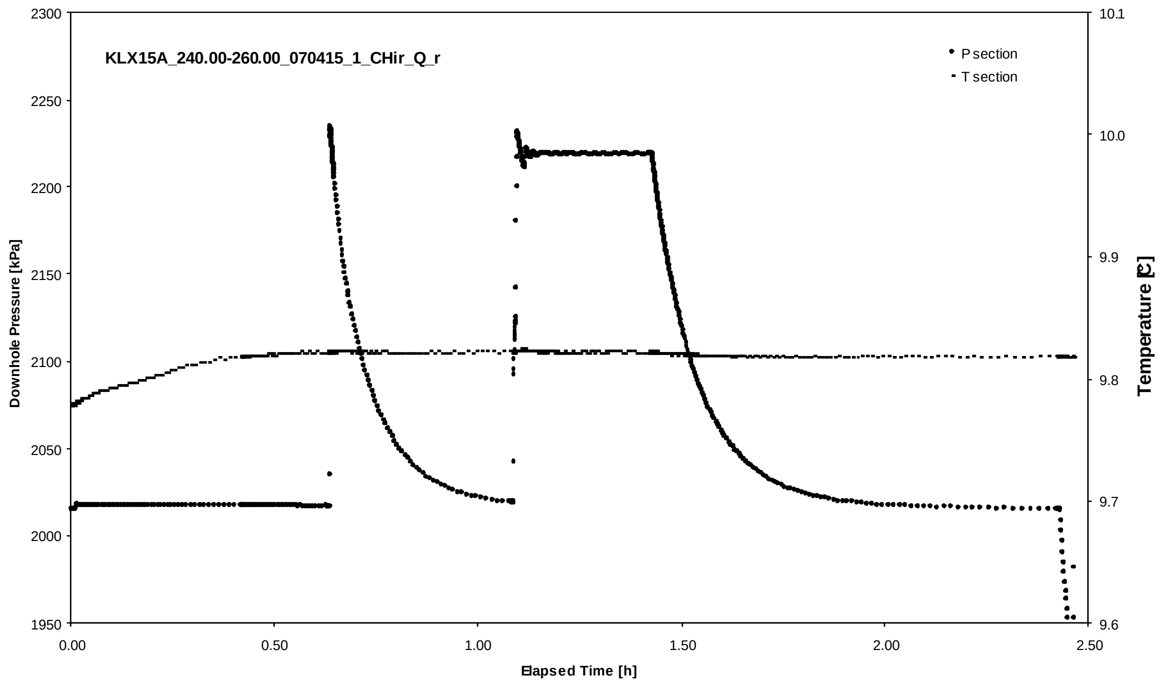
APPENDIX 2-17

Test 240.00 – 260.00 m

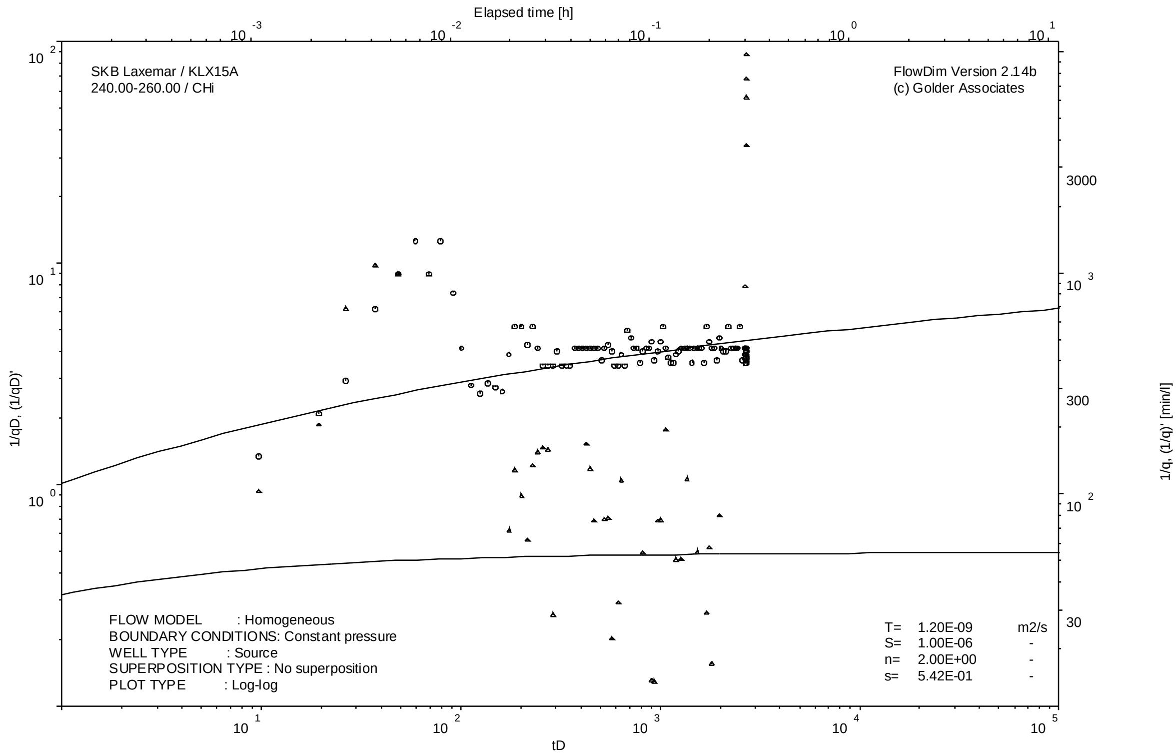
Analysis diagrams



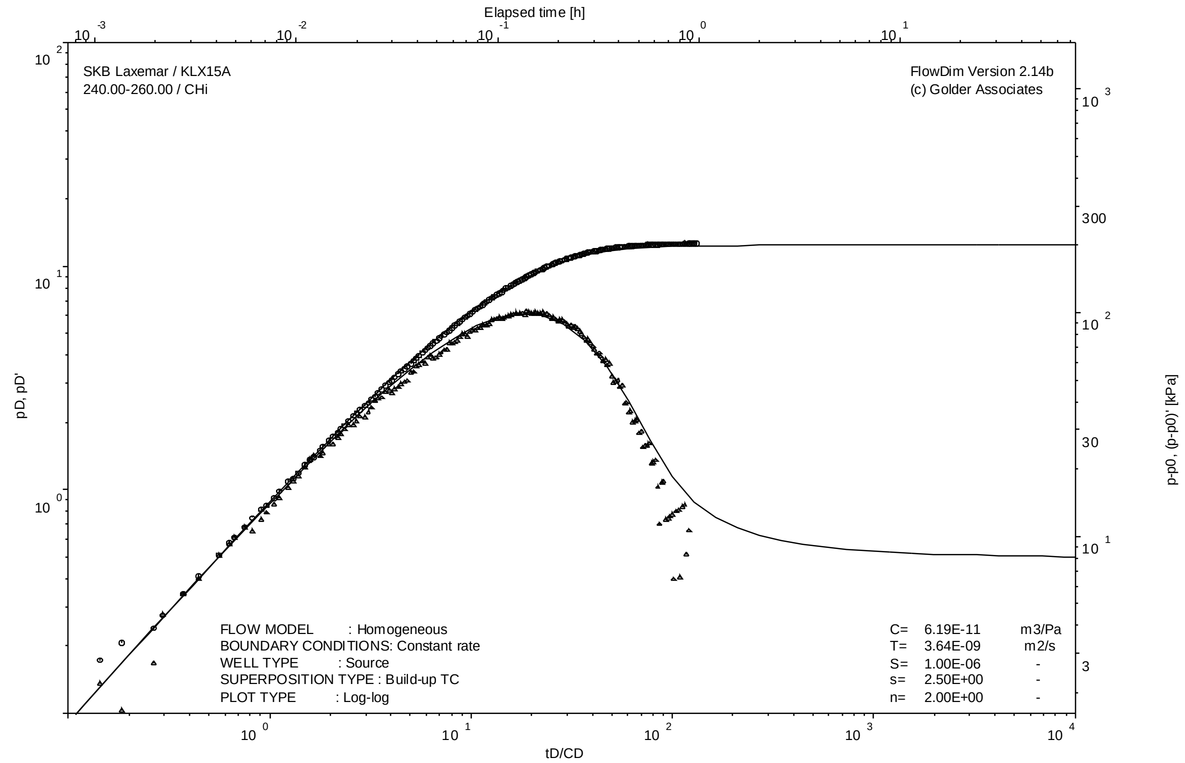
Pressure and flow rate vs. time; cartesian plot



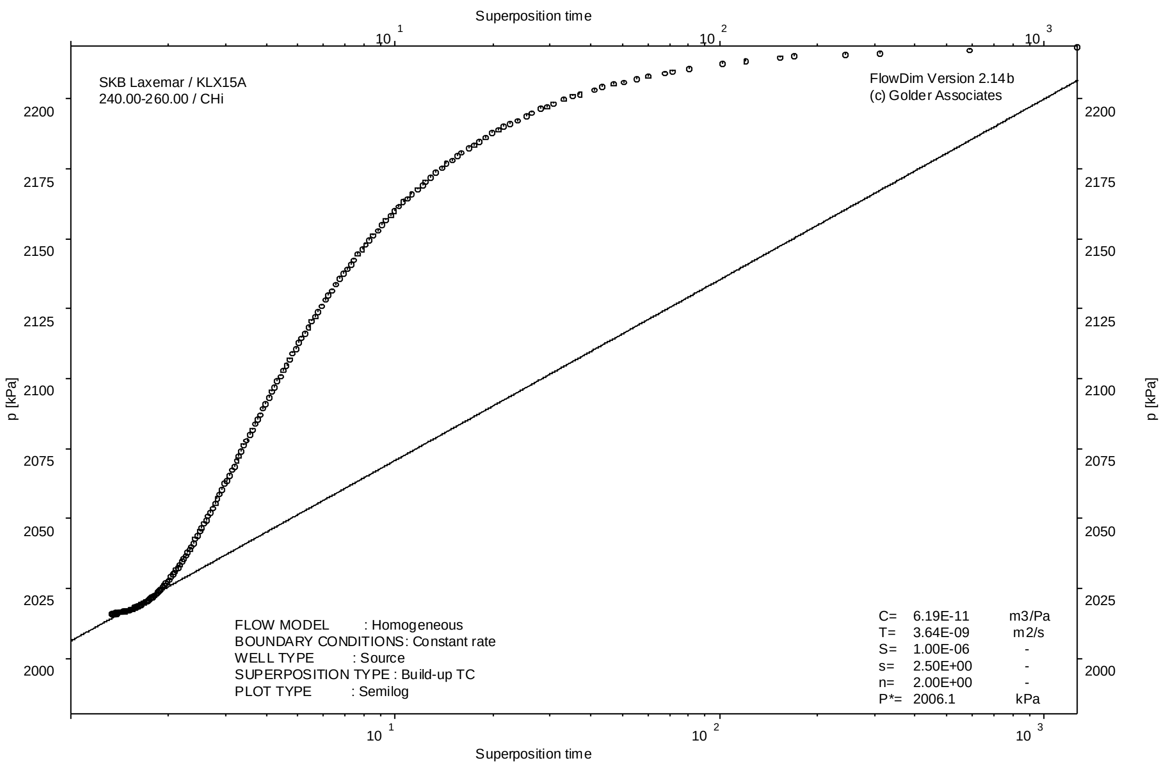
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

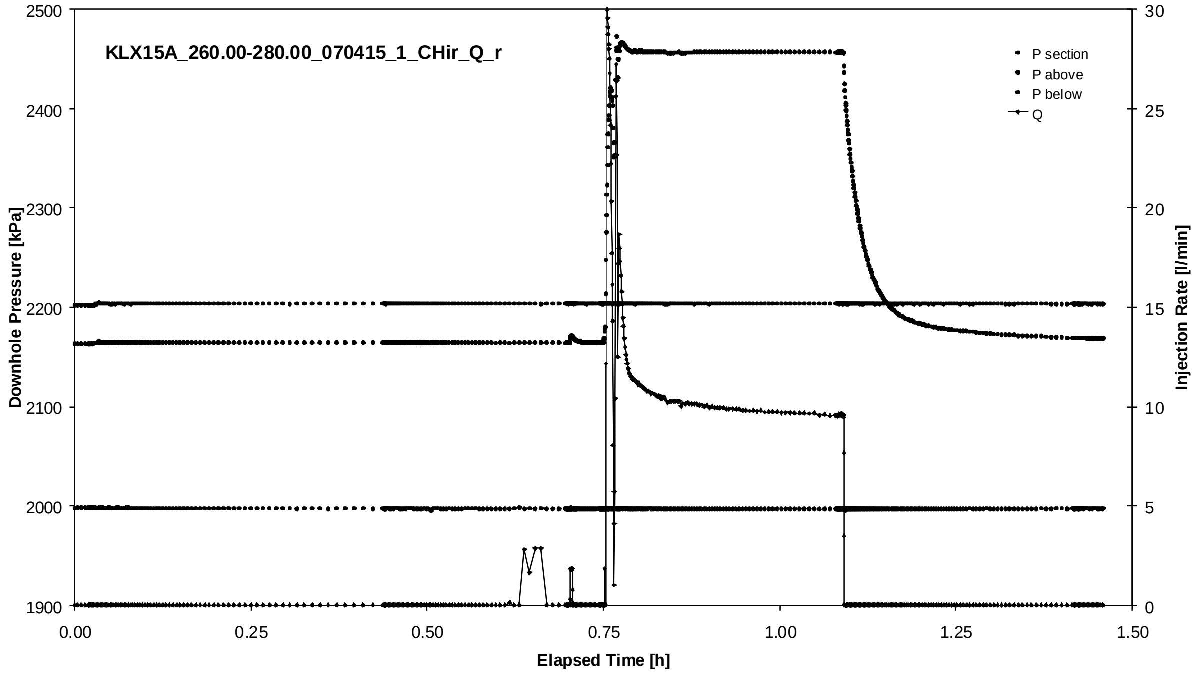


CHIR phase; HORNER match

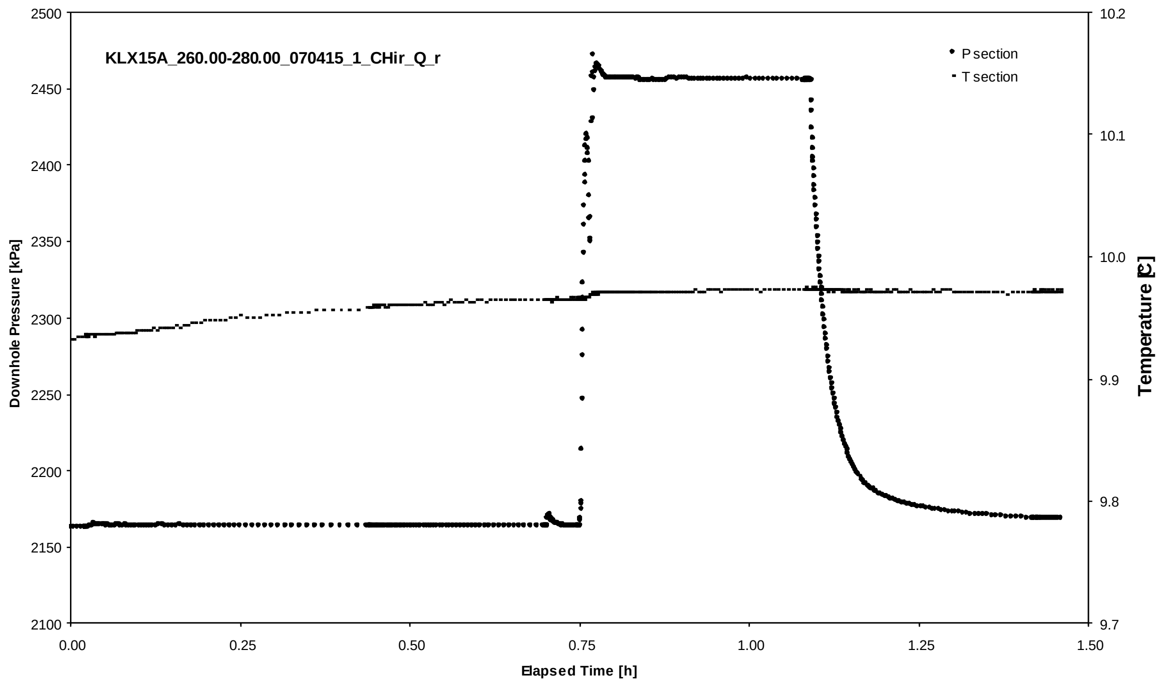
APPENDIX 2-18

Test 260.00 – 280.00 m

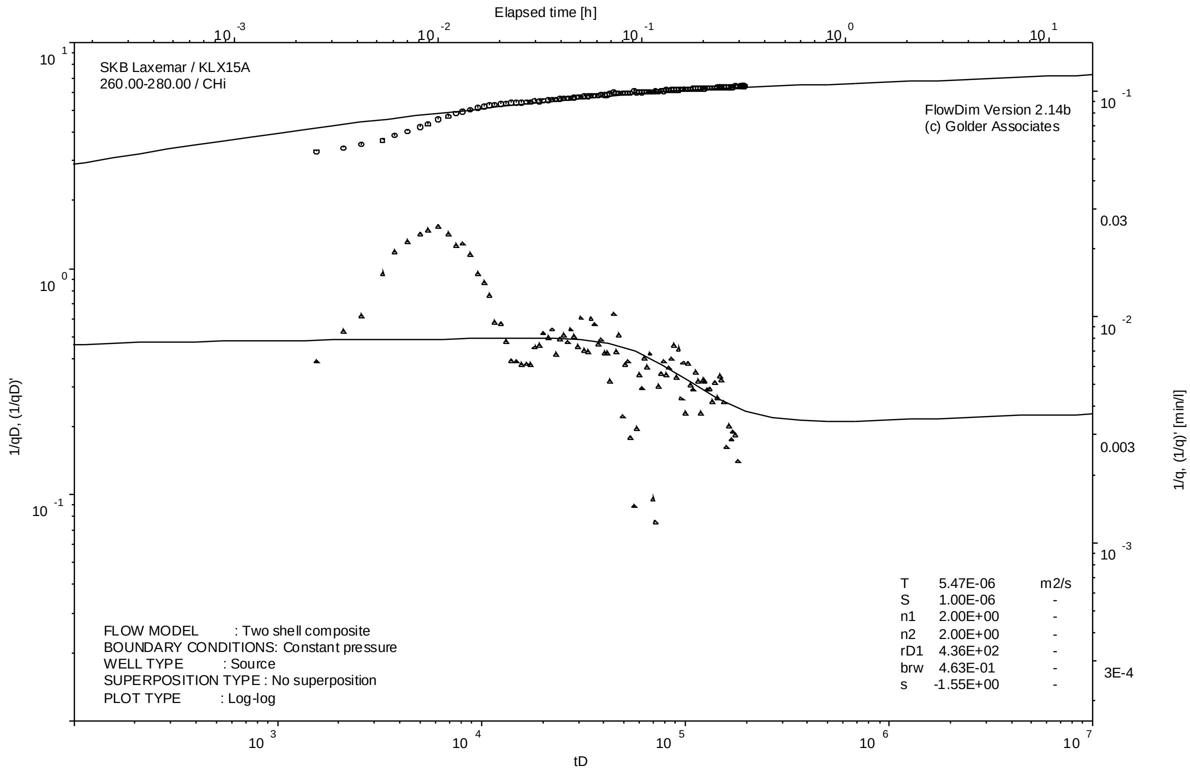
Analysis diagrams



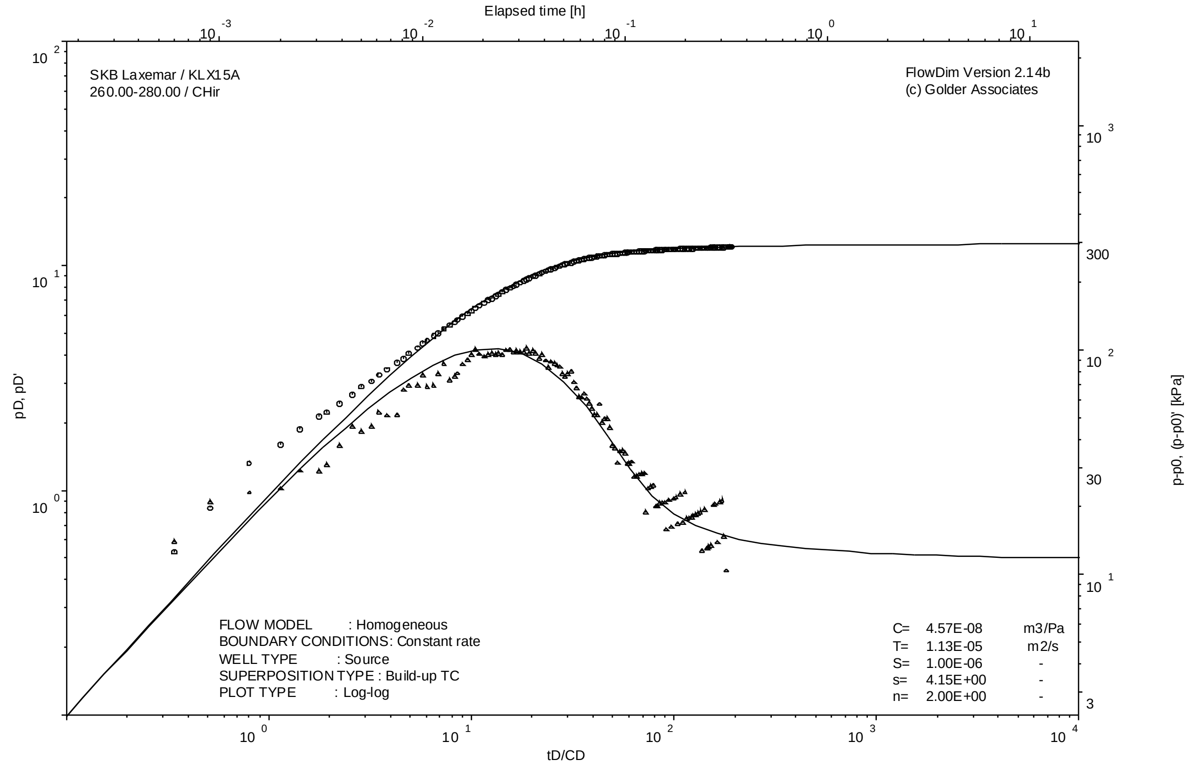
Pressure and flow rate vs. time; cartesian plot



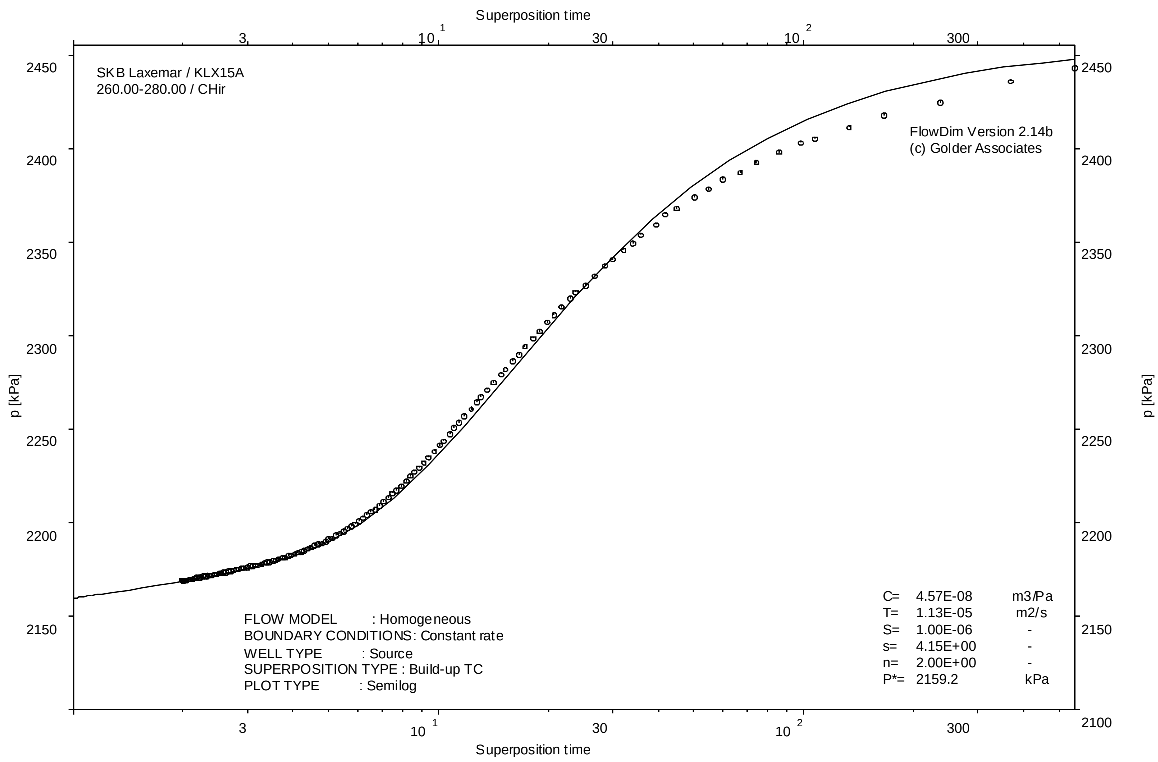
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

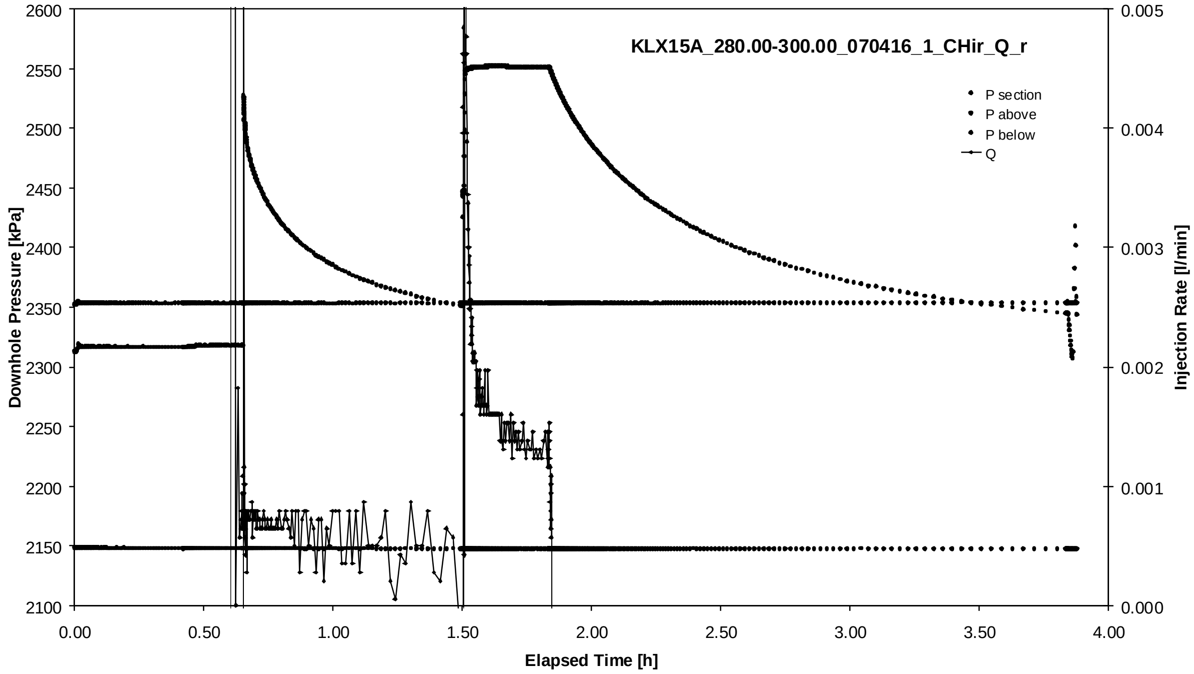


CHIR phase; HORNER match

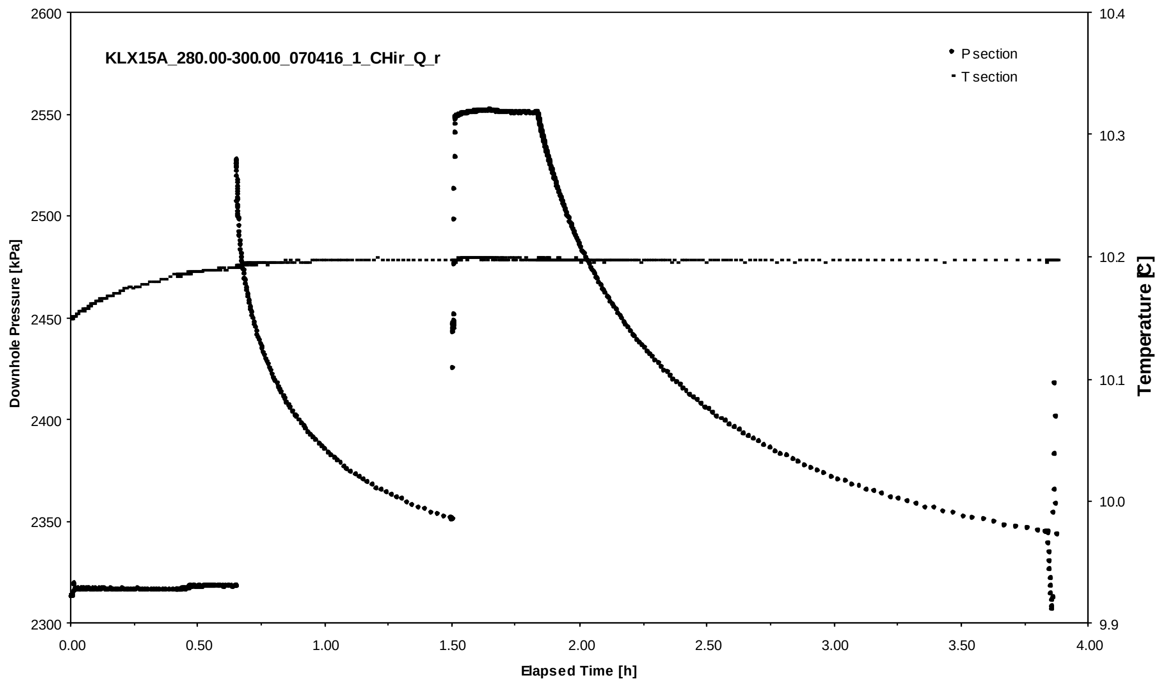
APPENDIX 2-19

Test 280.00 – 300.00 m

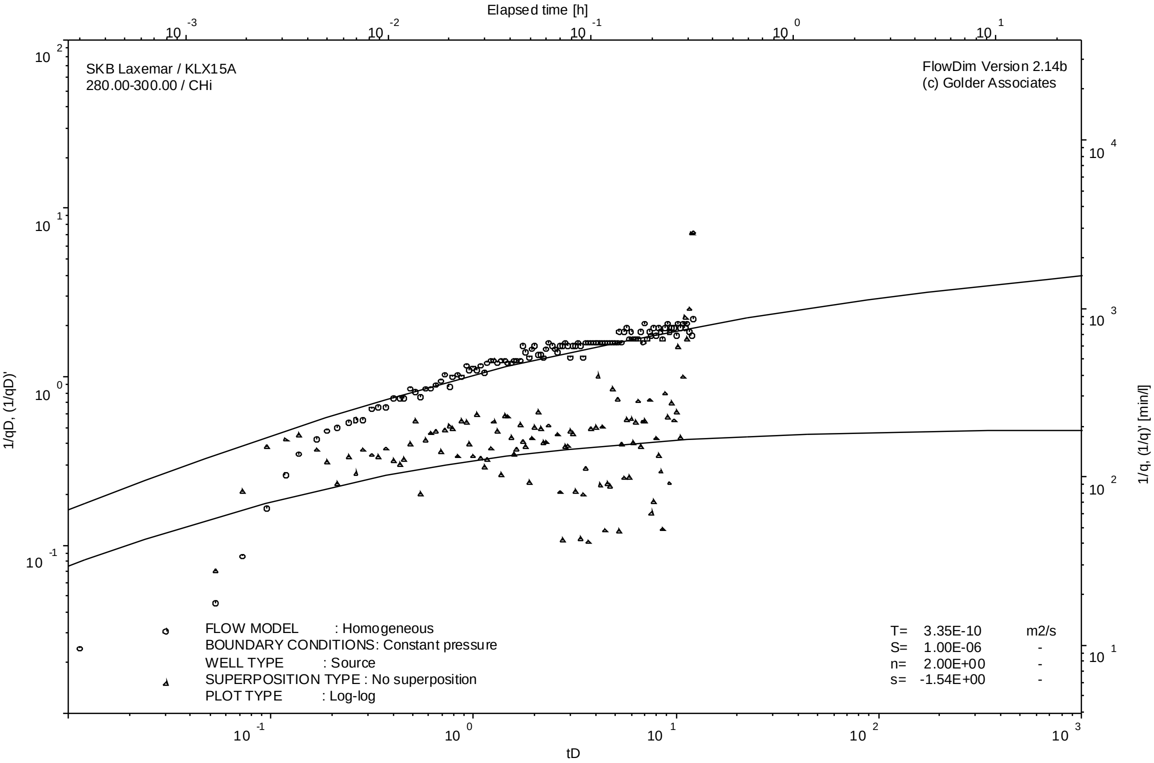
Analysis diagrams



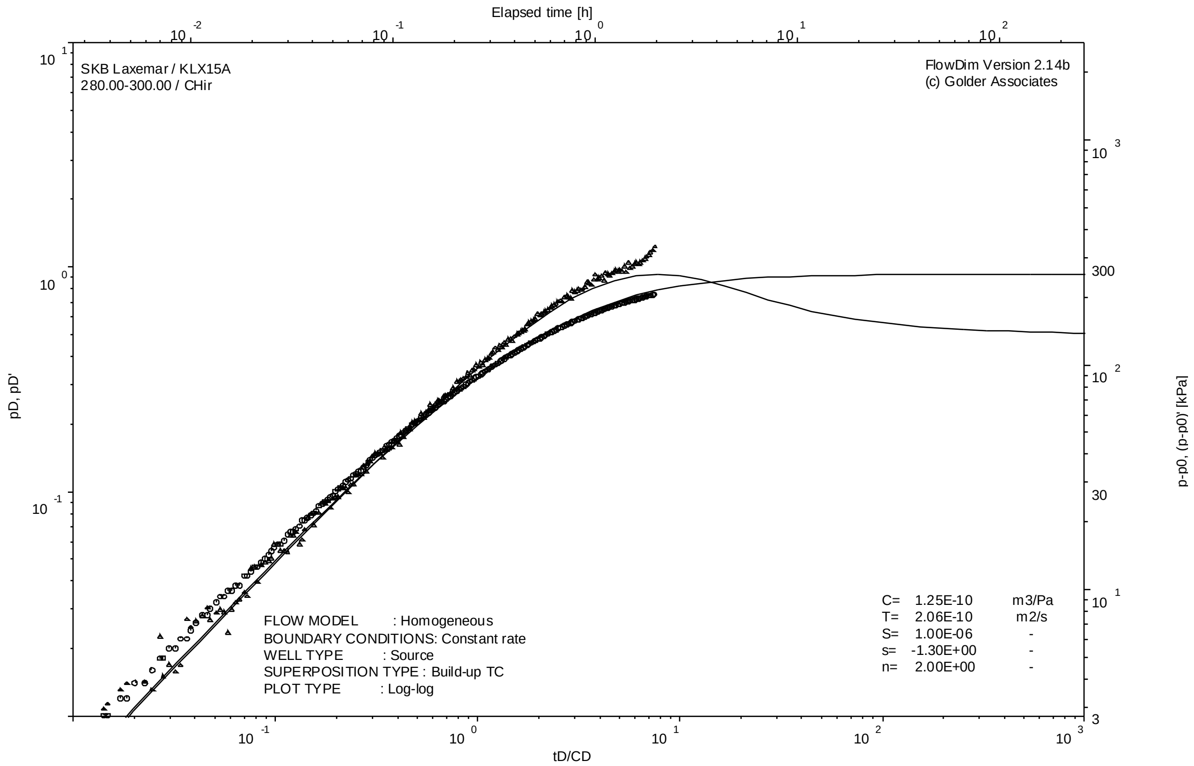
Pressure and flow rate vs. time; cartesian plot



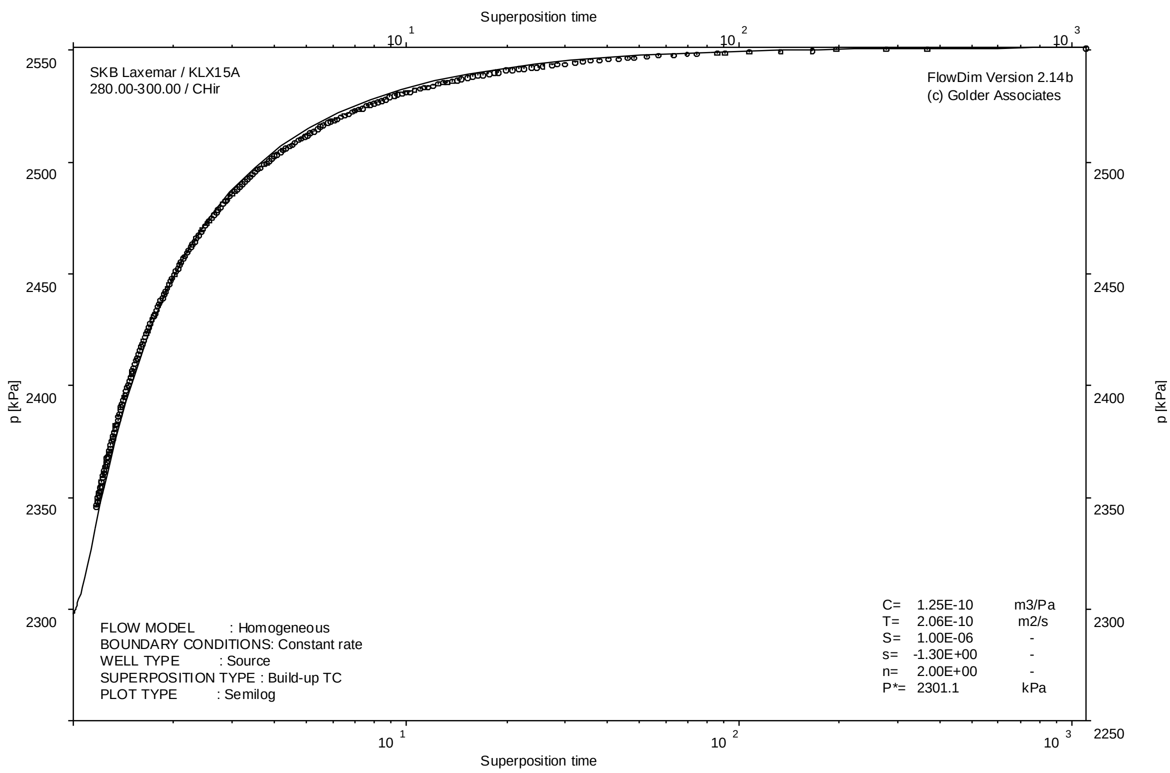
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

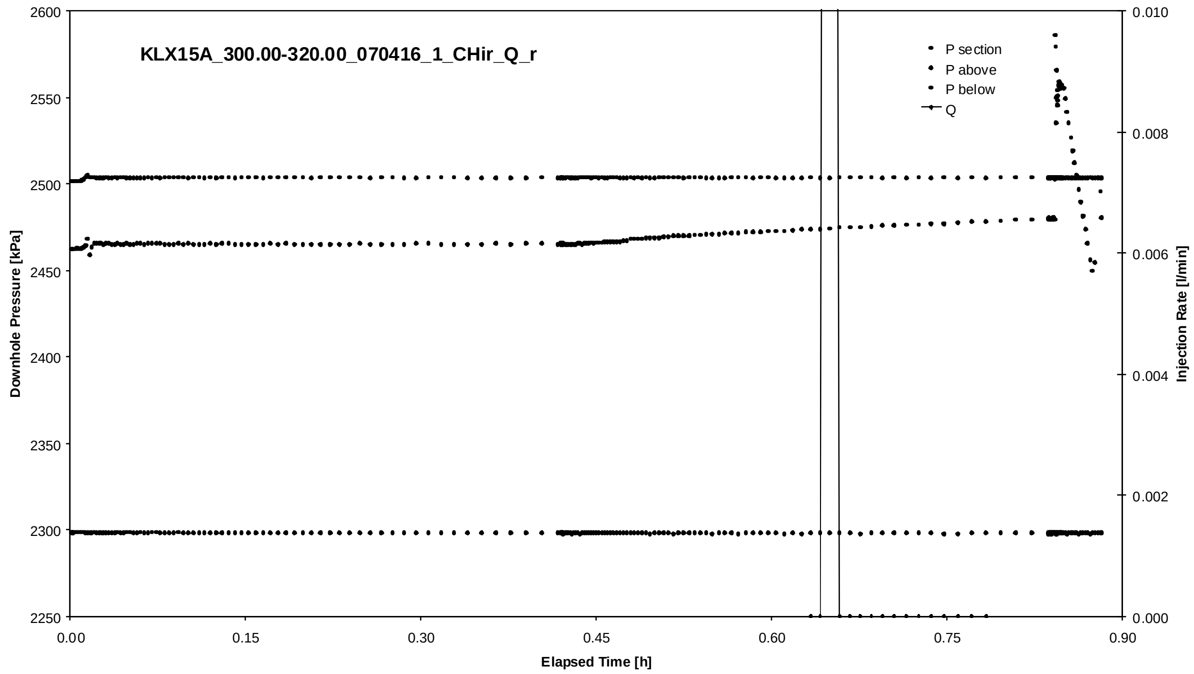


CHIR phase; HORNER match

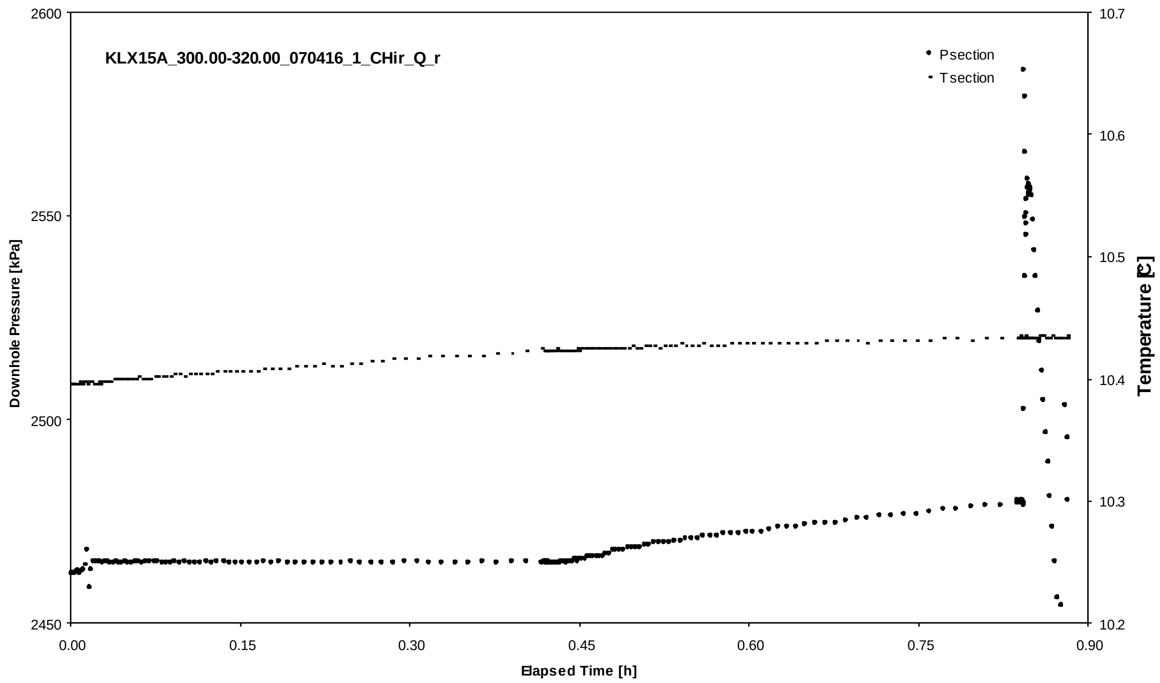
APPENDIX 2-20

Test 300.00 – 320.00 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

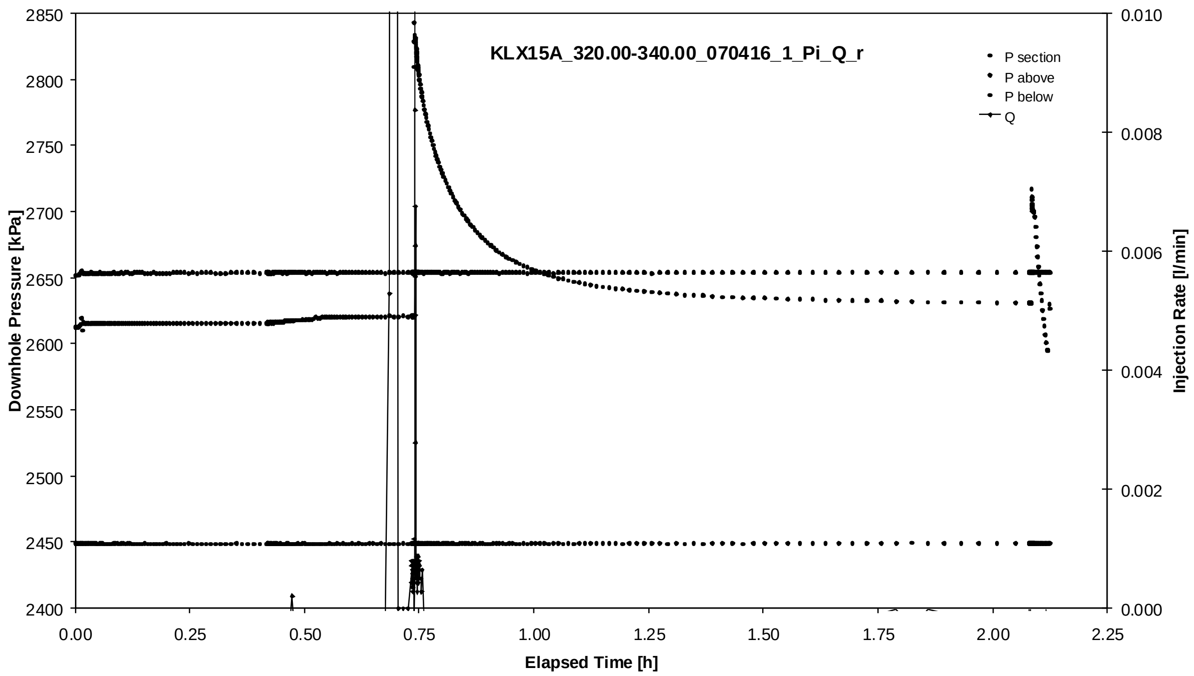
Not analysed

CHIR phase; HORNER match

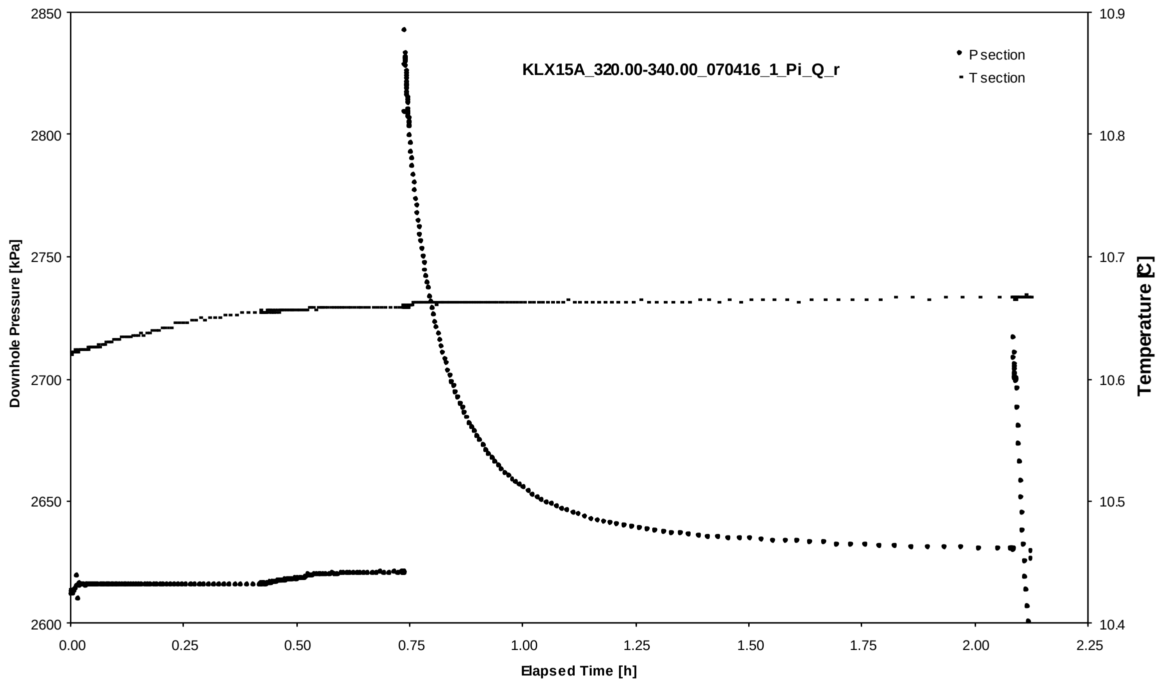
APPENDIX 2-21

Test 320.00 – 340.00 m

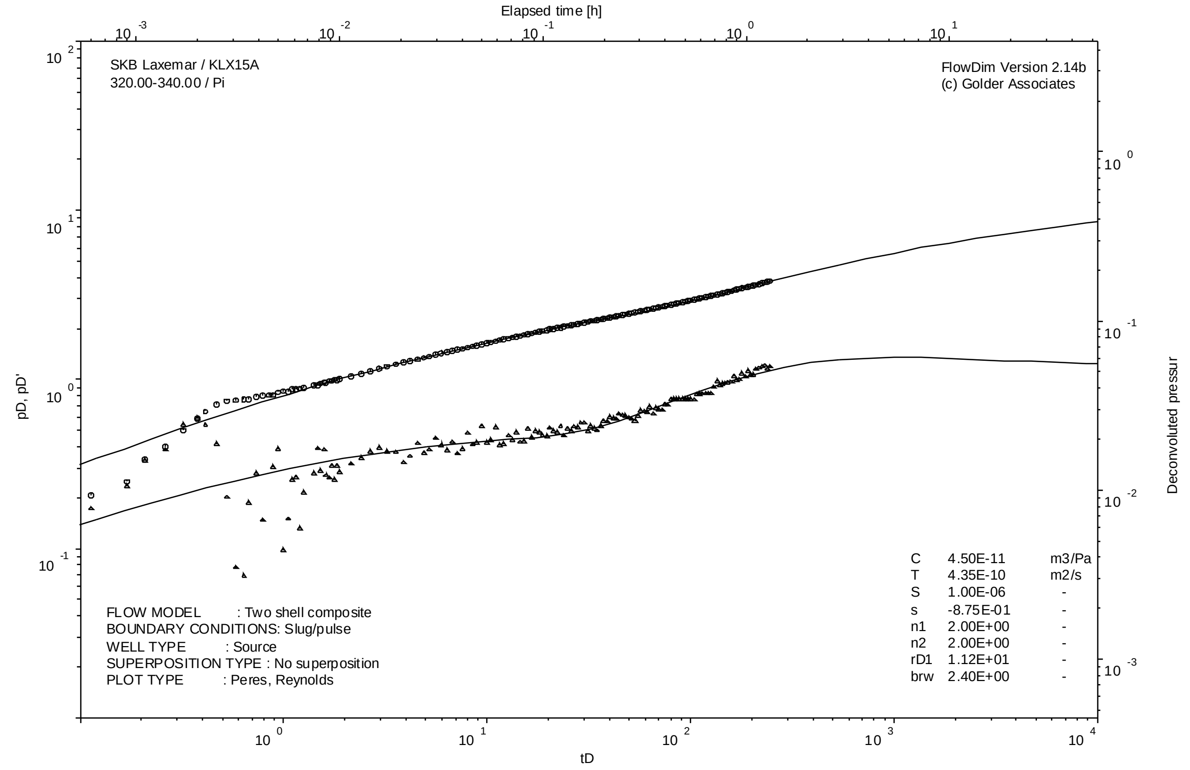
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

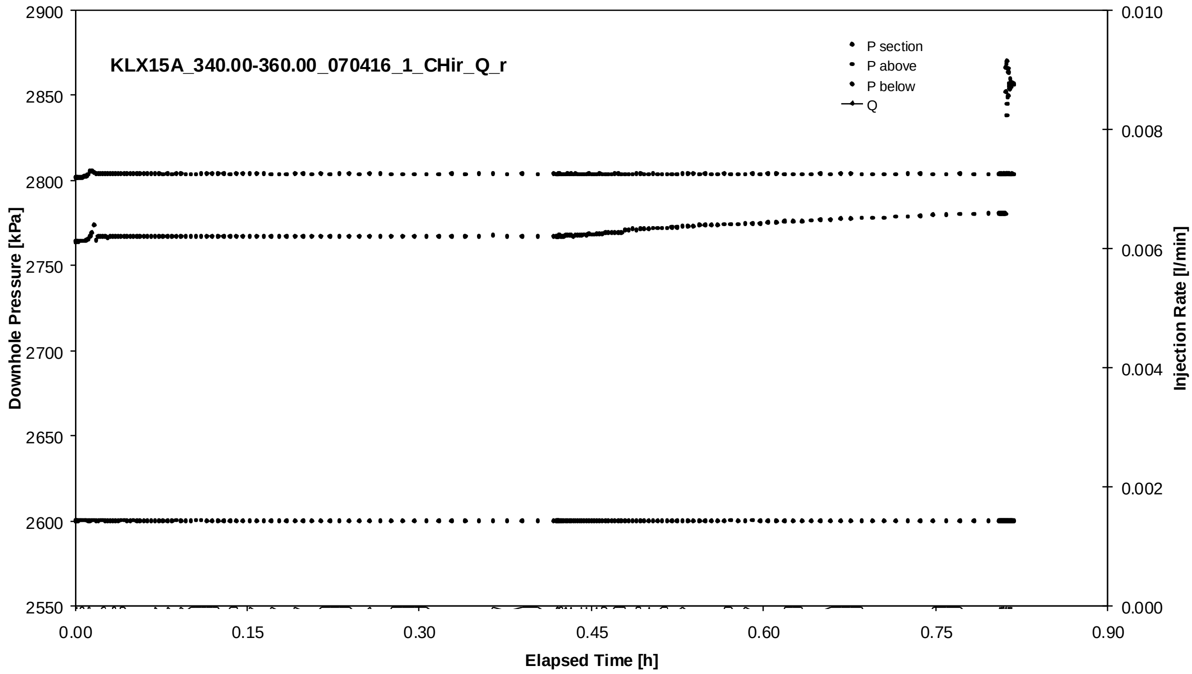


Pulse injection; deconvolution match

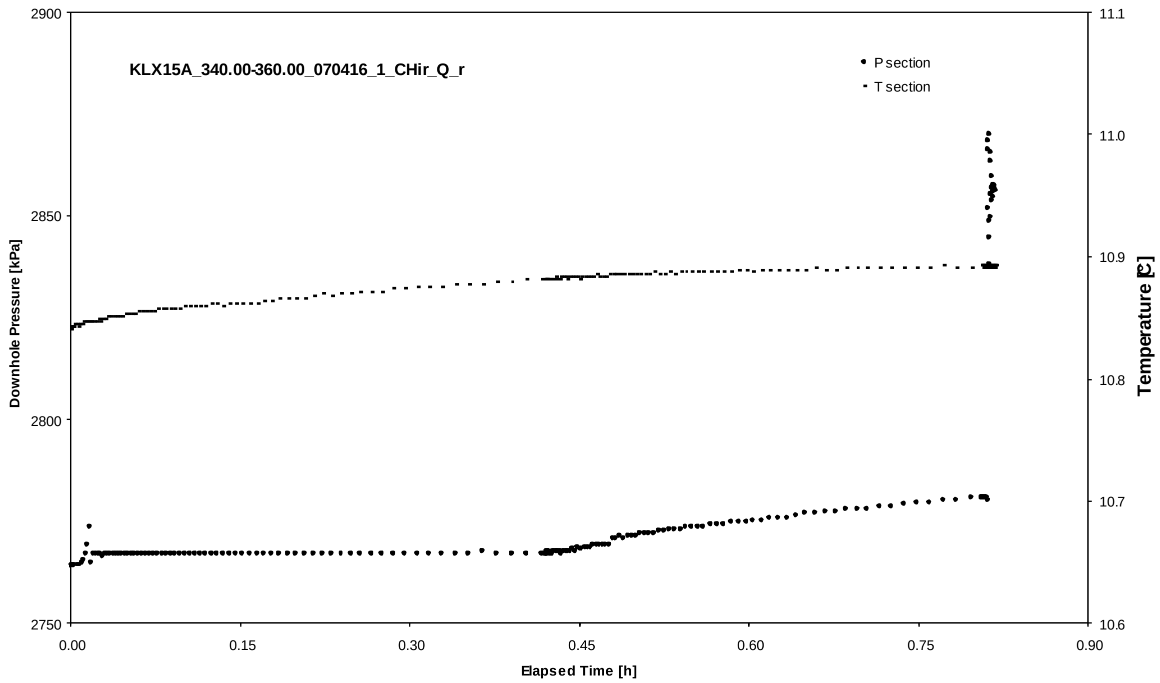
APPENDIX 2-22

Test 340.00 – 360.00 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

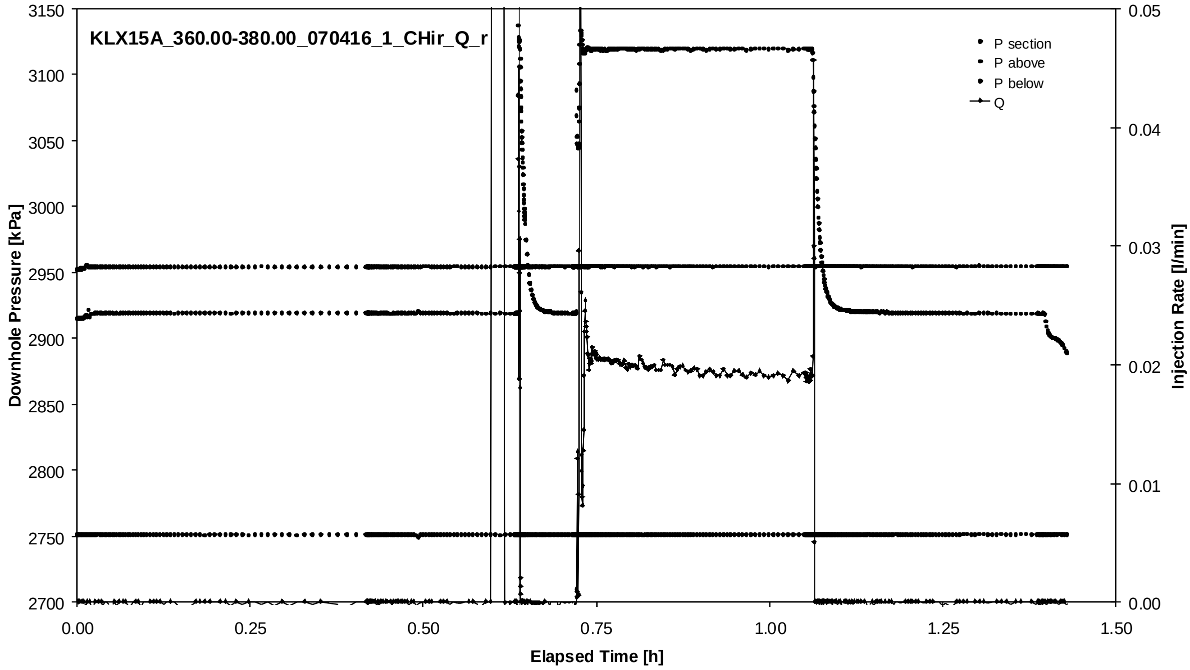
Not analysed

CHIR phase; HORNER match

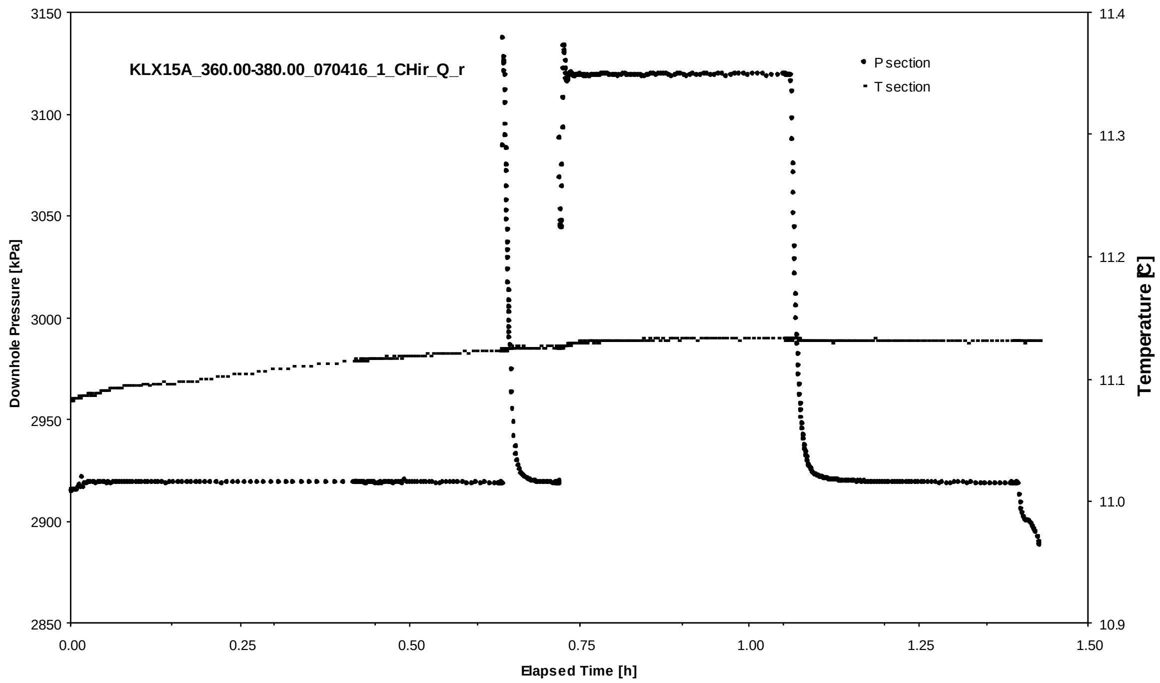
APPENDIX 2-23

Test 360.00 – 380.00 m

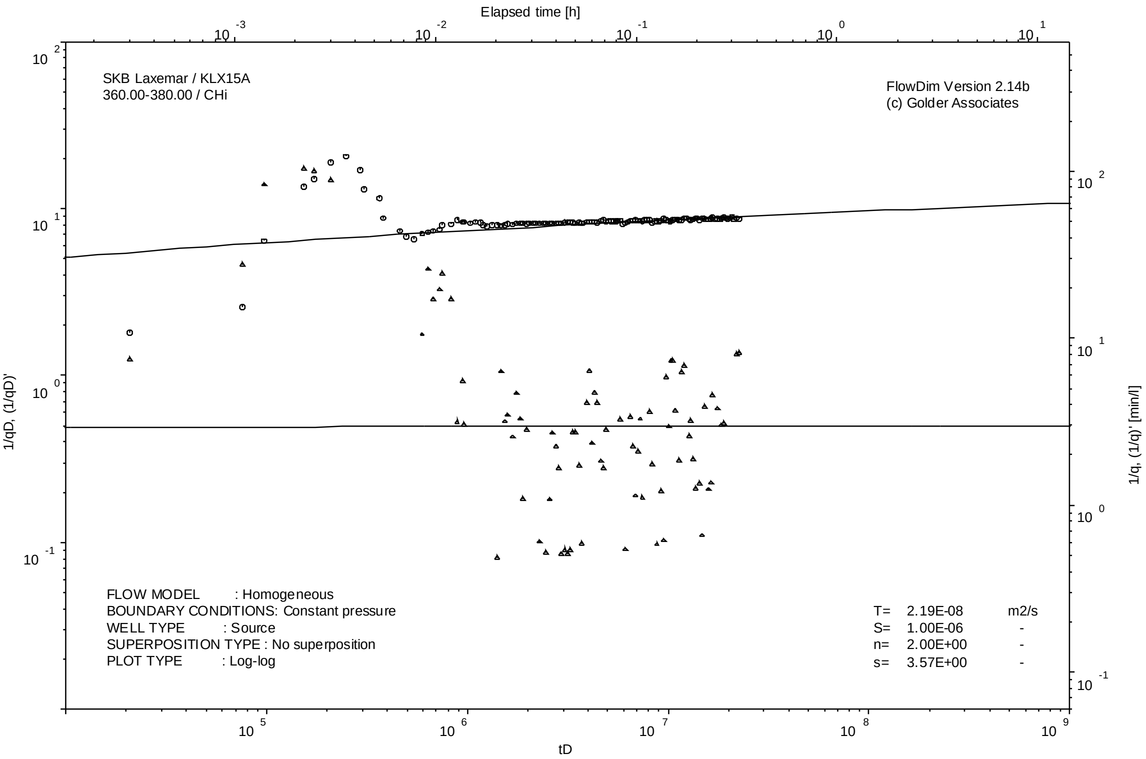
Analysis diagrams



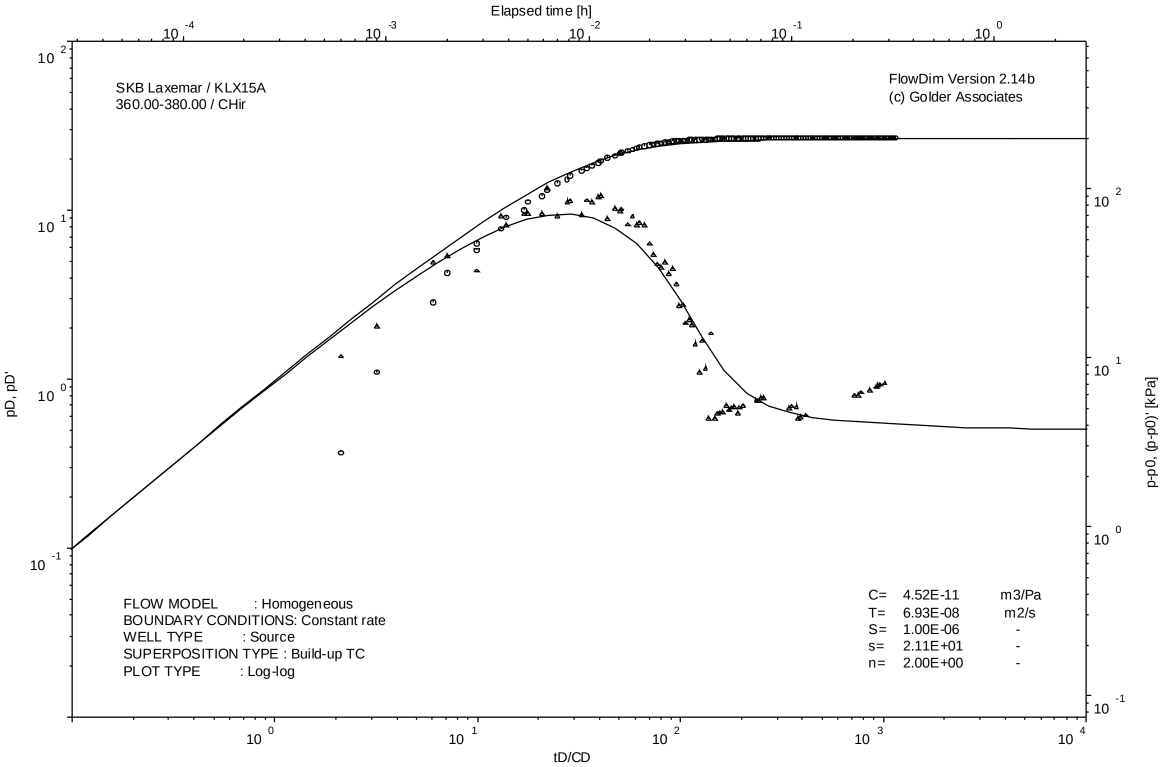
Pressure and flow rate vs. time; cartesian plot



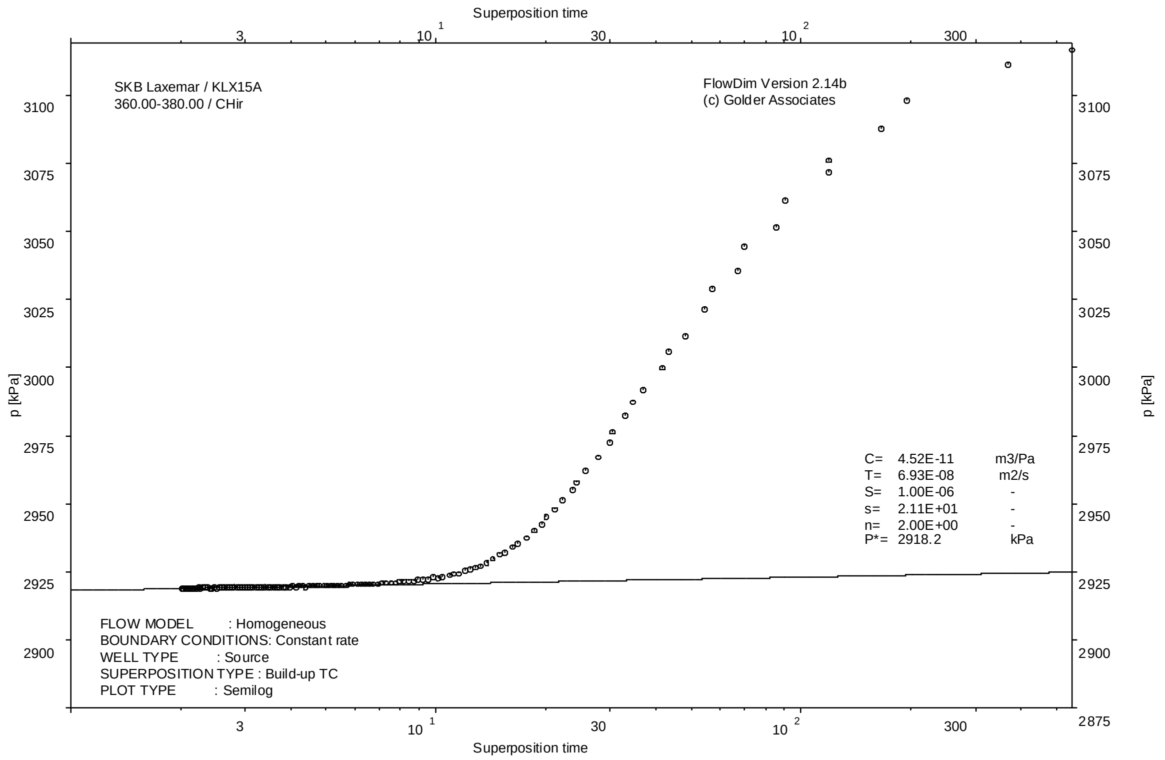
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

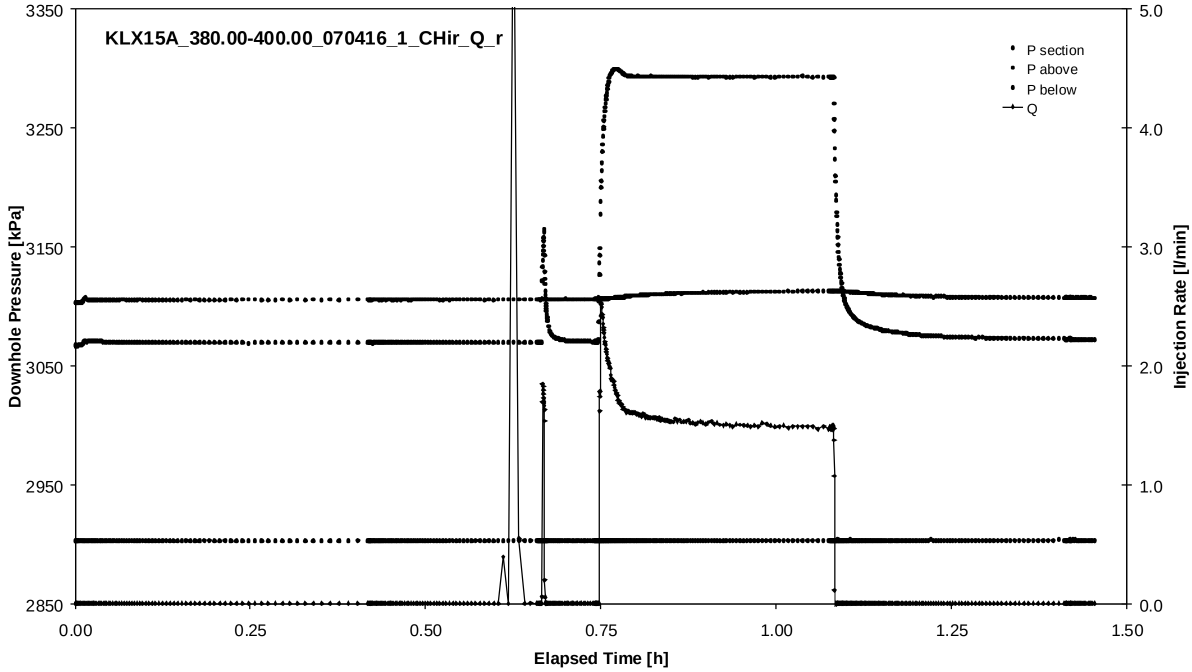


CHIR phase; HORNER match

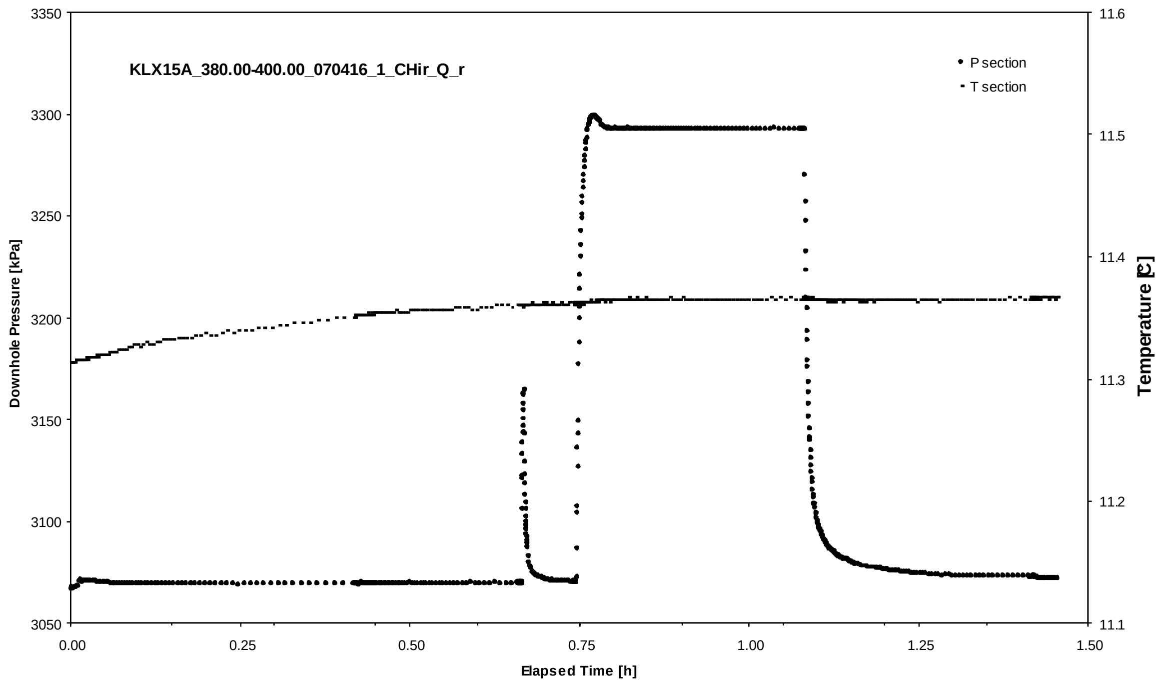
APPENDIX 2-24

Test 380.00 – 400.00 m

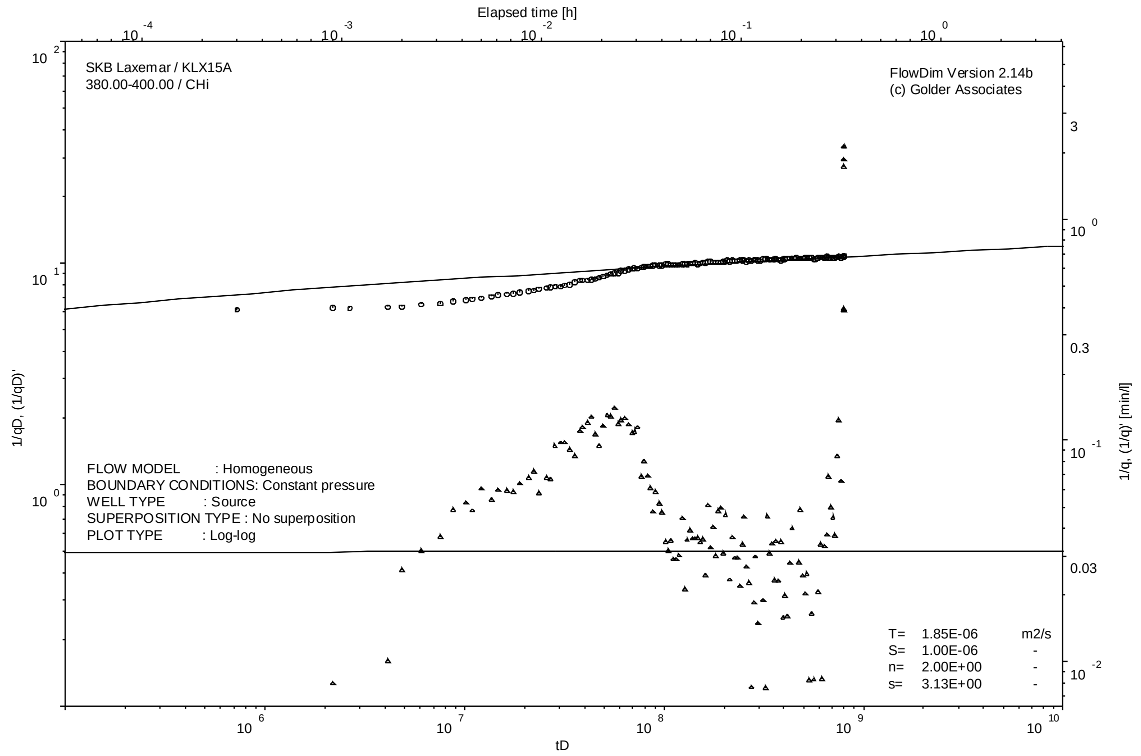
Analysis diagrams



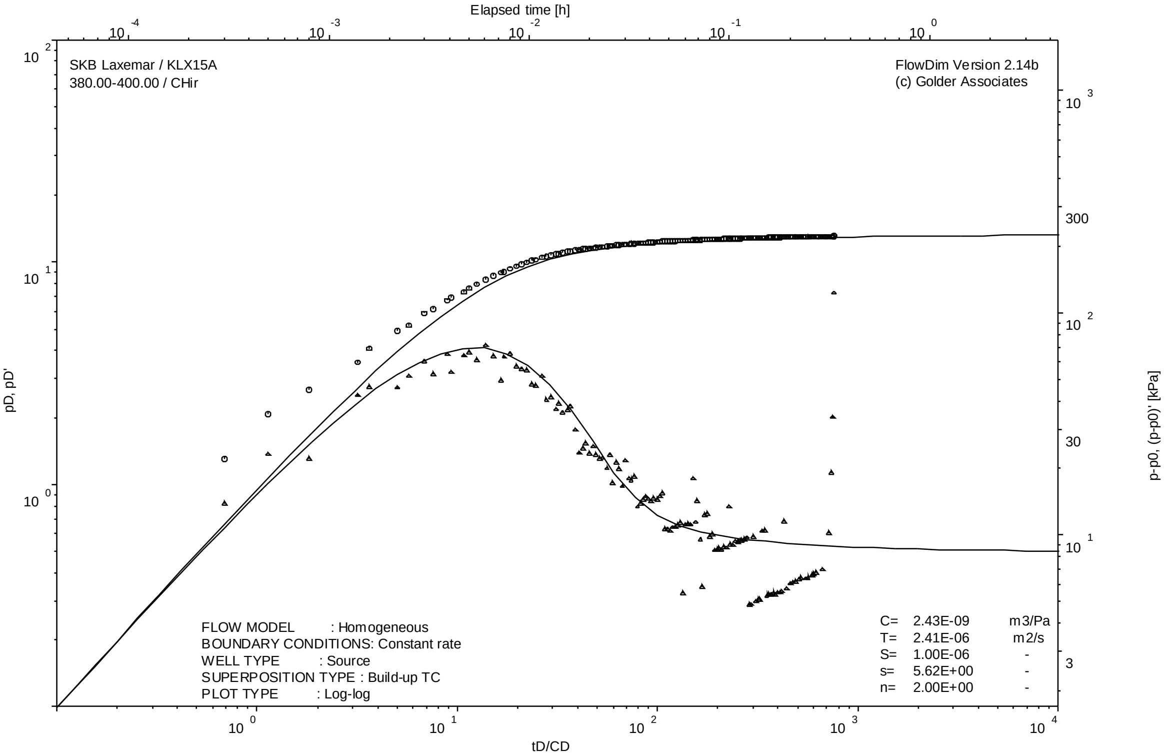
Pressure and flow rate vs. time; cartesian plot



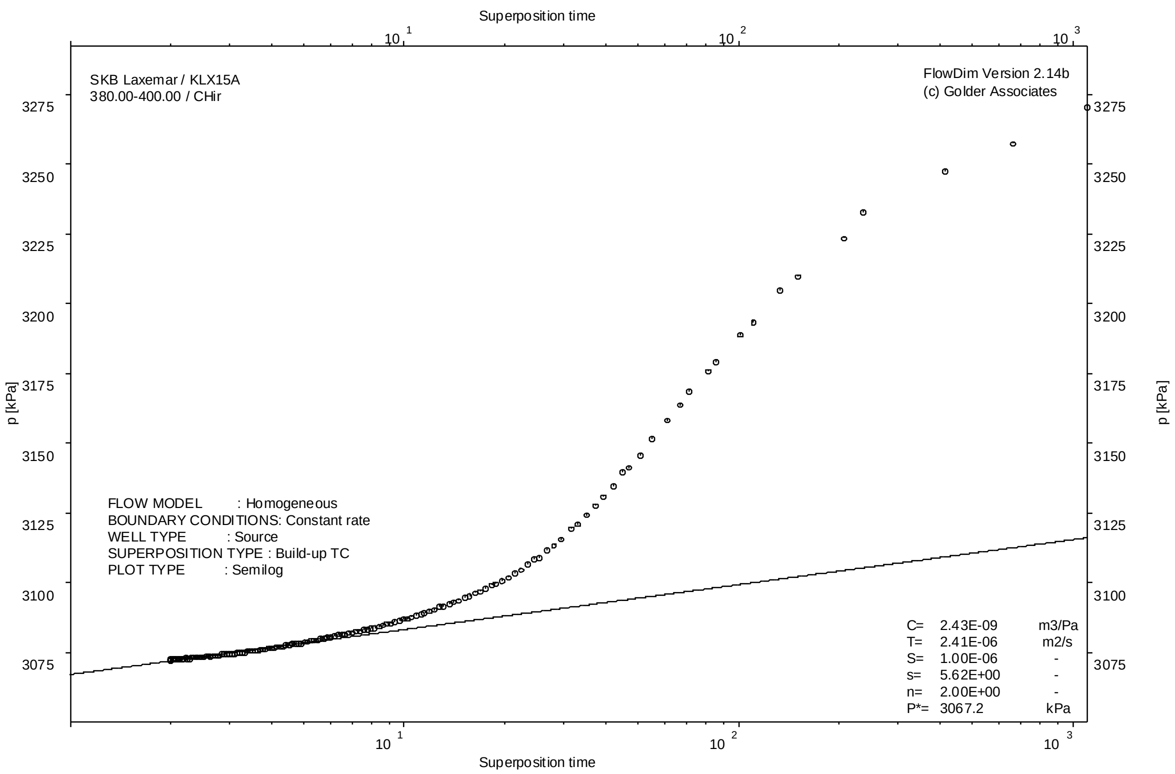
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

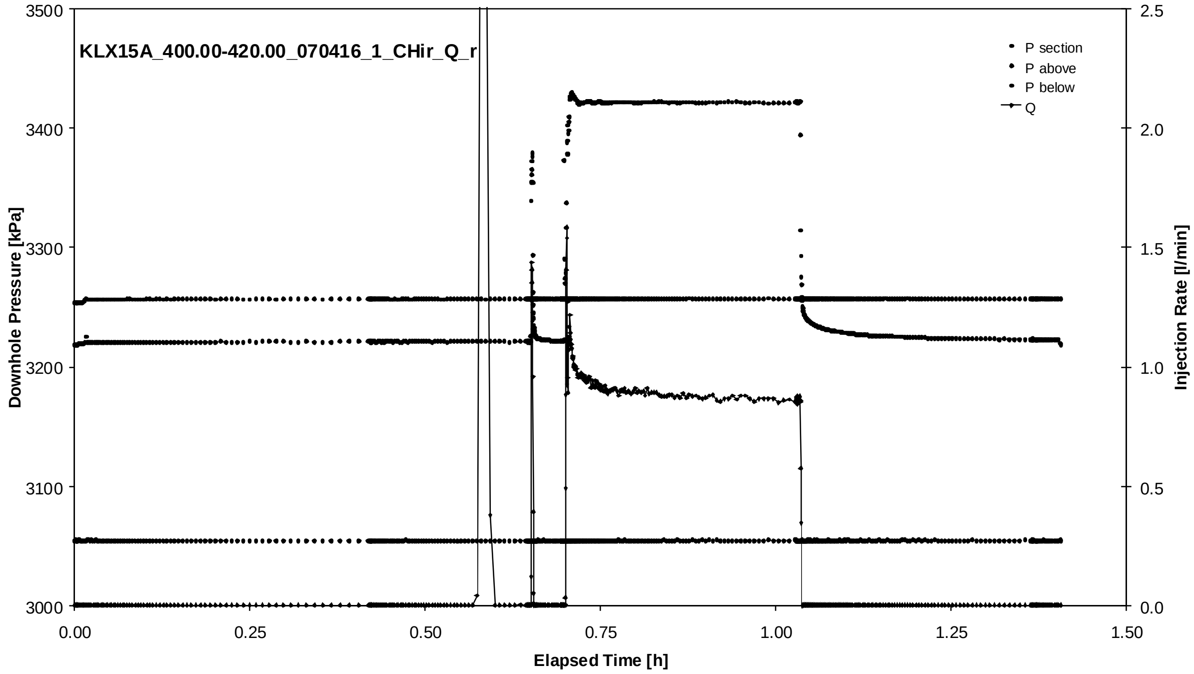


CHIR phase; HORNER match

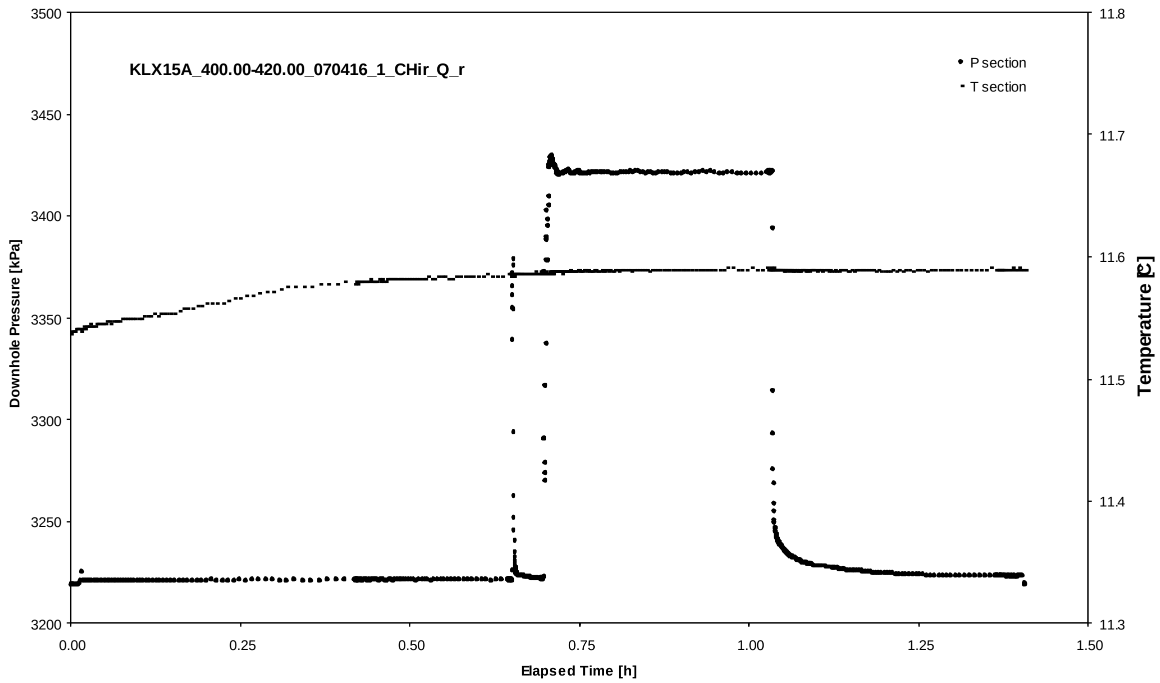
APPENDIX 2-25

Test 400.00 – 420.00 m

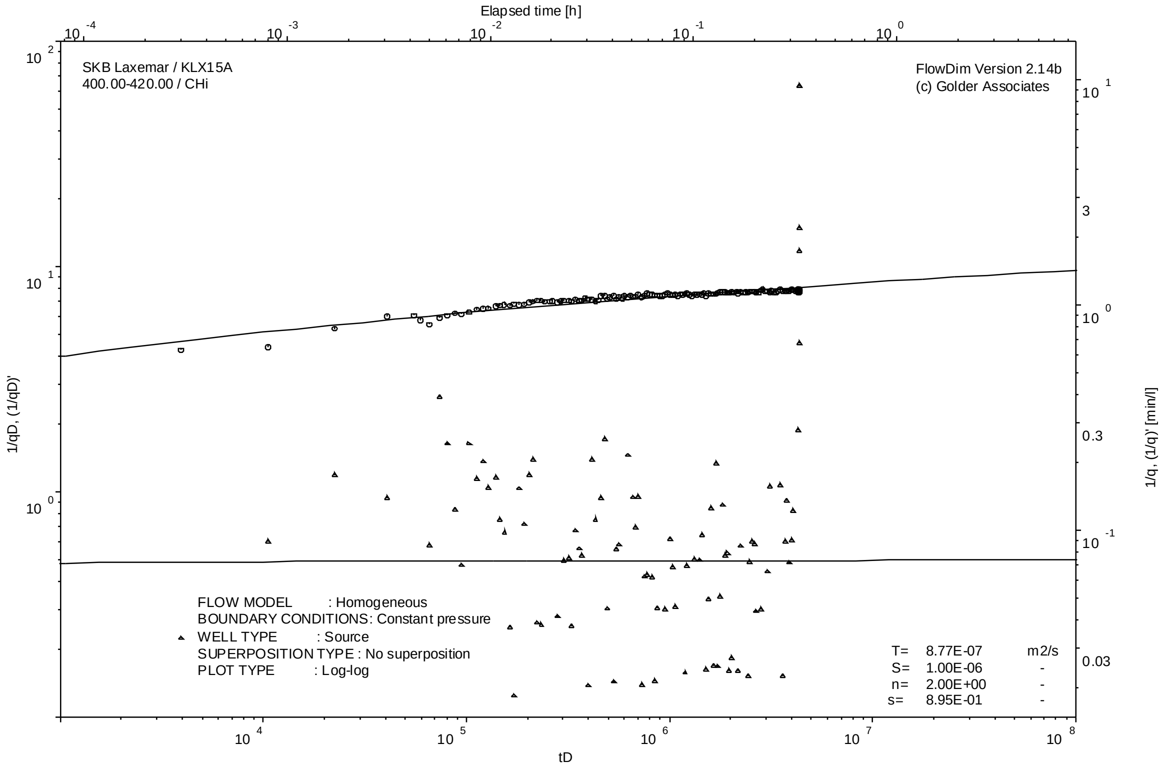
Analysis diagrams



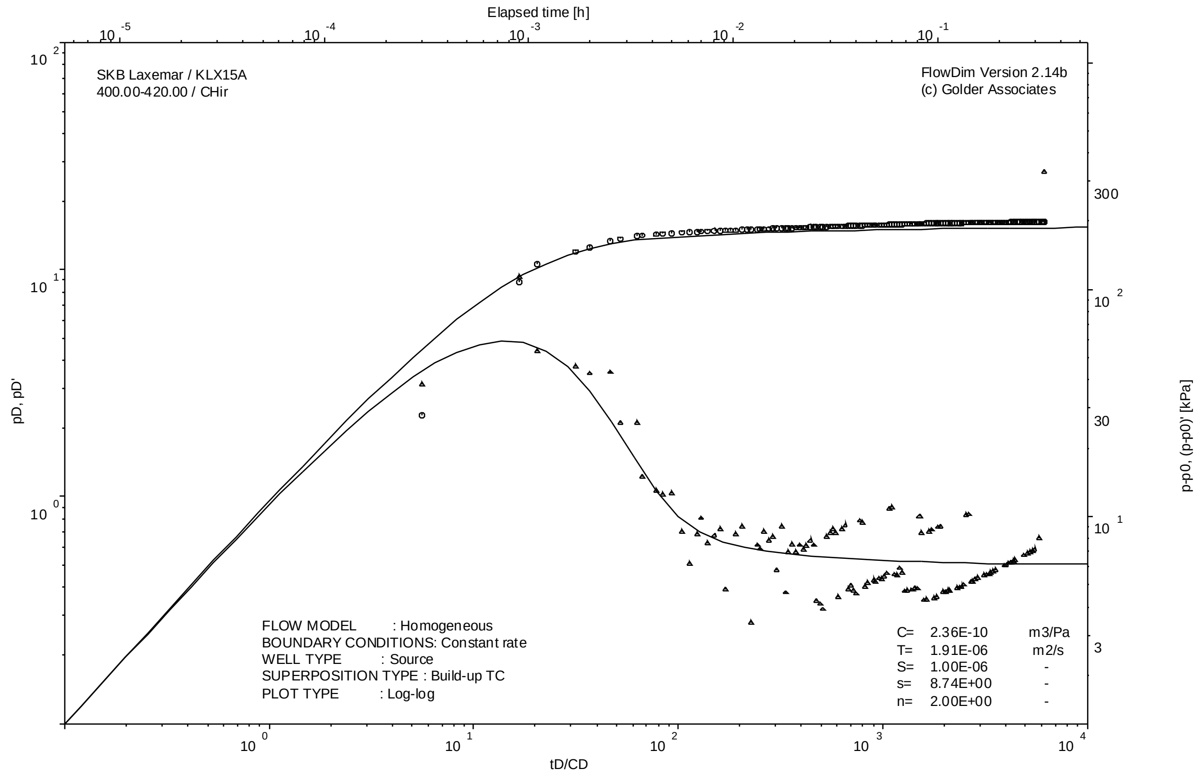
Pressure and flow rate vs. time; cartesian plot



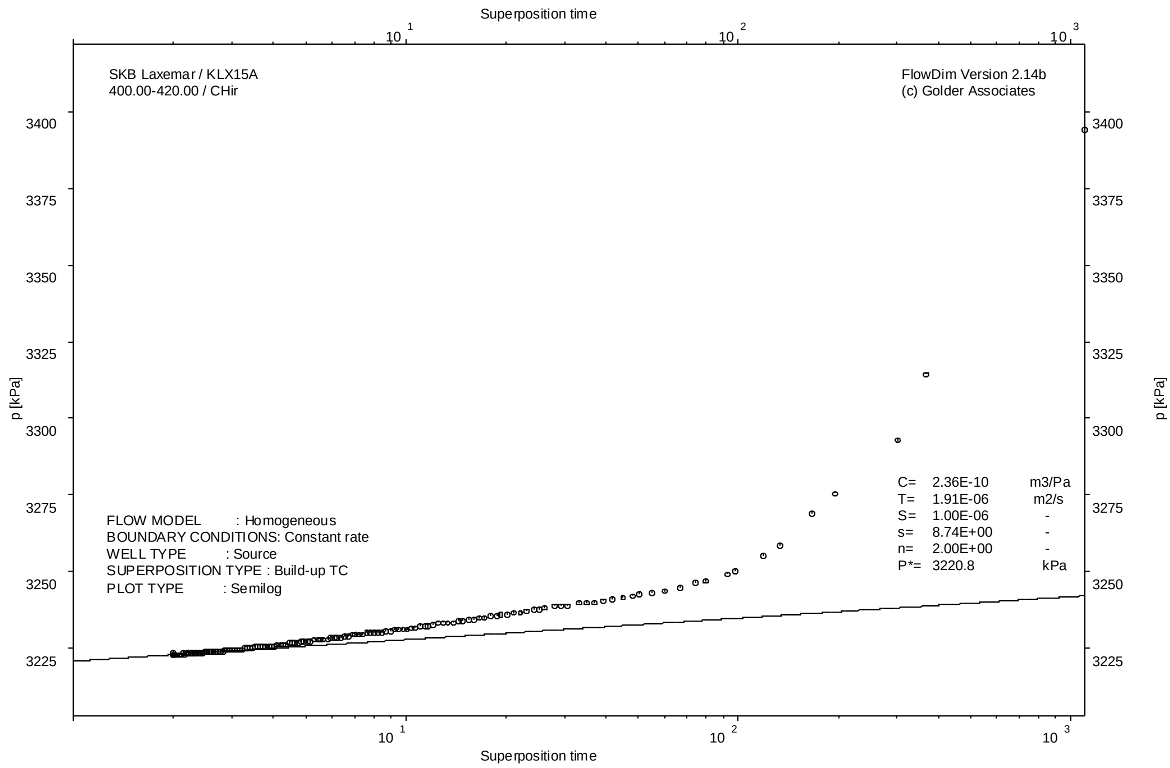
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

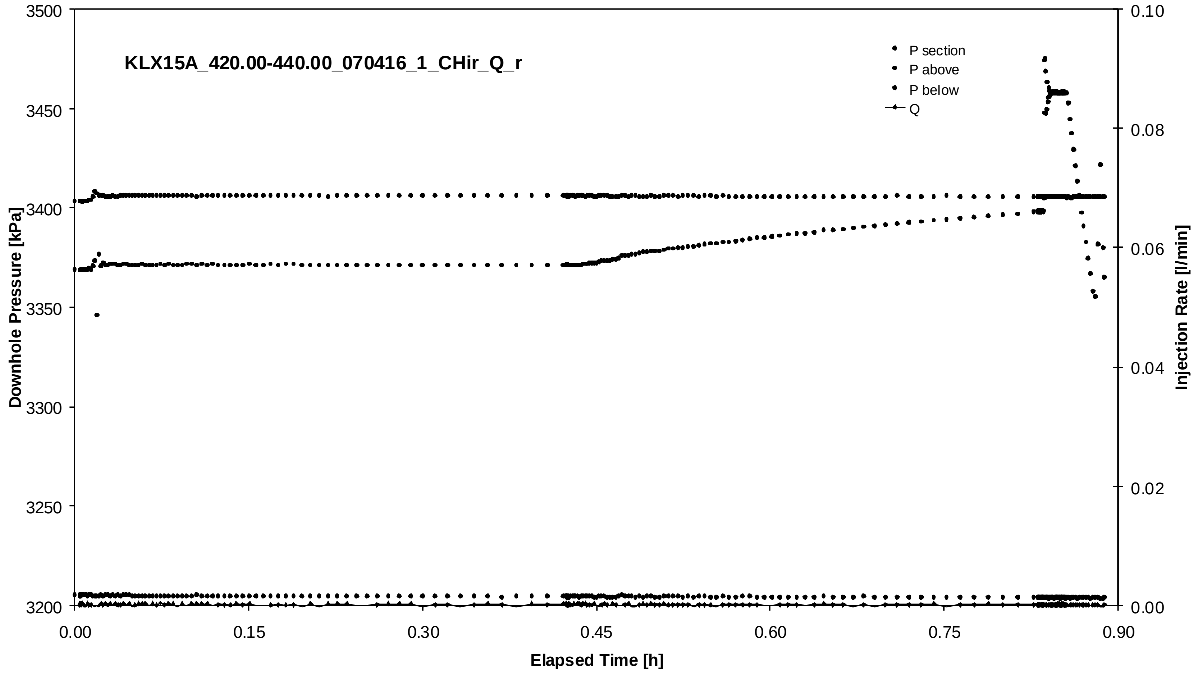


CHIR phase; HORNER match

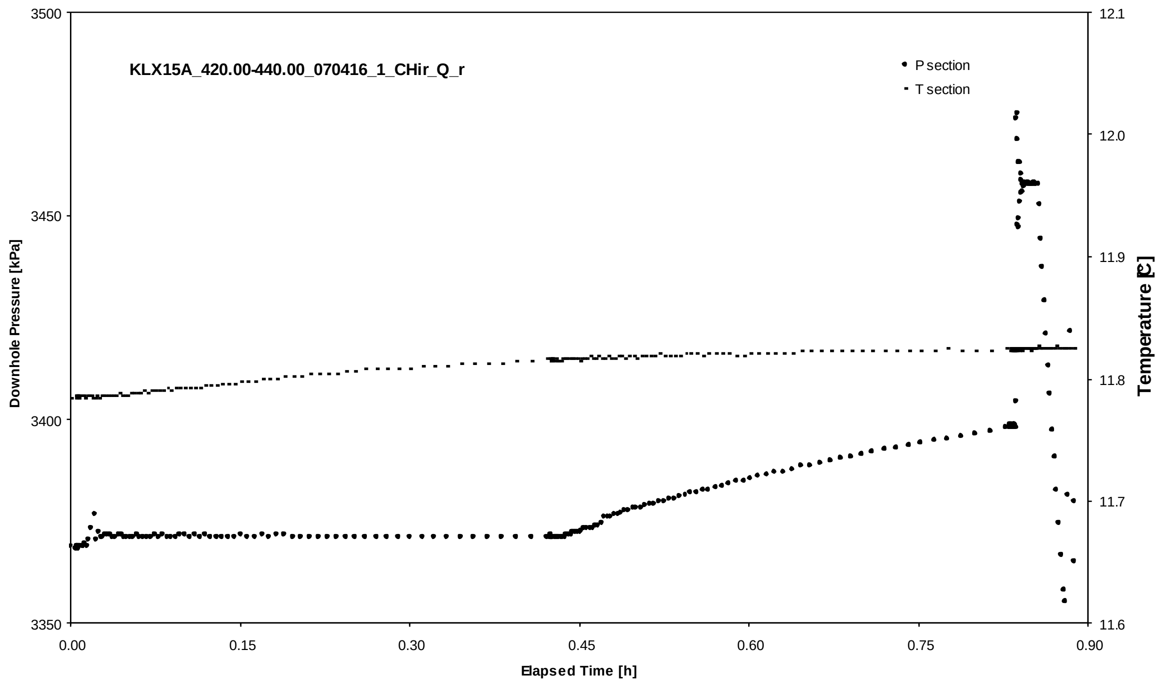
APPENDIX 2-26

Test 420.00 – 440.00 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

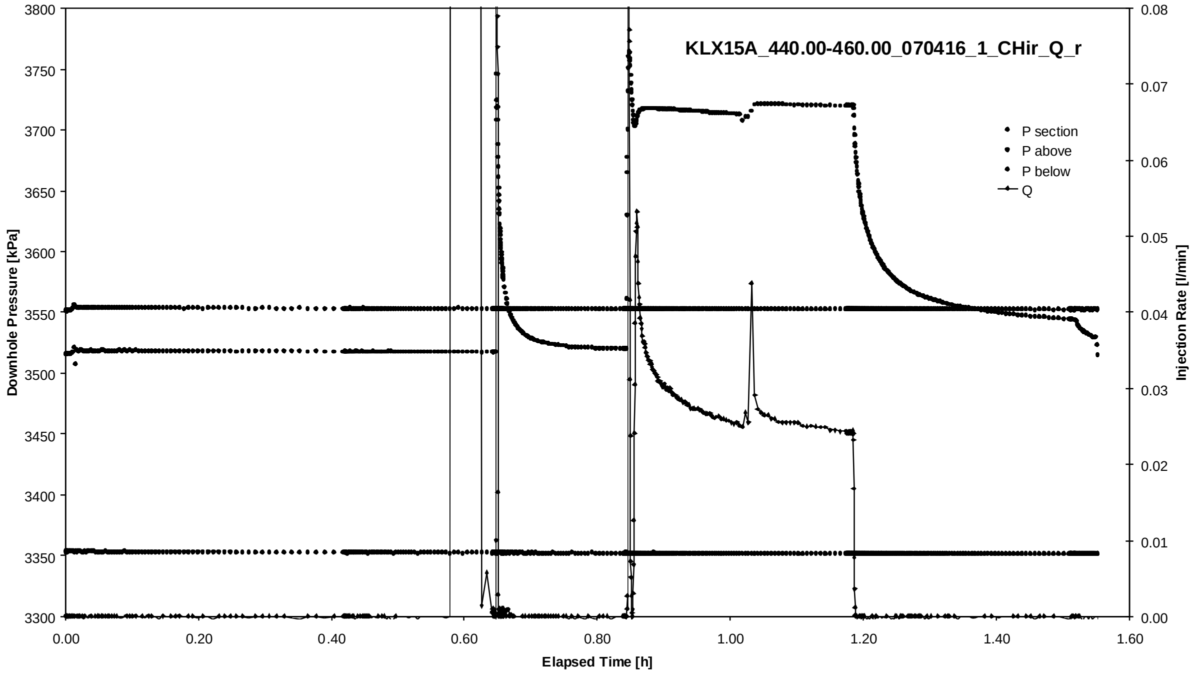
Not analysed

CHIR phase; HORNER match

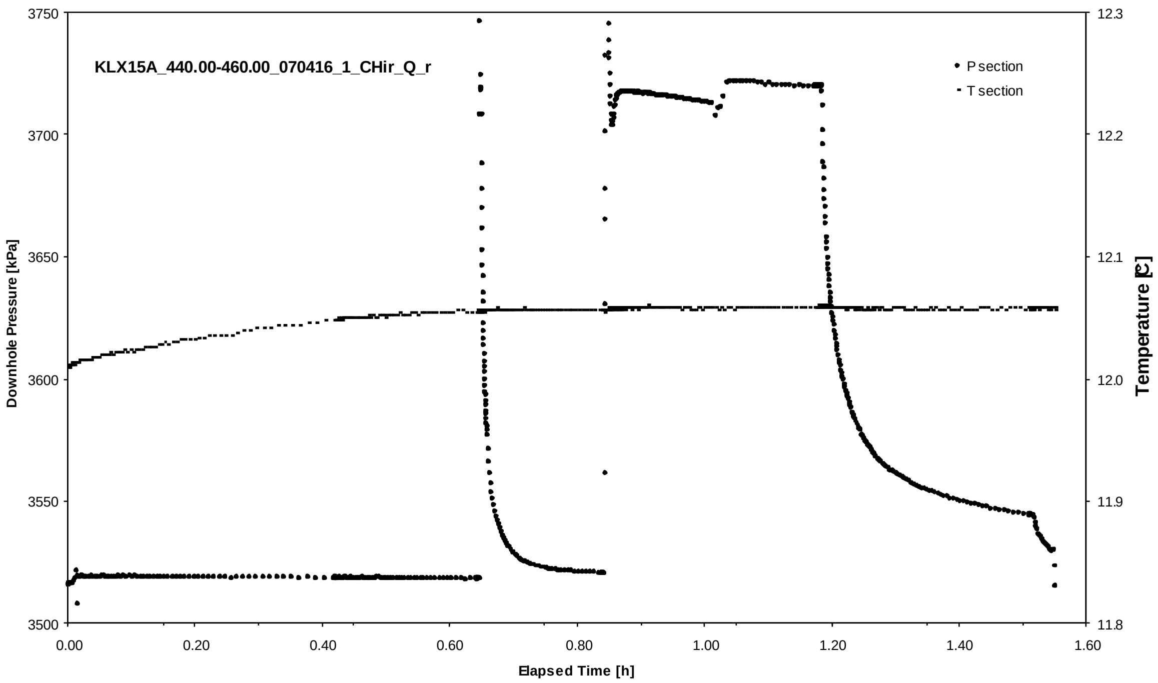
APPENDIX 2-27

Test 440.00 – 460.00 m

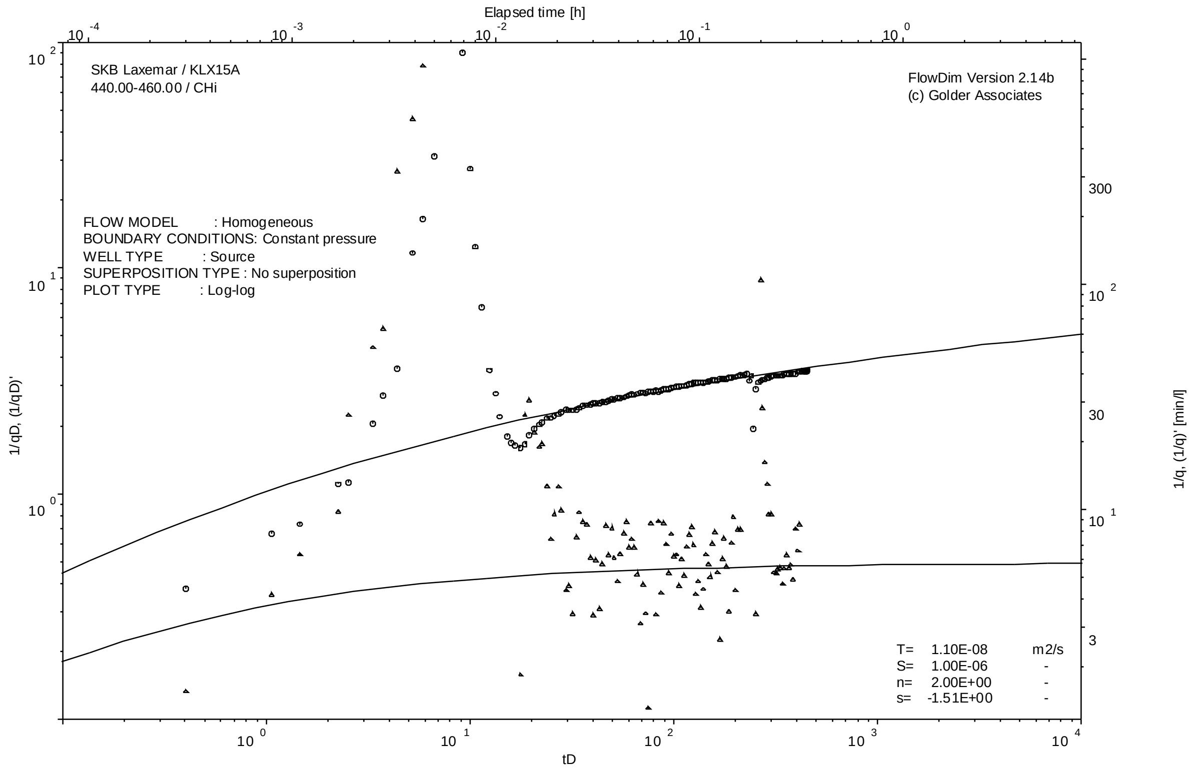
Analysis diagrams



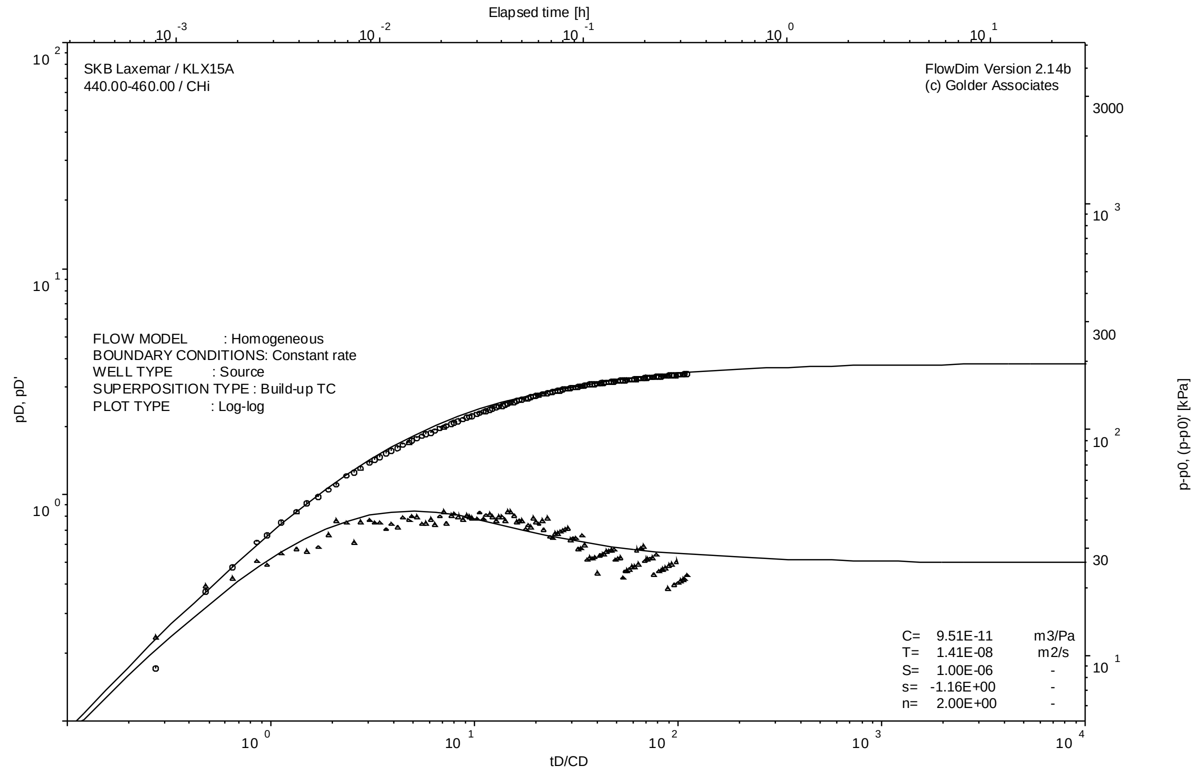
Pressure and flow rate vs. time; cartesian plot



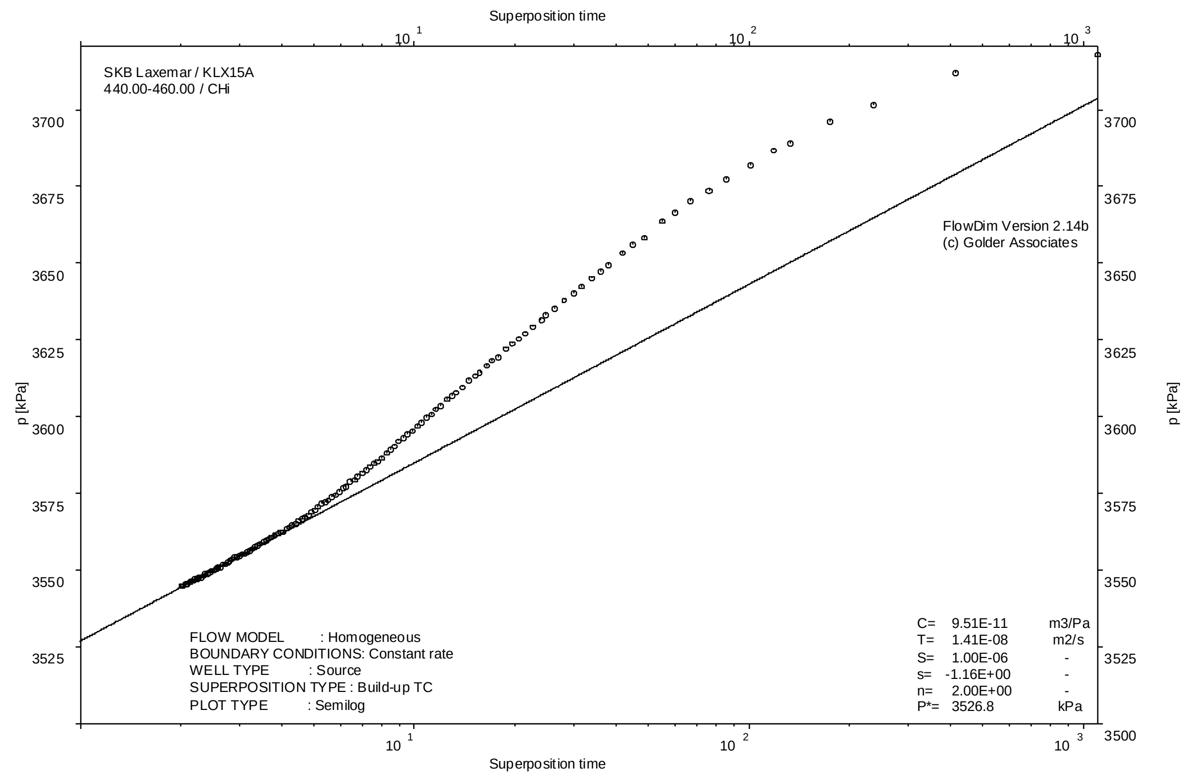
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

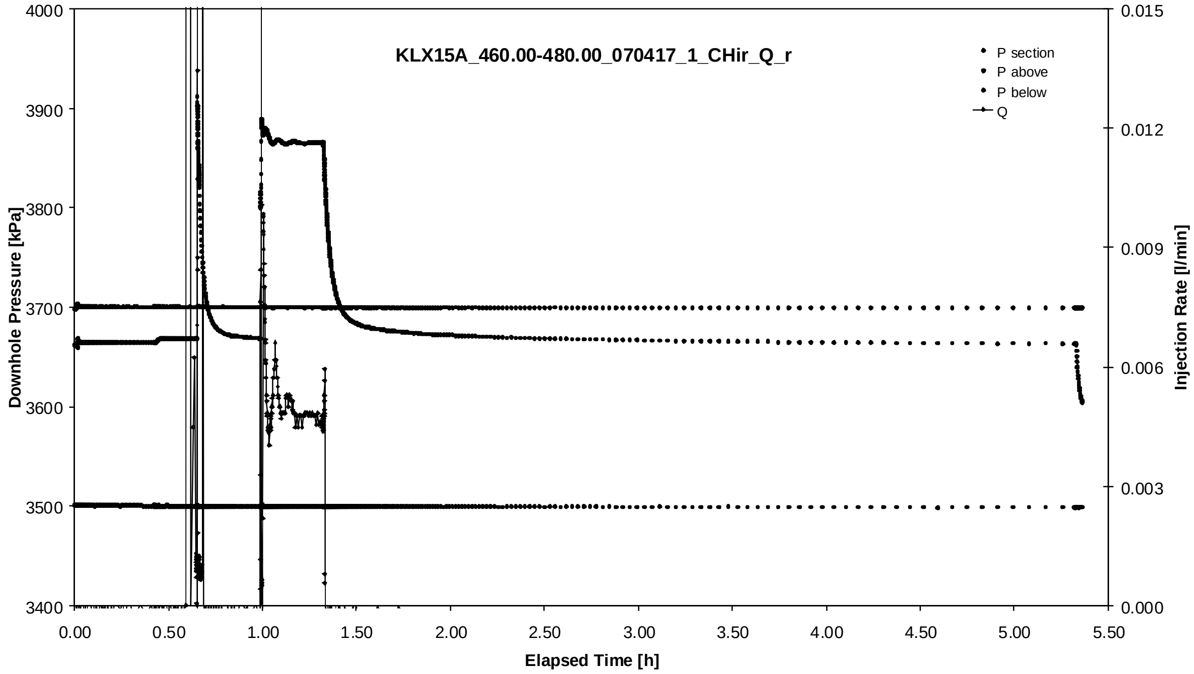


CHIR phase; HORNER match

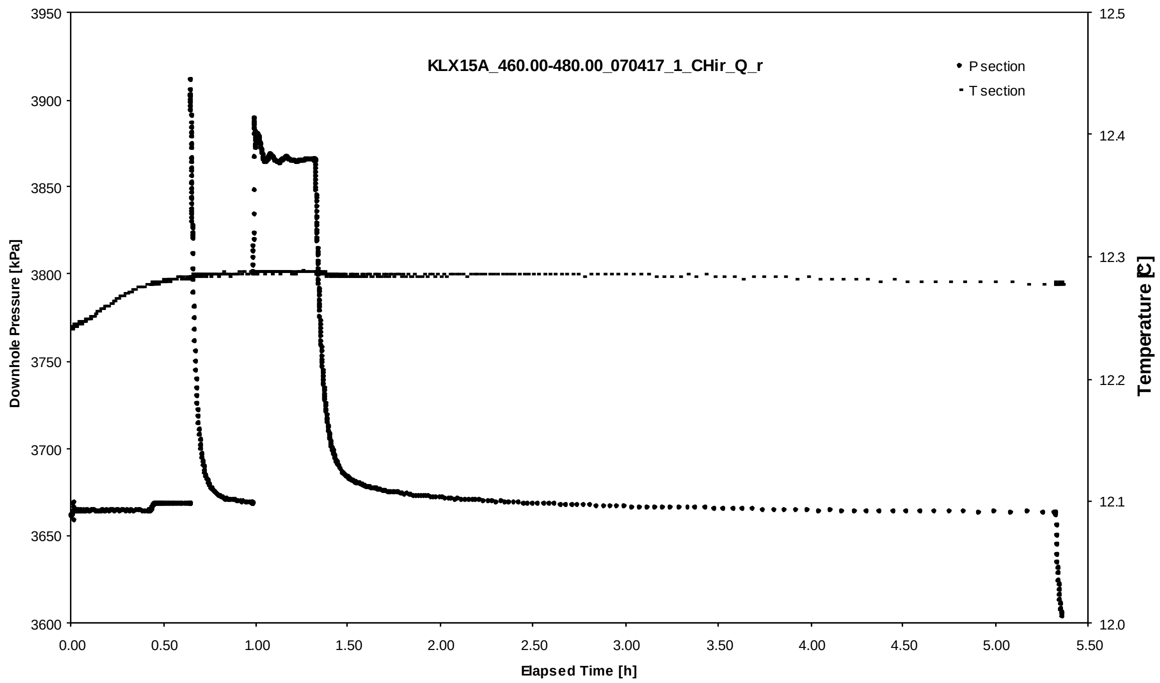
APPENDIX 2-28

Test 460.00 – 480.00 m

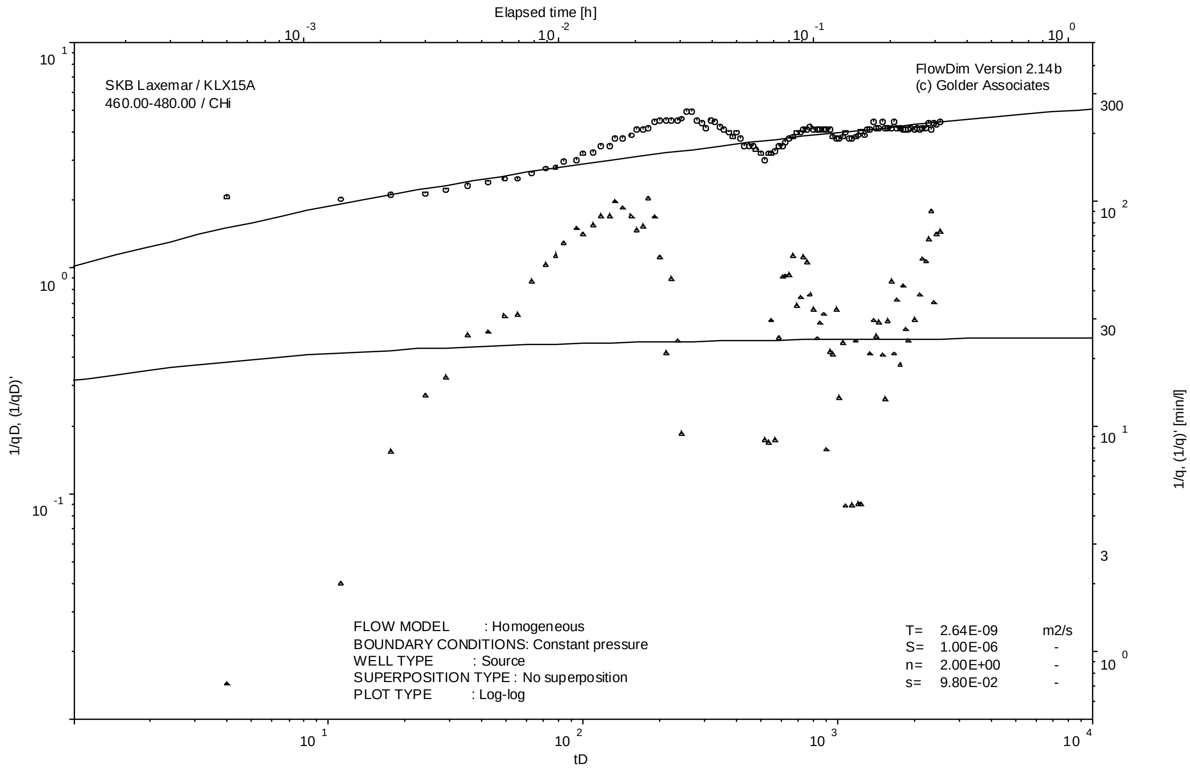
Analysis diagrams



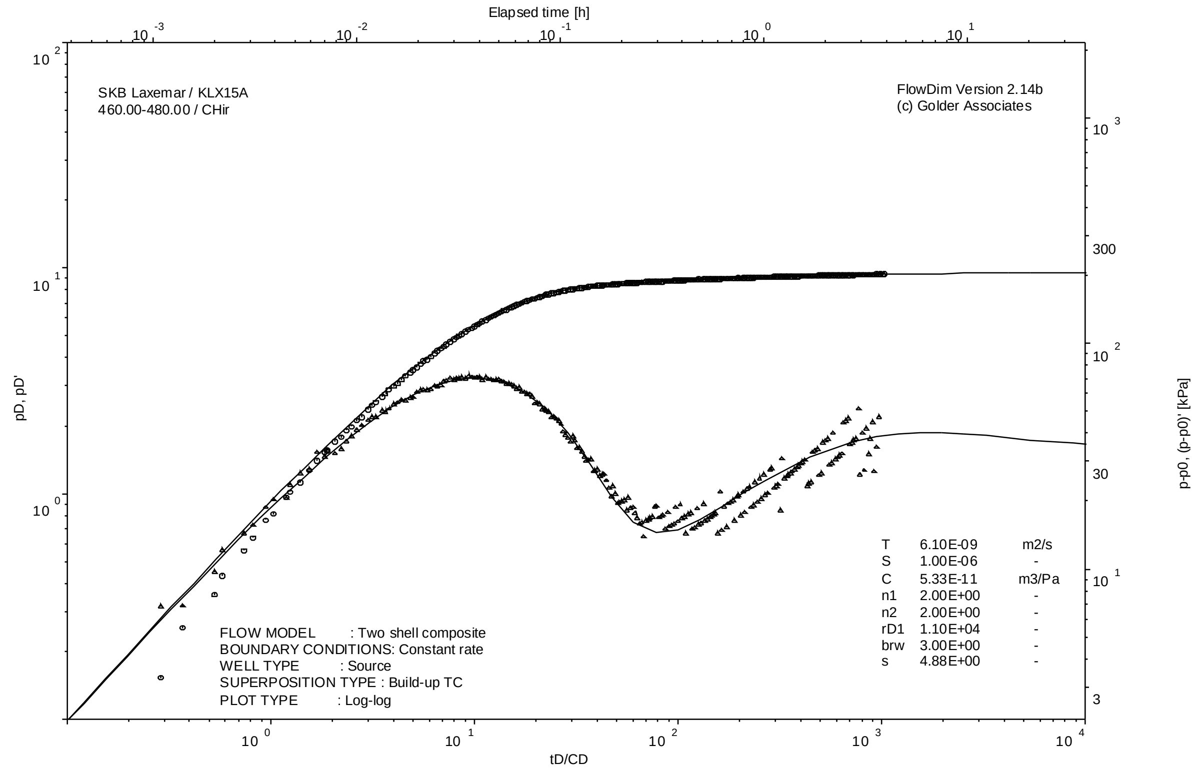
Pressure and flow rate vs. time; cartesian plot



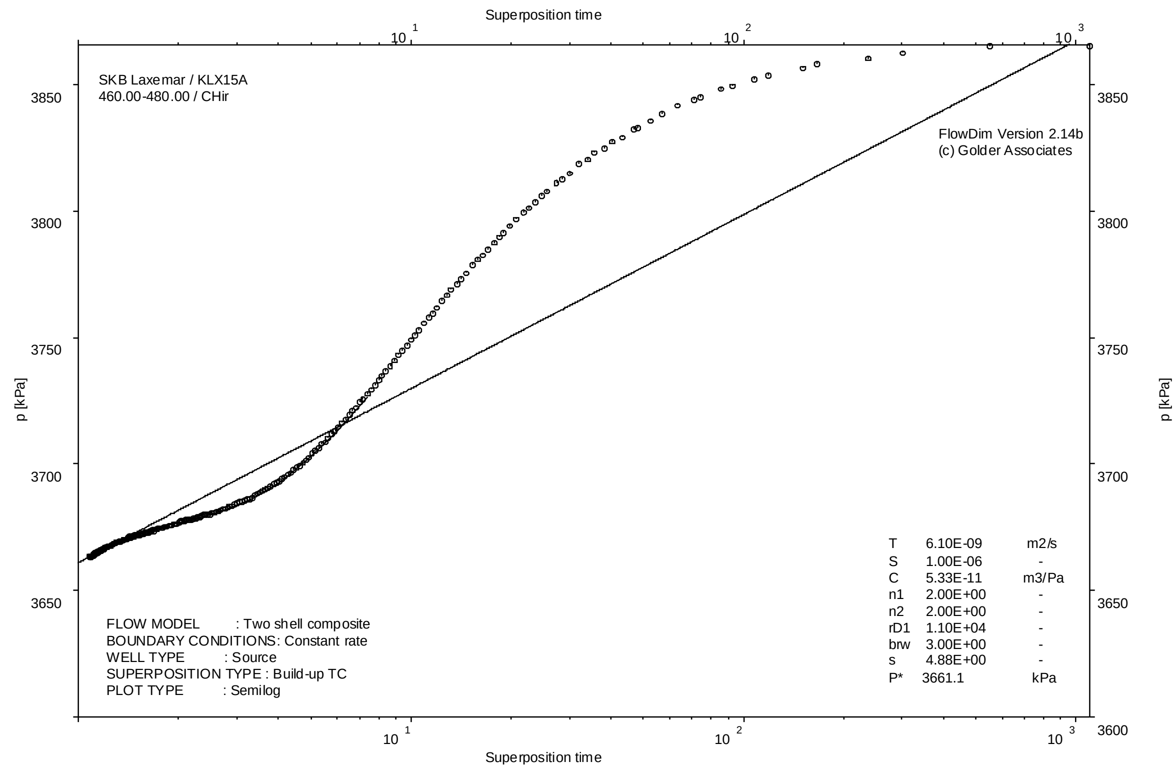
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

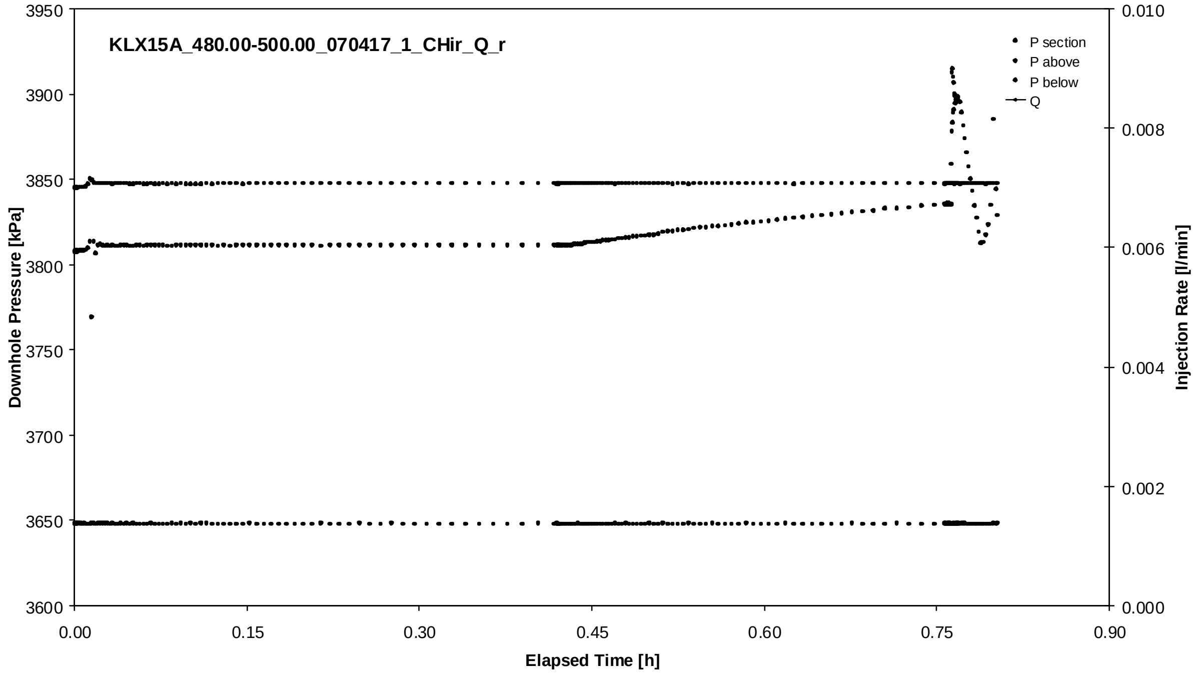


CHIR phase; HORNER match

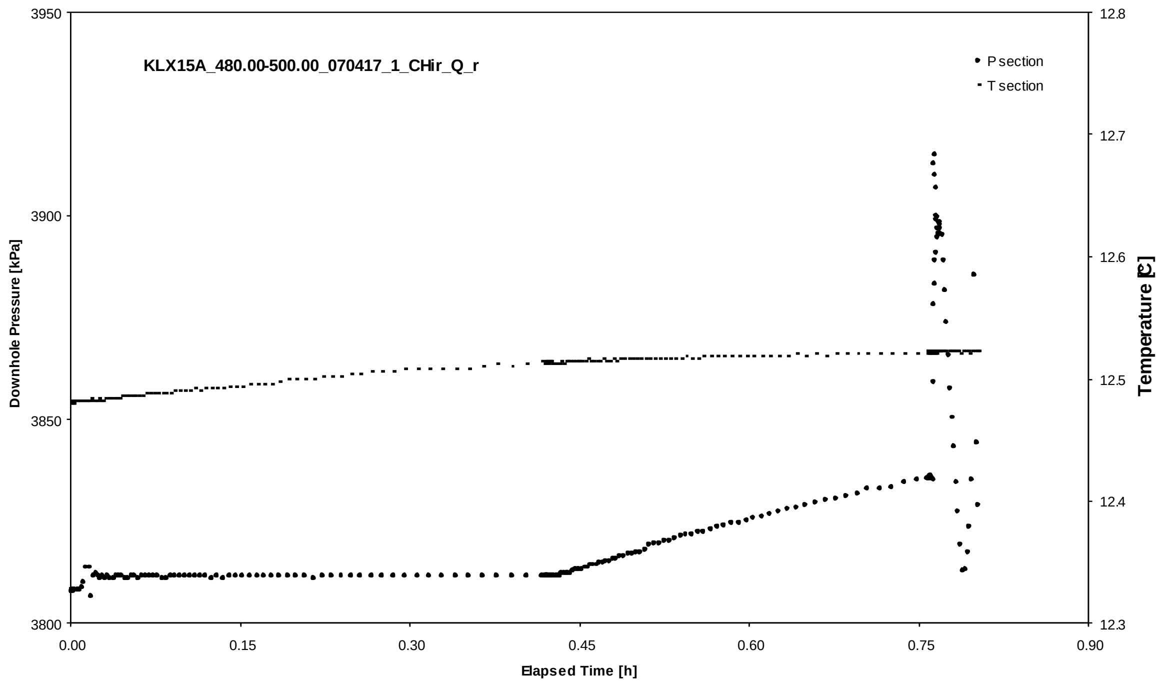
APPENDIX 2-29

Test 480.00 – 500.00 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

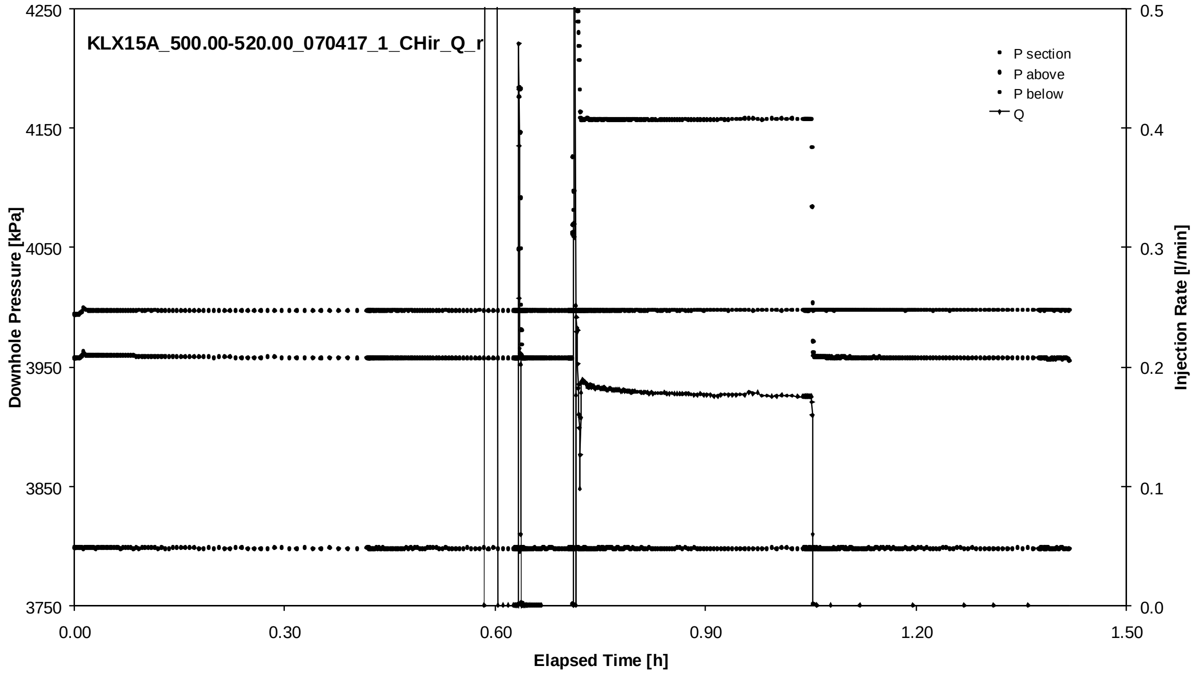
Not analysed

CHIR phase; HORNER match

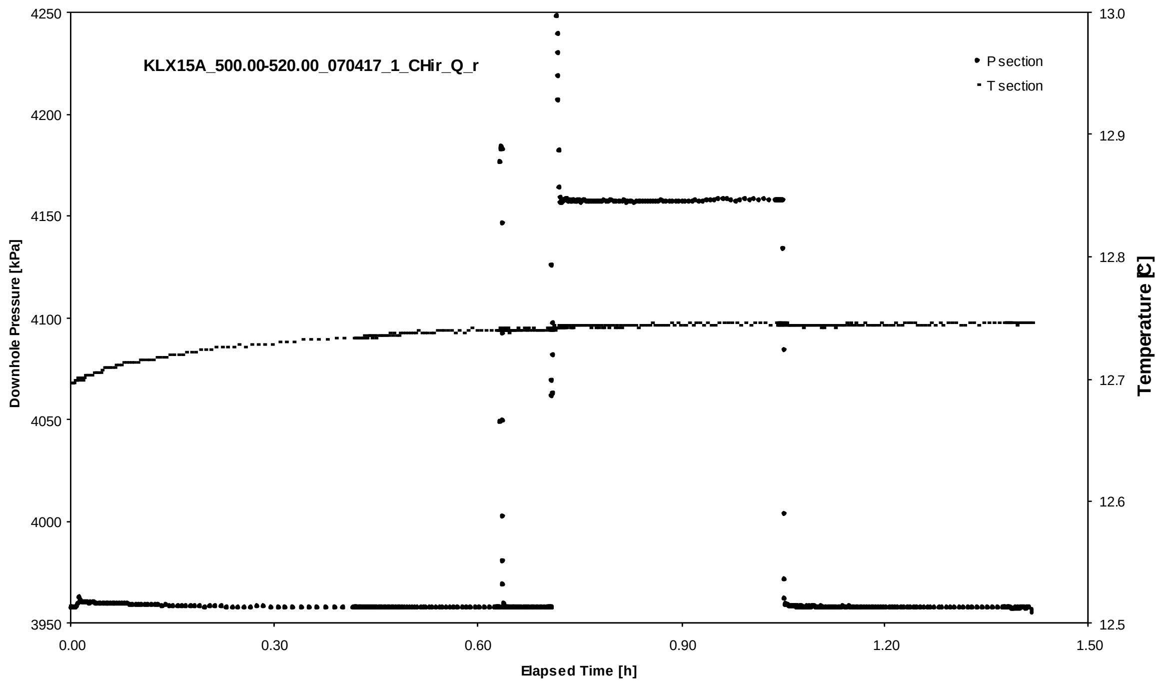
APPENDIX 2-30

Test 500.00 – 520.00 m

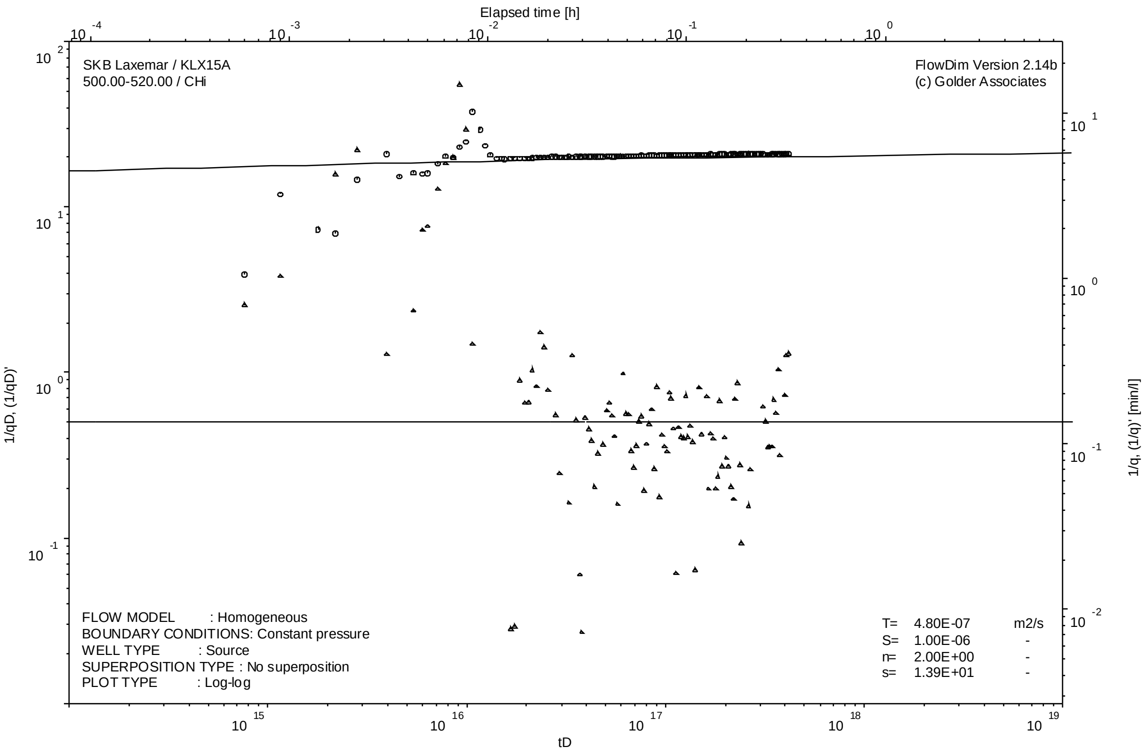
Analysis diagrams



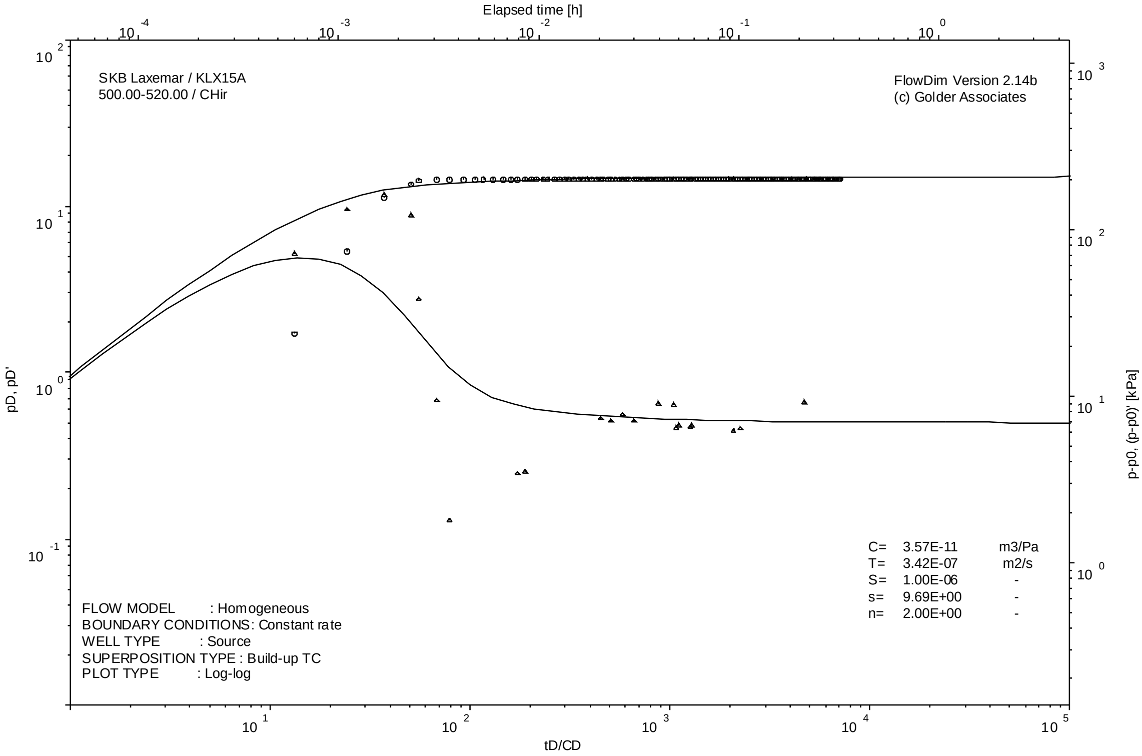
Pressure and flow rate vs. time; cartesian plot



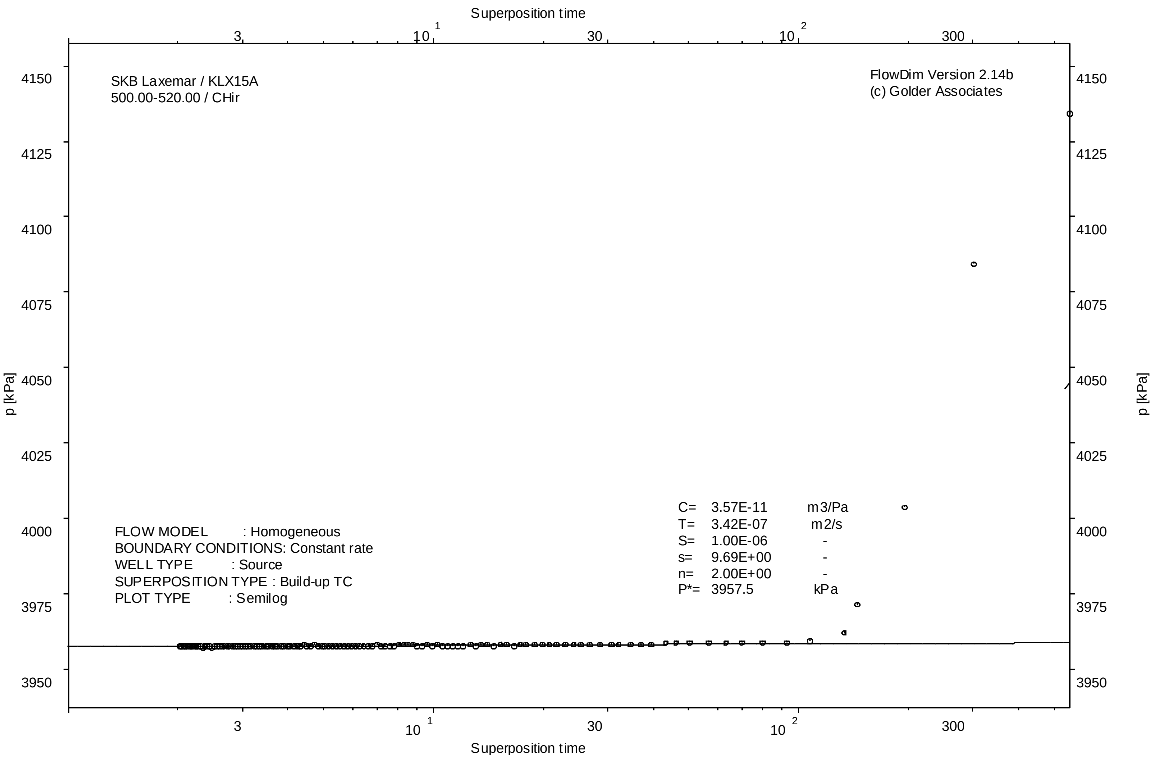
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

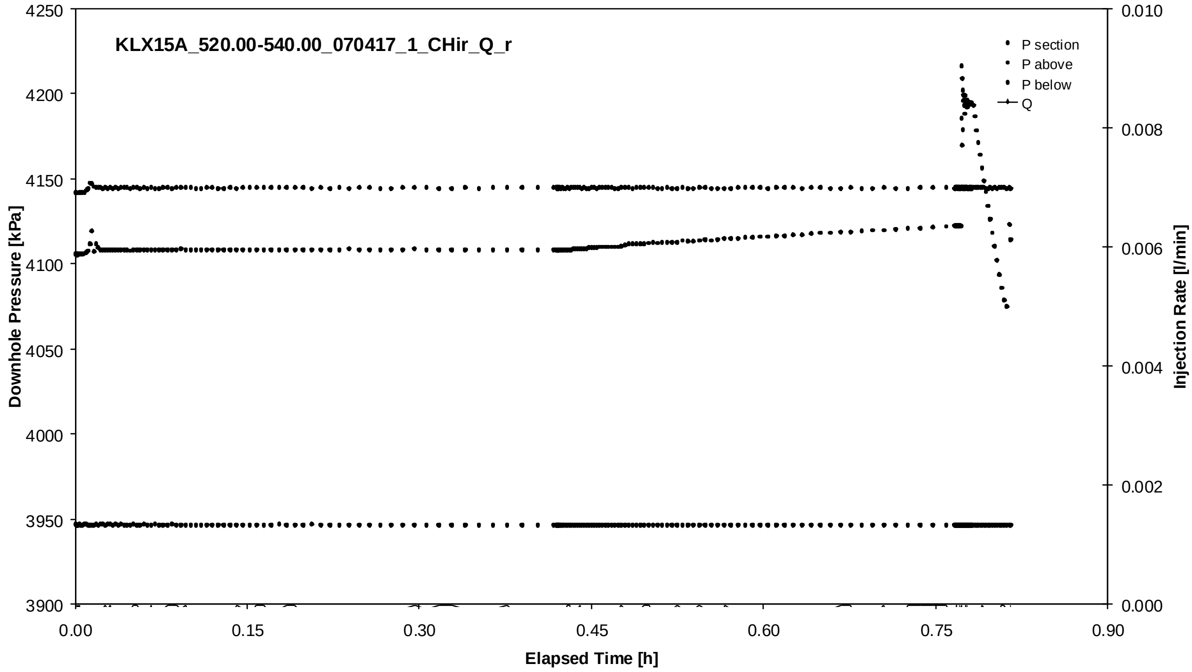


CHIR phase; HORNER match

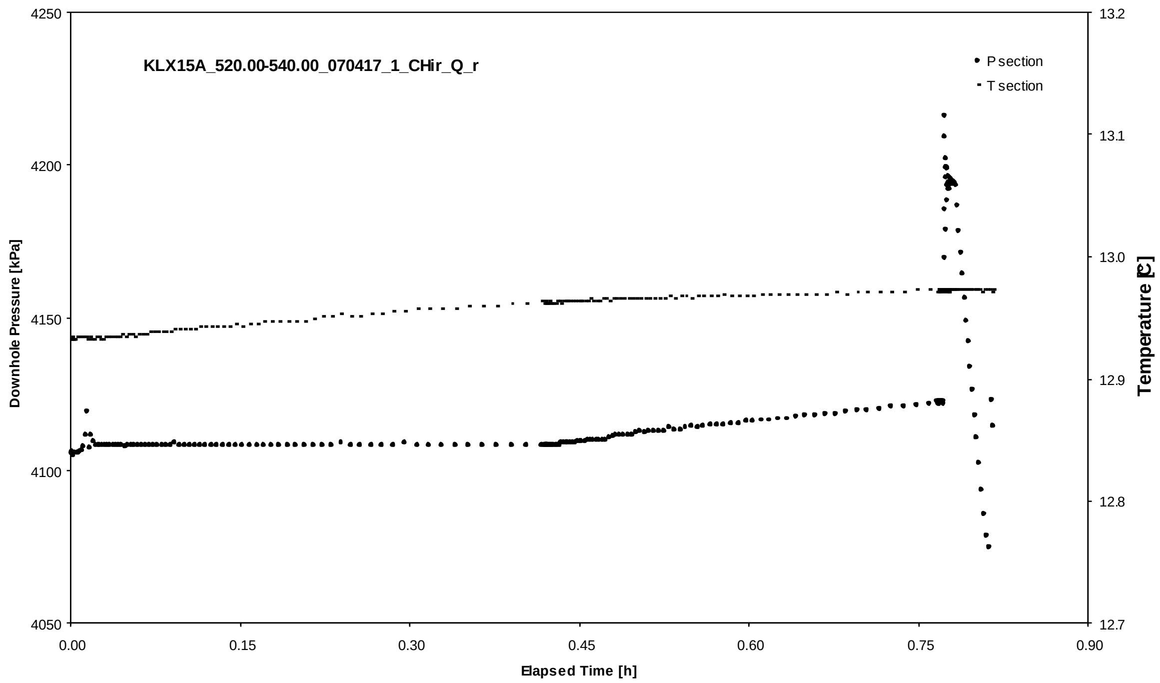
APPENDIX 2-31

Test 520.00 – 540.00 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

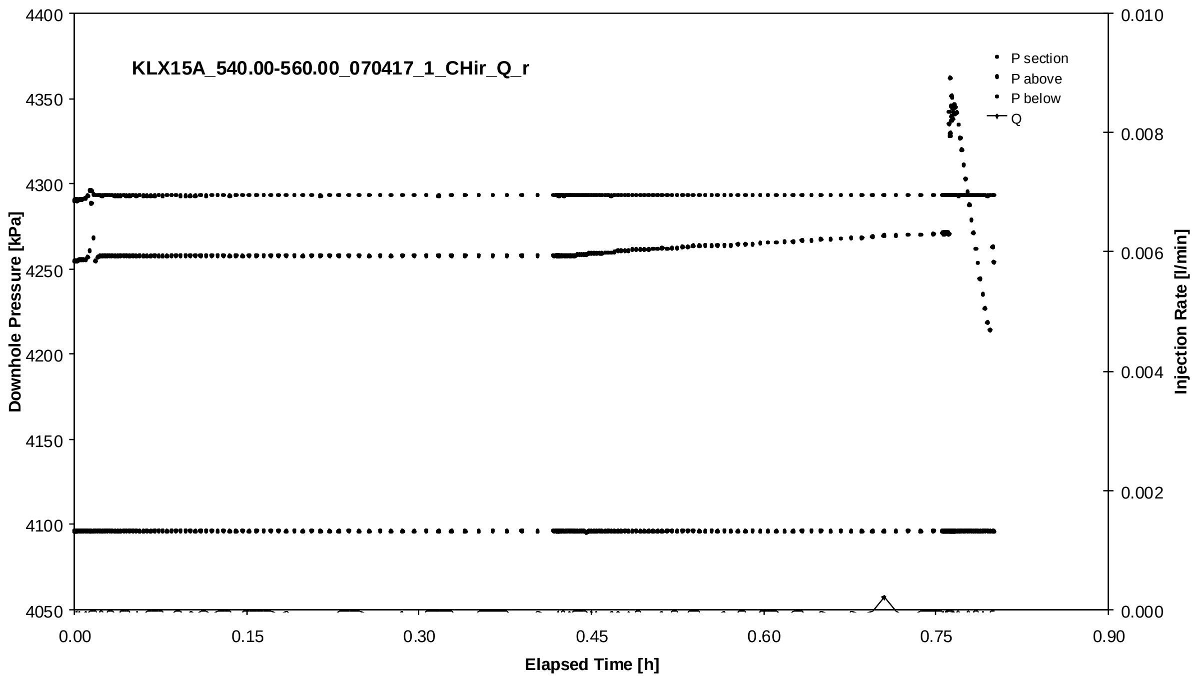
Not analysed

CHIR phase; HORNER match

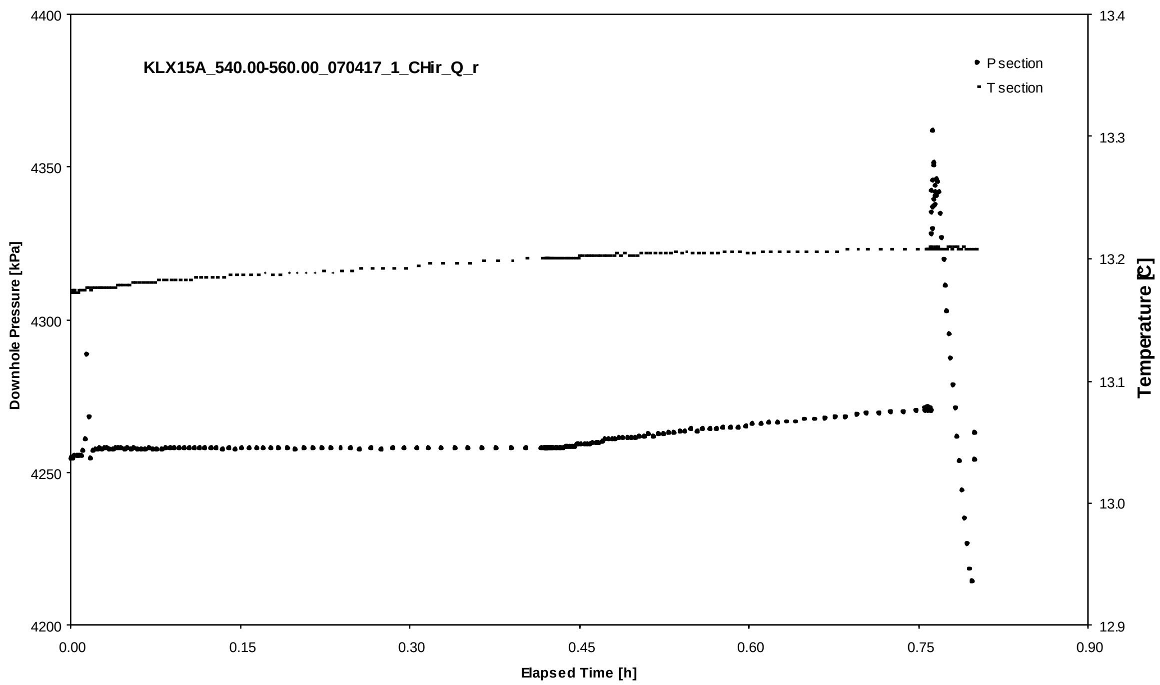
APPENDIX 2-32

Test 540.00 – 560.00 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

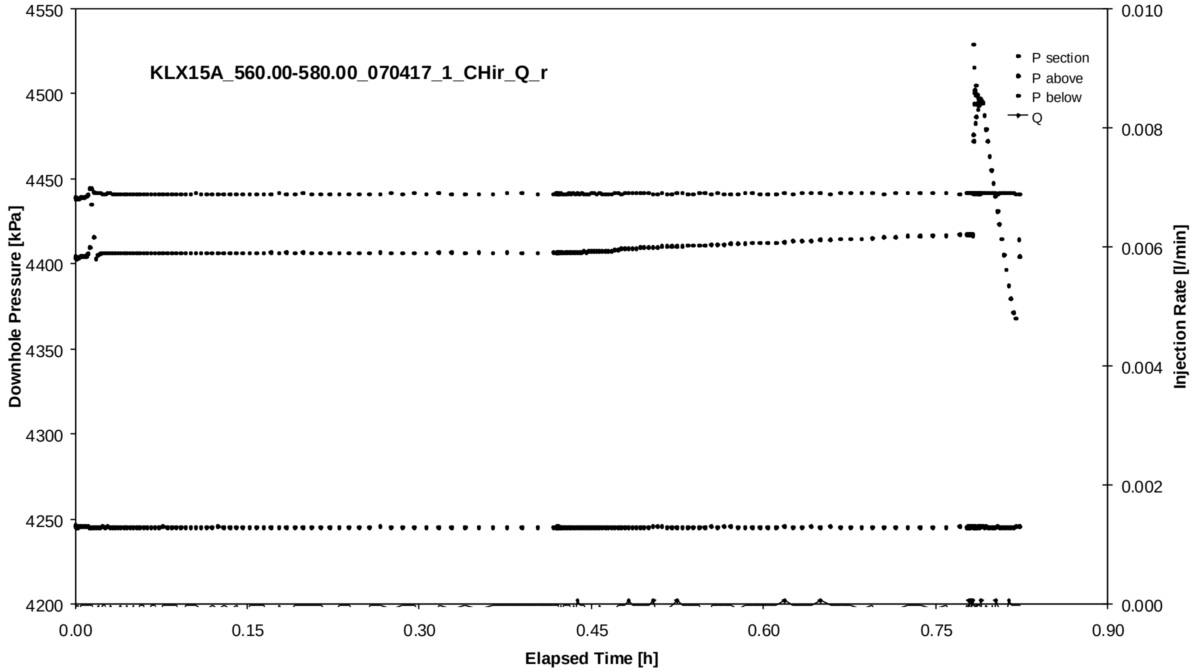
Not analysed

CHIR phase; HORNER match

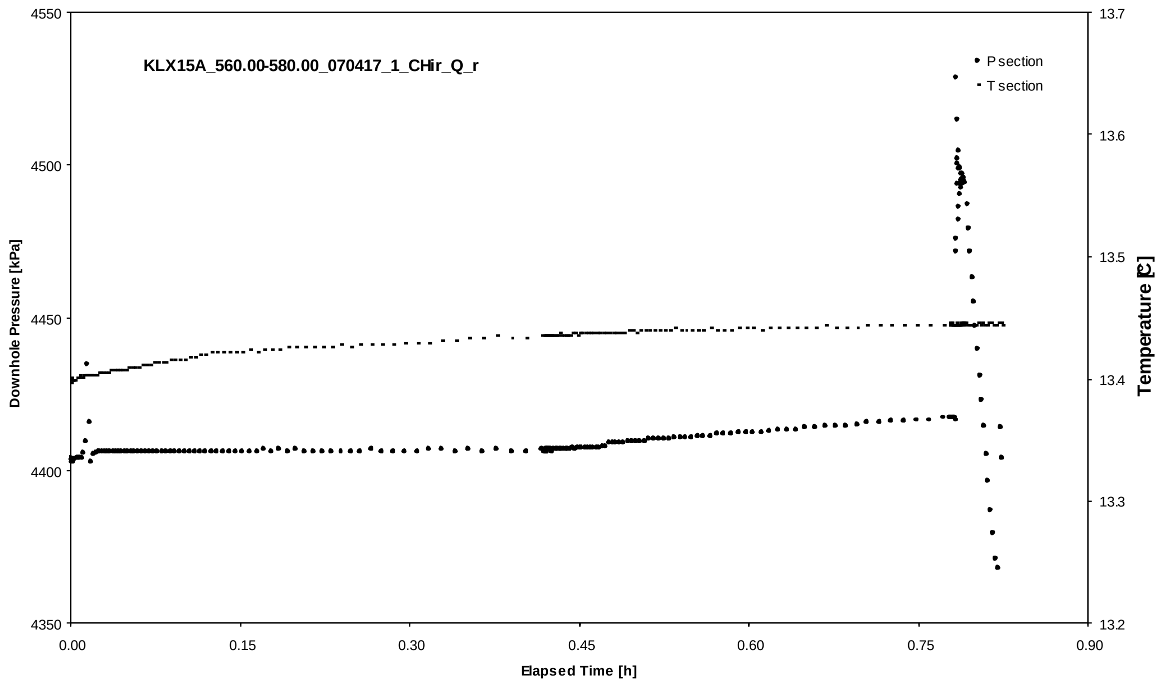
APPENDIX 2-33

Test 560.00 – 580.00 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

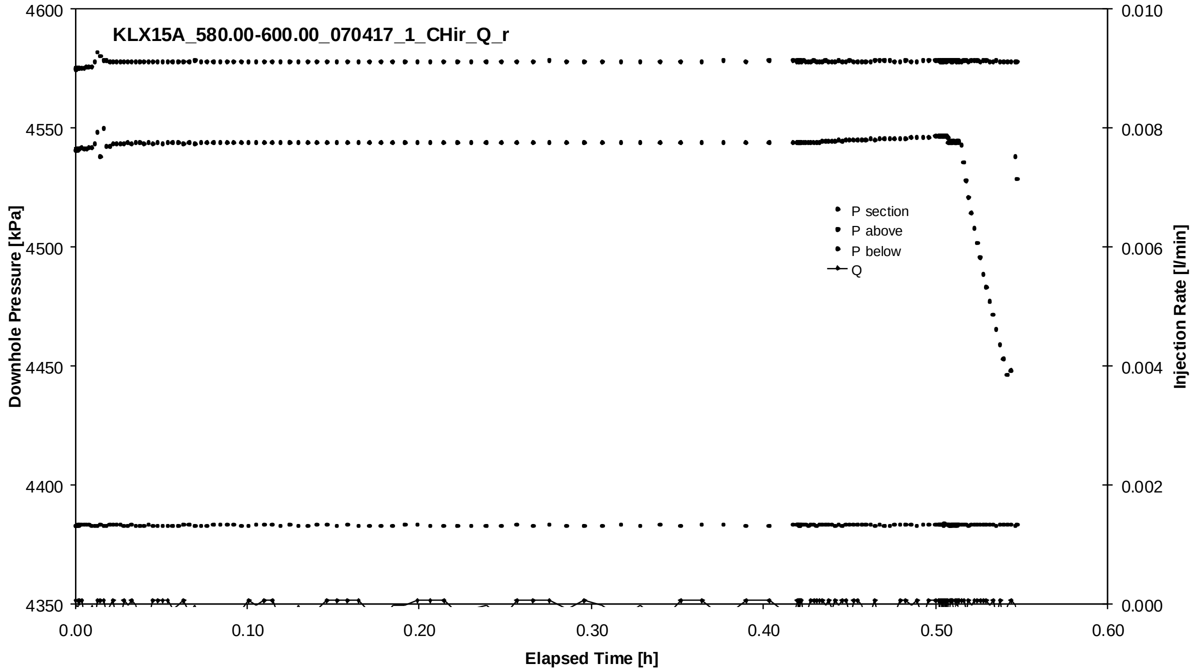
Not analysed

CHIR phase; HORNER match

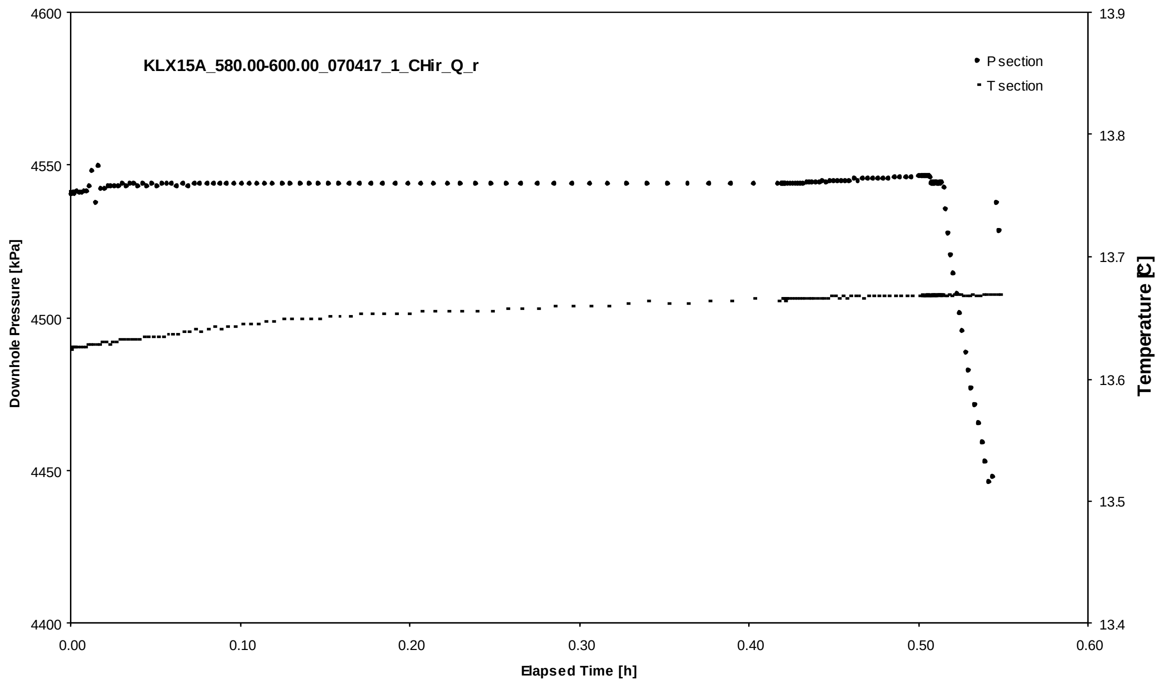
APPENDIX 2-34

Test 580.00 – 600.00 m

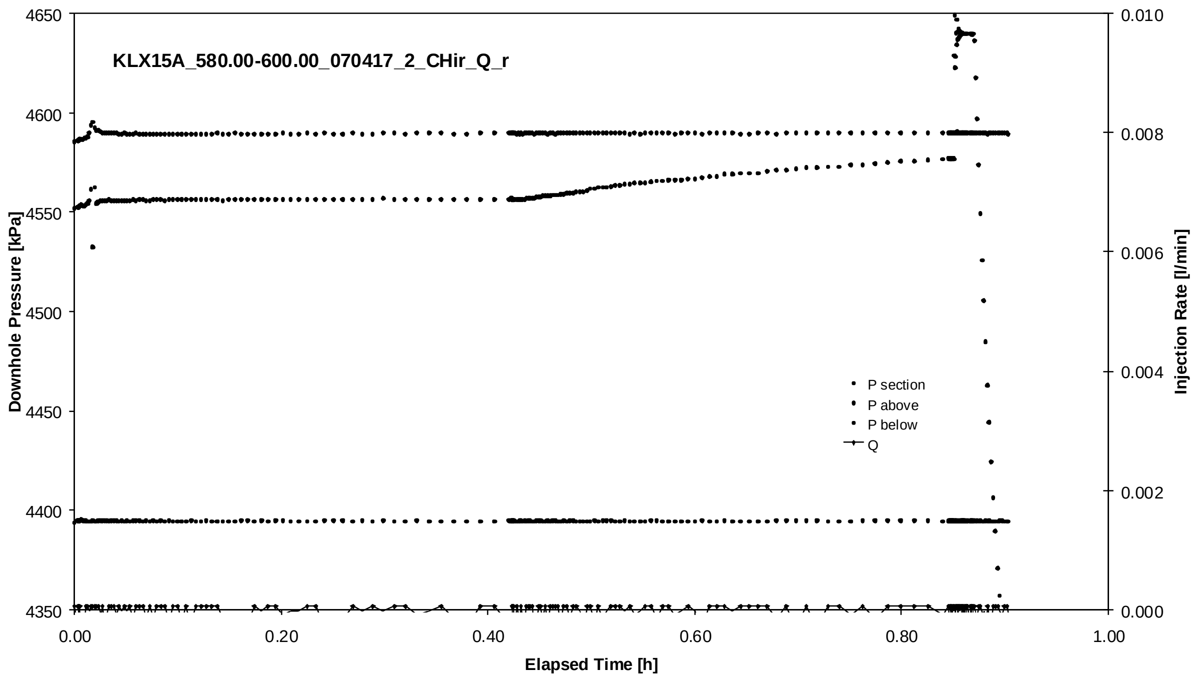
Analysis diagrams



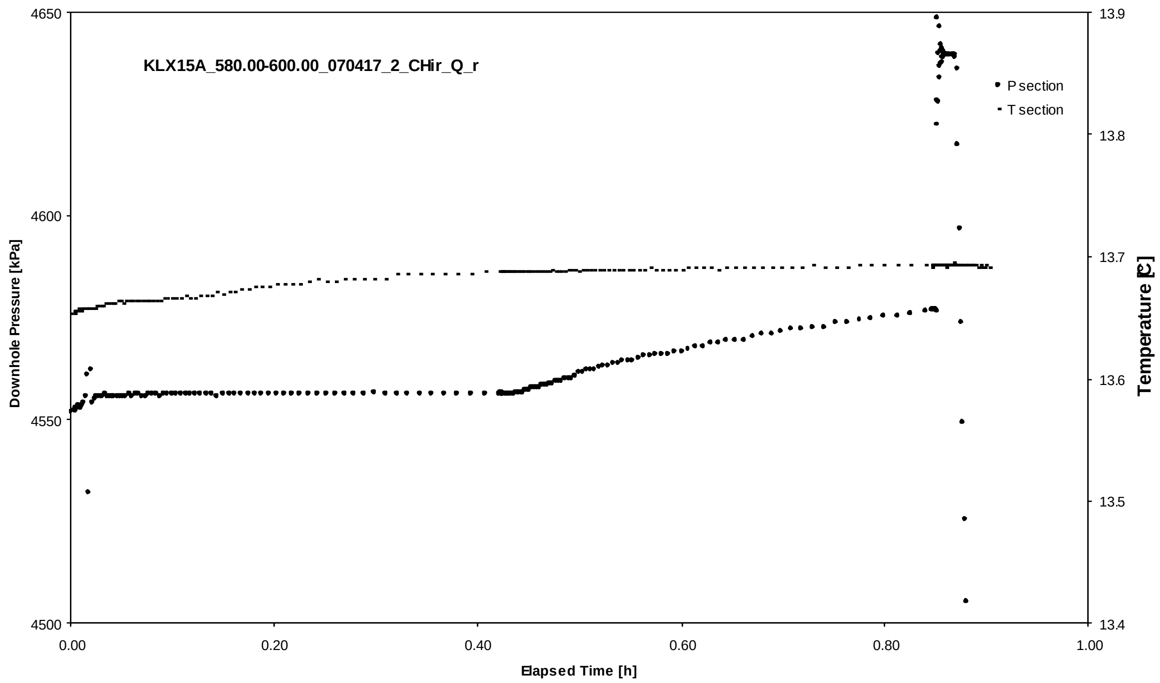
Pressure and flow rate vs. time; cartesian plot (repeated)



Interval pressure and temperature vs. time; cartesian plot (repeated)



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

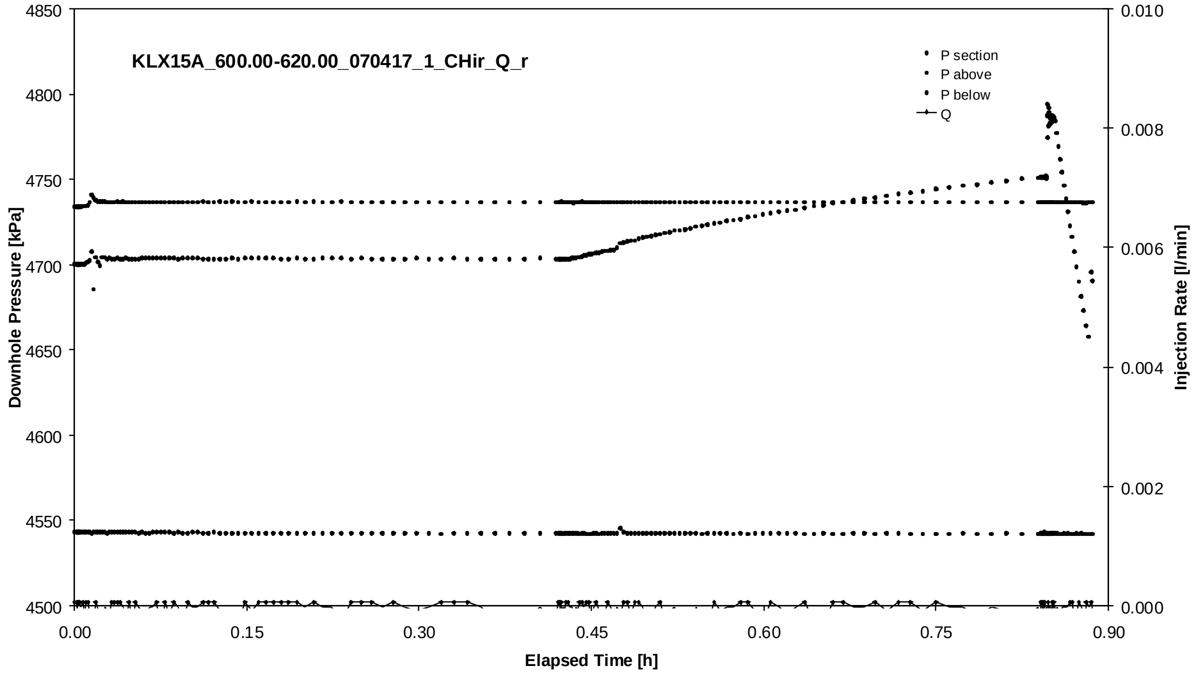
Not analysed

CHIR phase; HORNER match

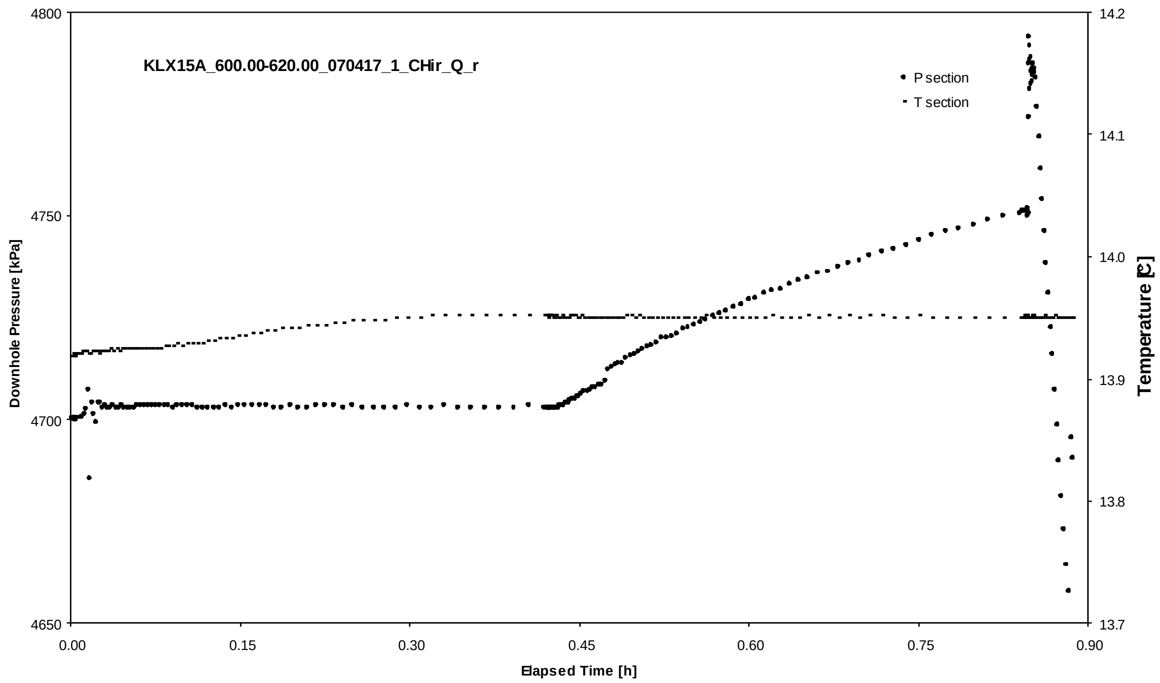
APPENDIX 2-35

Test 600.00 – 620.00 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

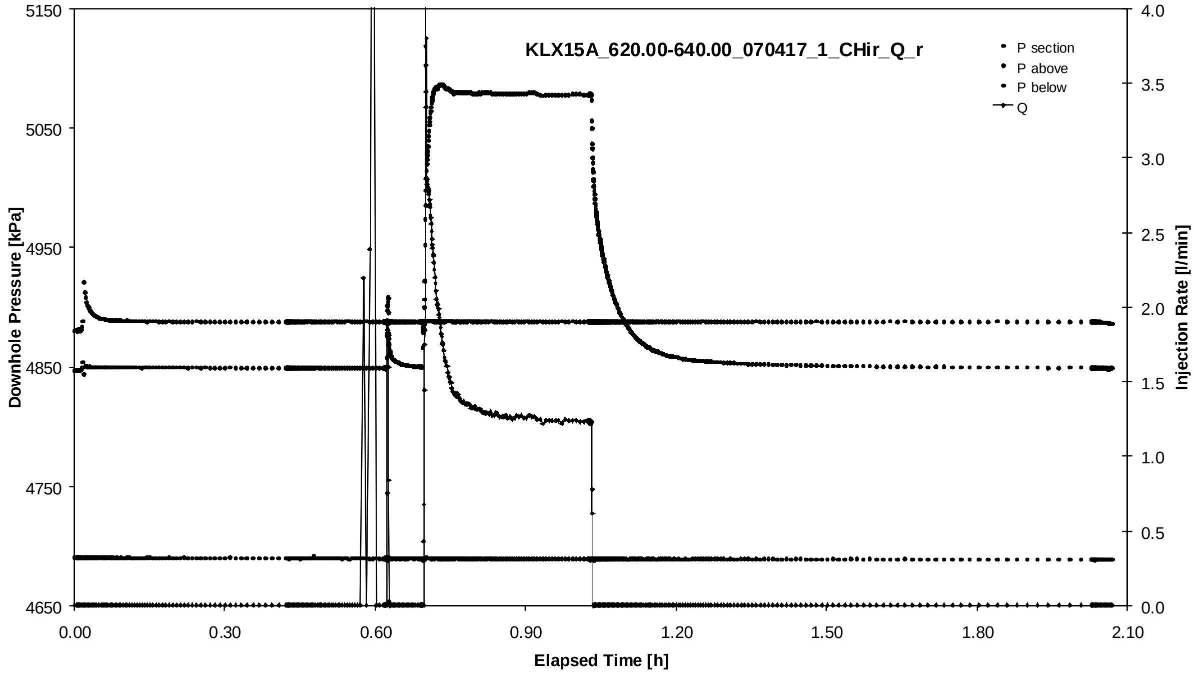
Not analysed

CHIR phase; HORNER match

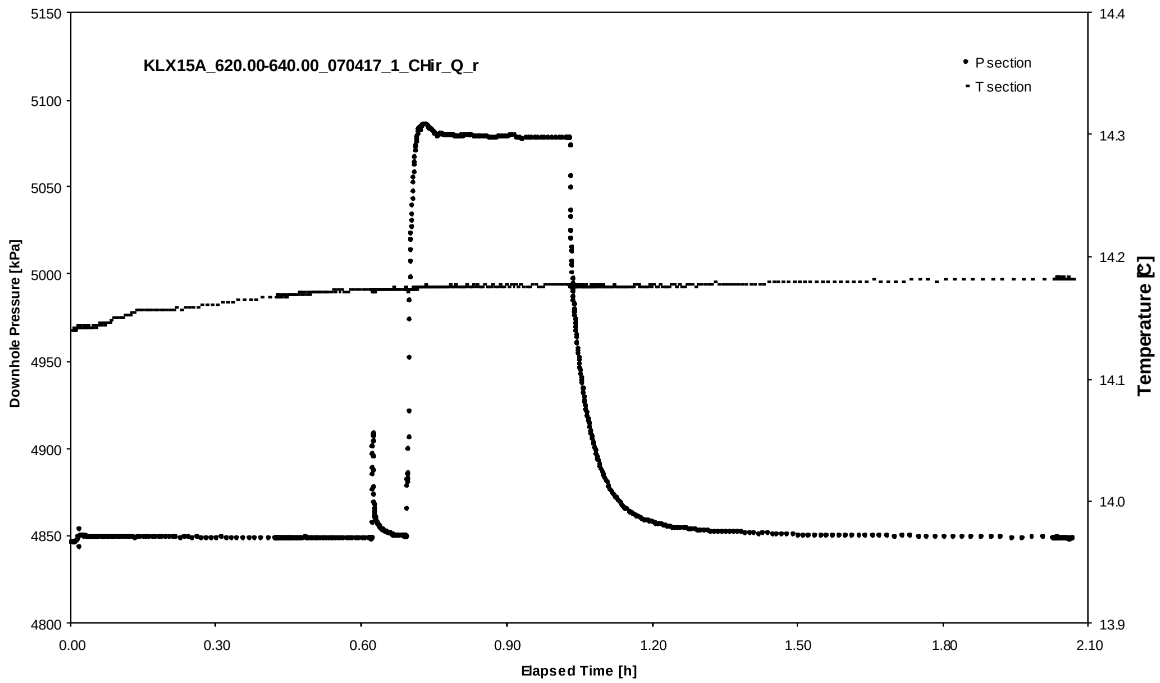
APPENDIX 2-36

Test 620.00 – 640.00 m

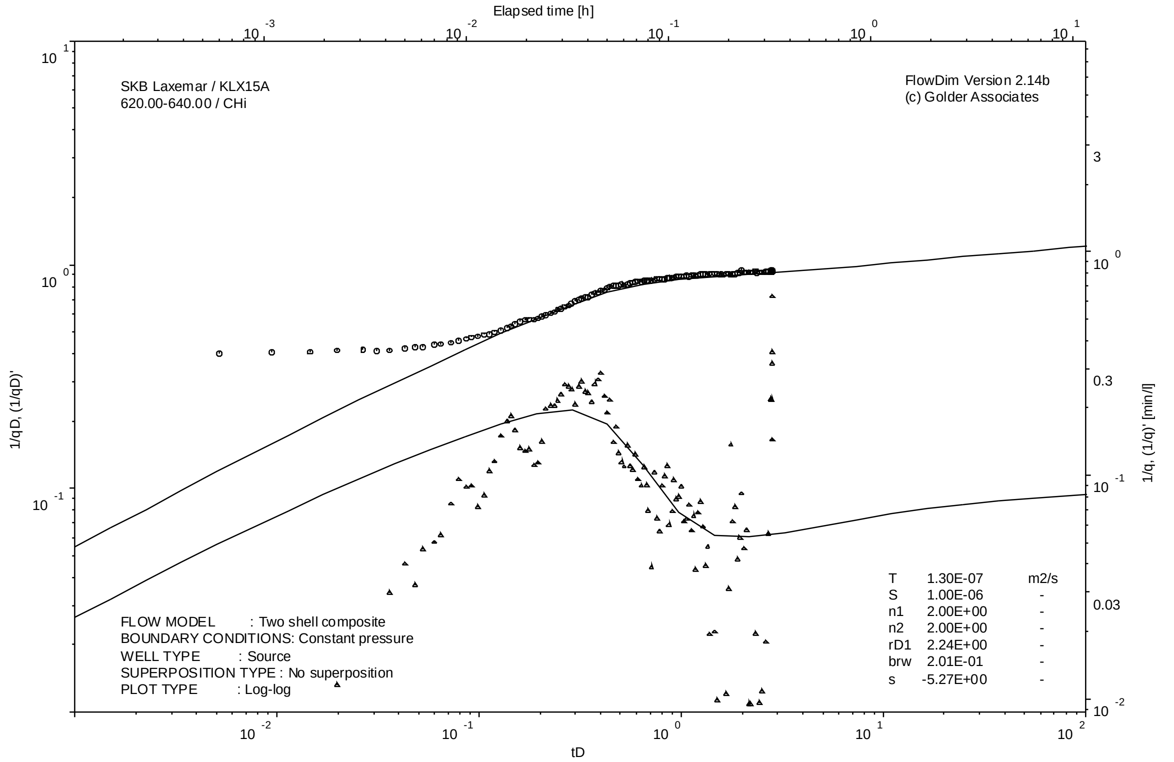
Analysis diagrams



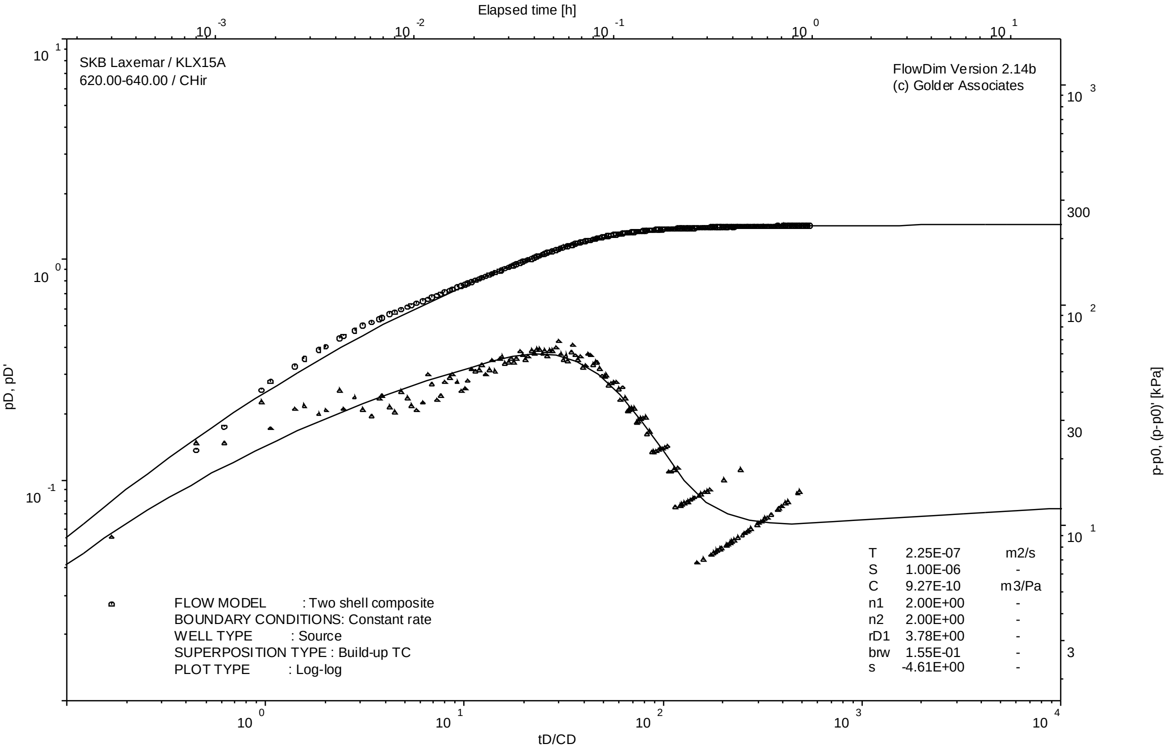
Pressure and flow rate vs. time; cartesian plot



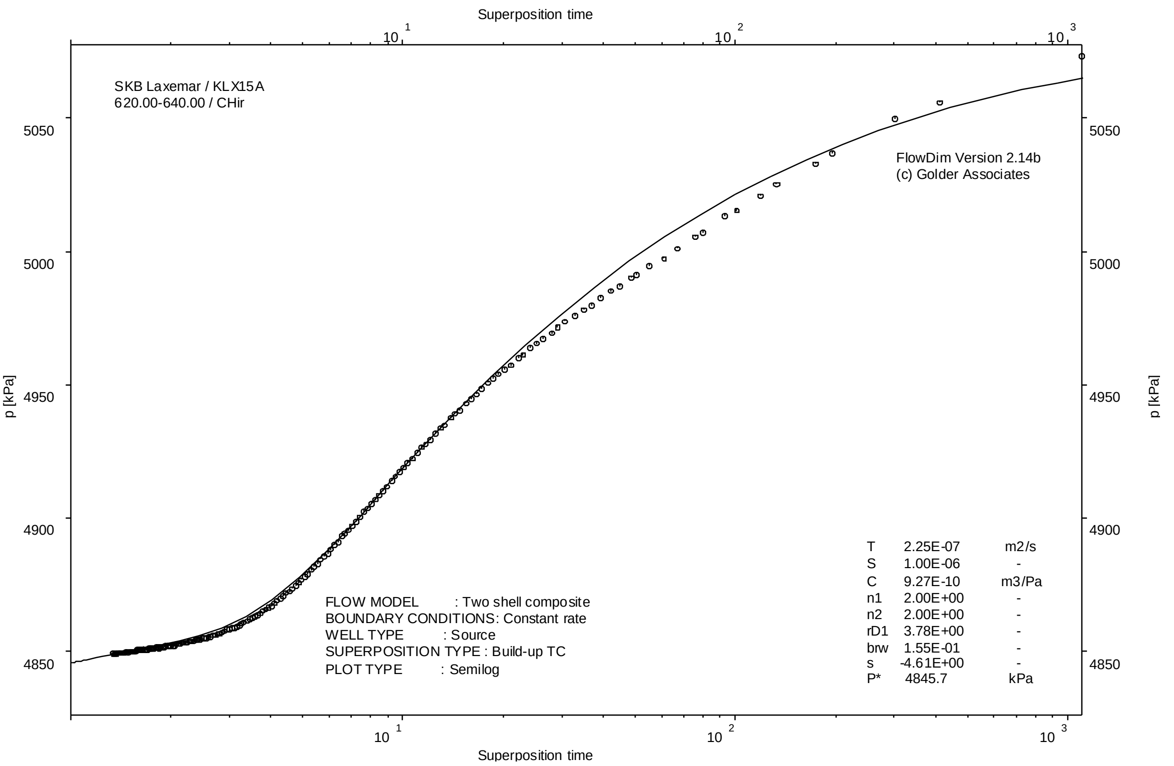
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

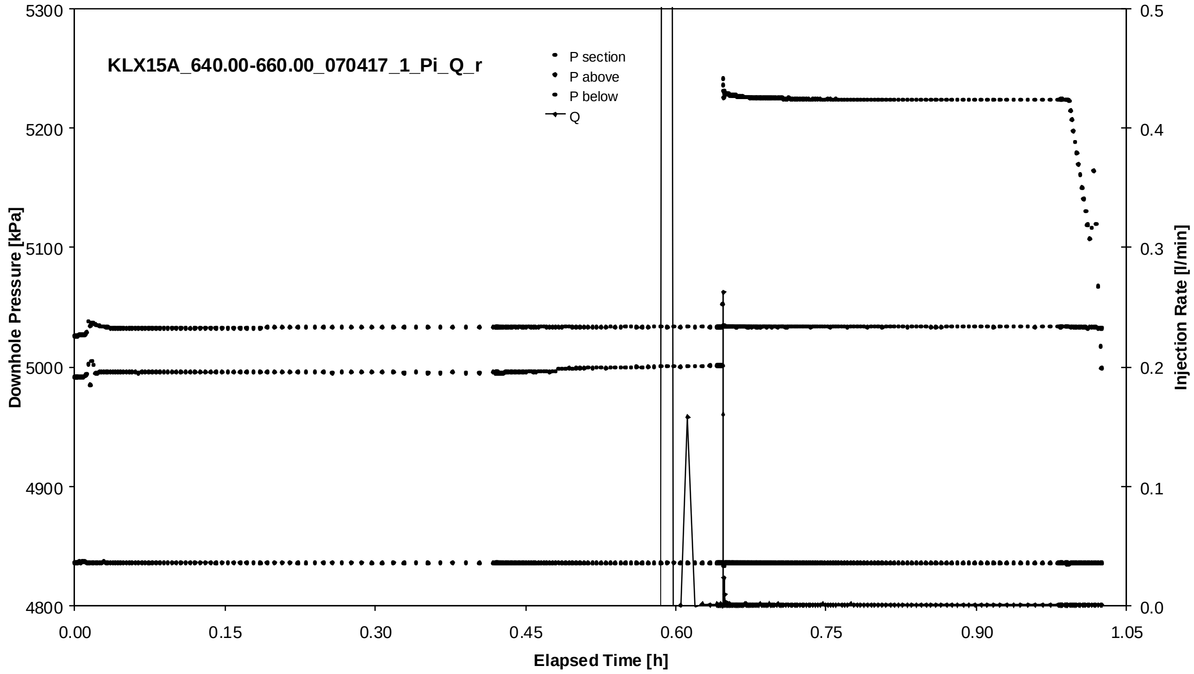


CHIR phase; HORNER match

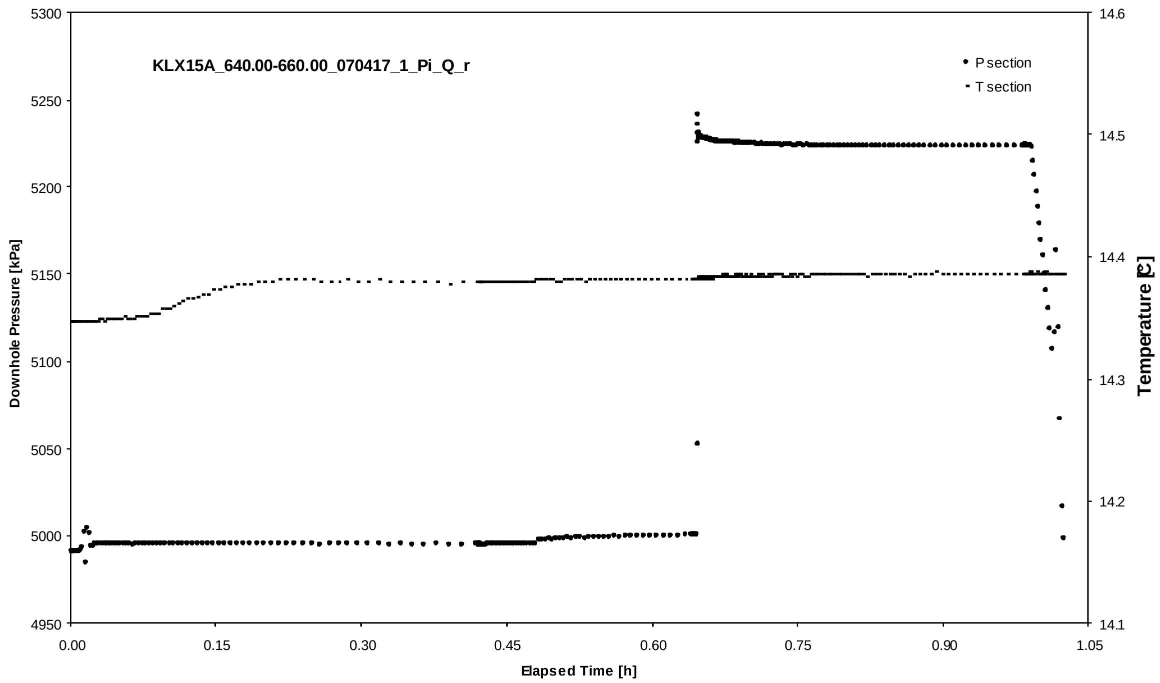
APPENDIX 2-37

Test 640.00 – 660.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

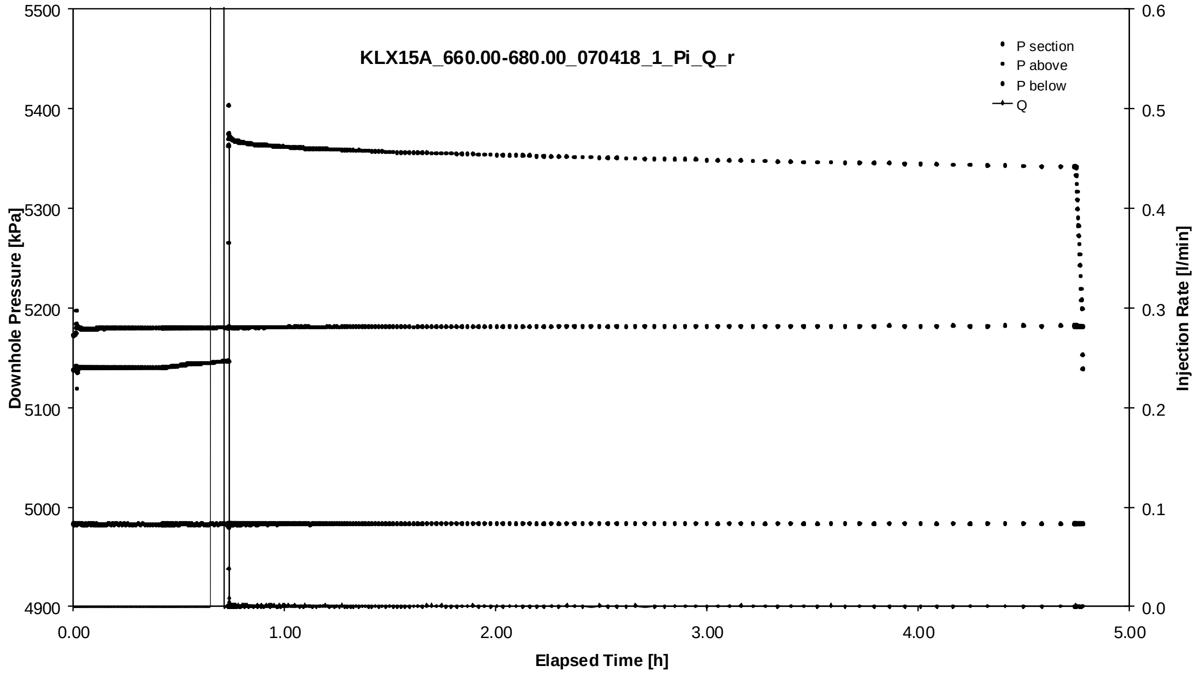
Not analysed

Pulse injection; deconvolution match

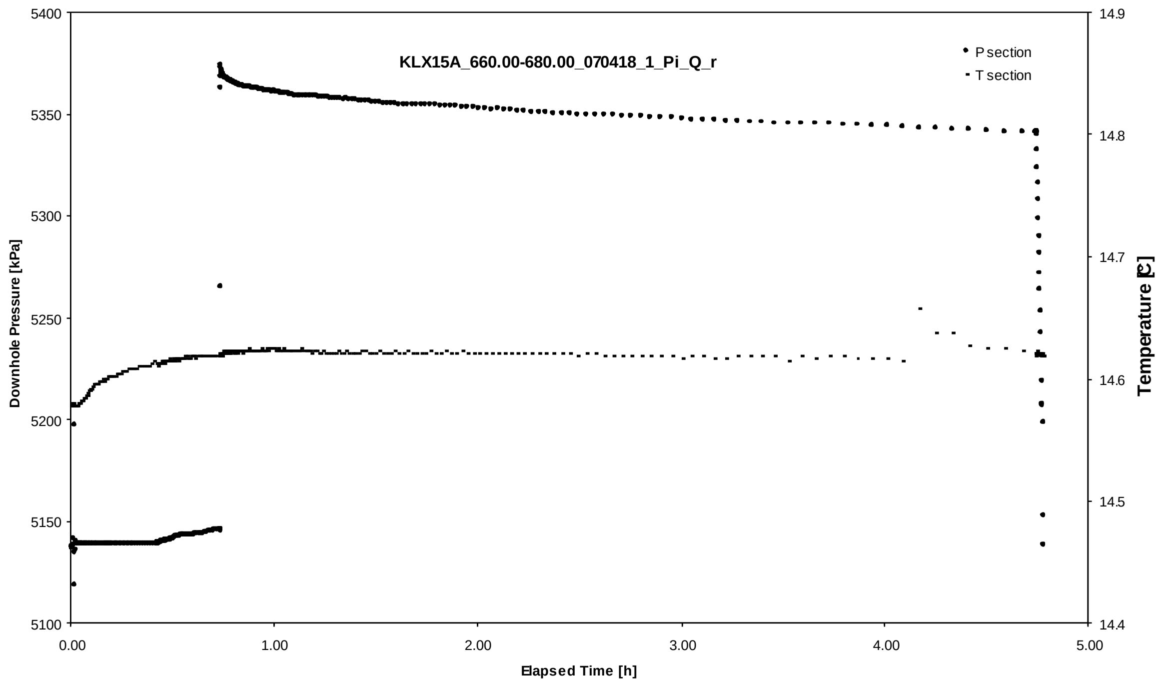
APPENDIX 2-38

Test 660.00 – 680.00 m

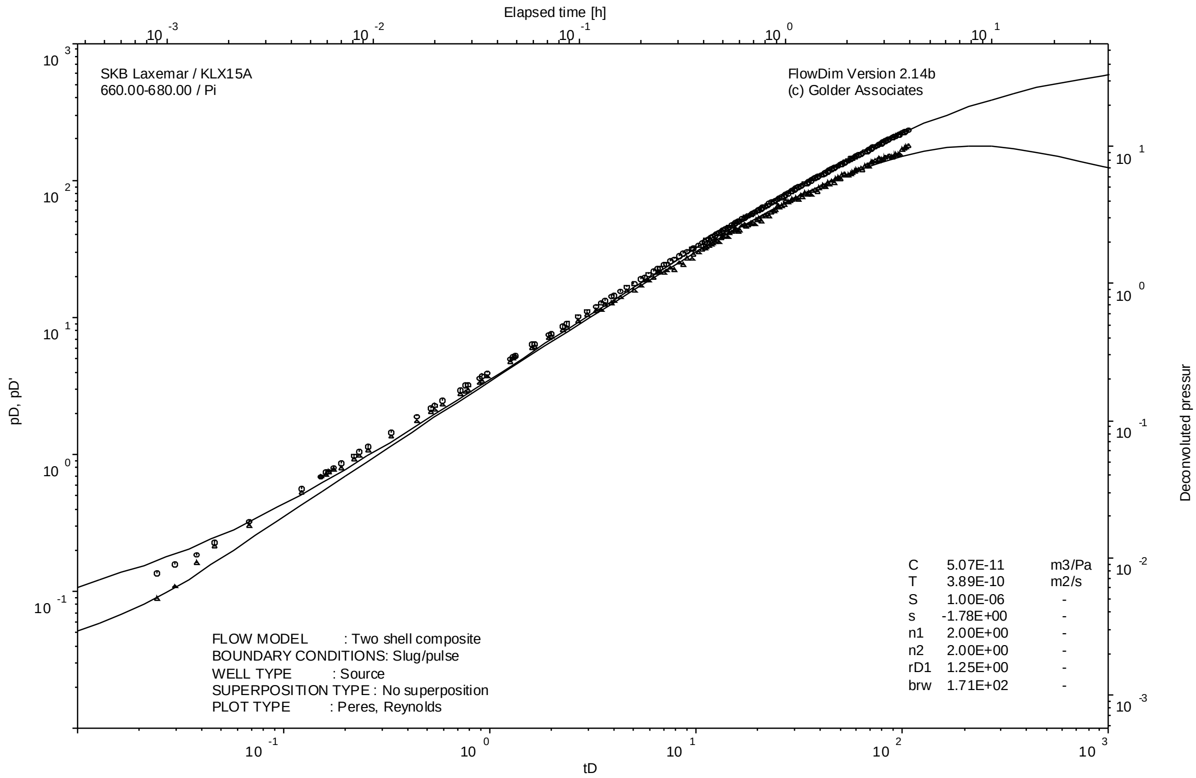
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

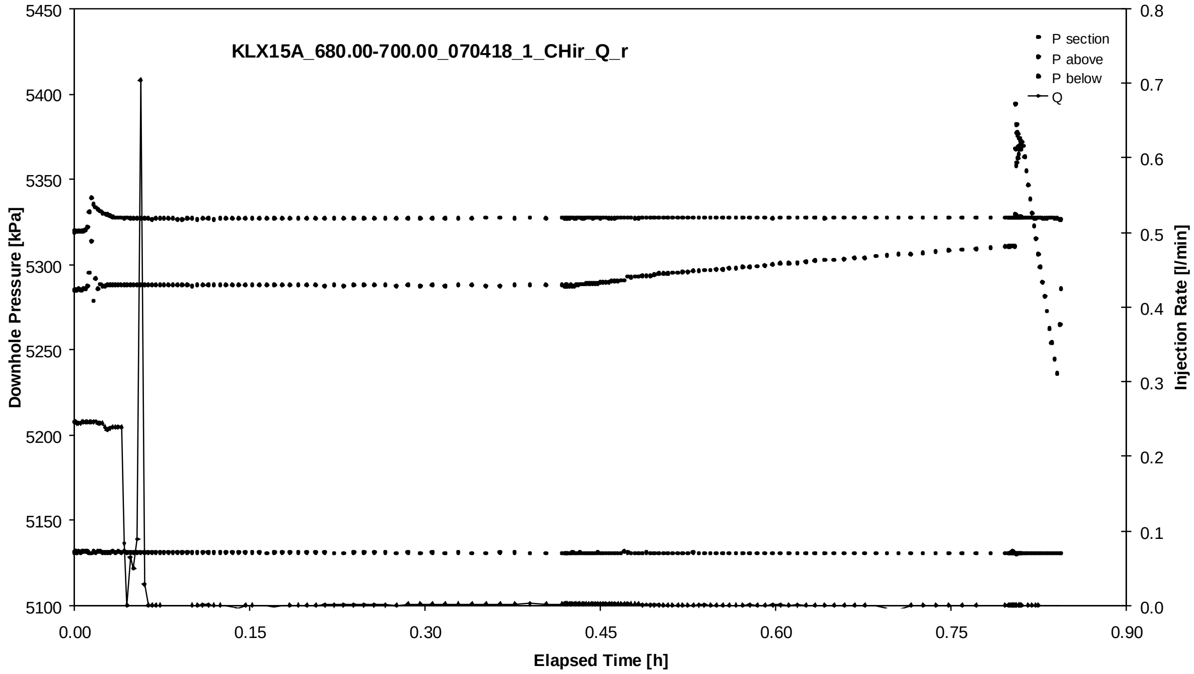


Pulse injection; deconvolution match

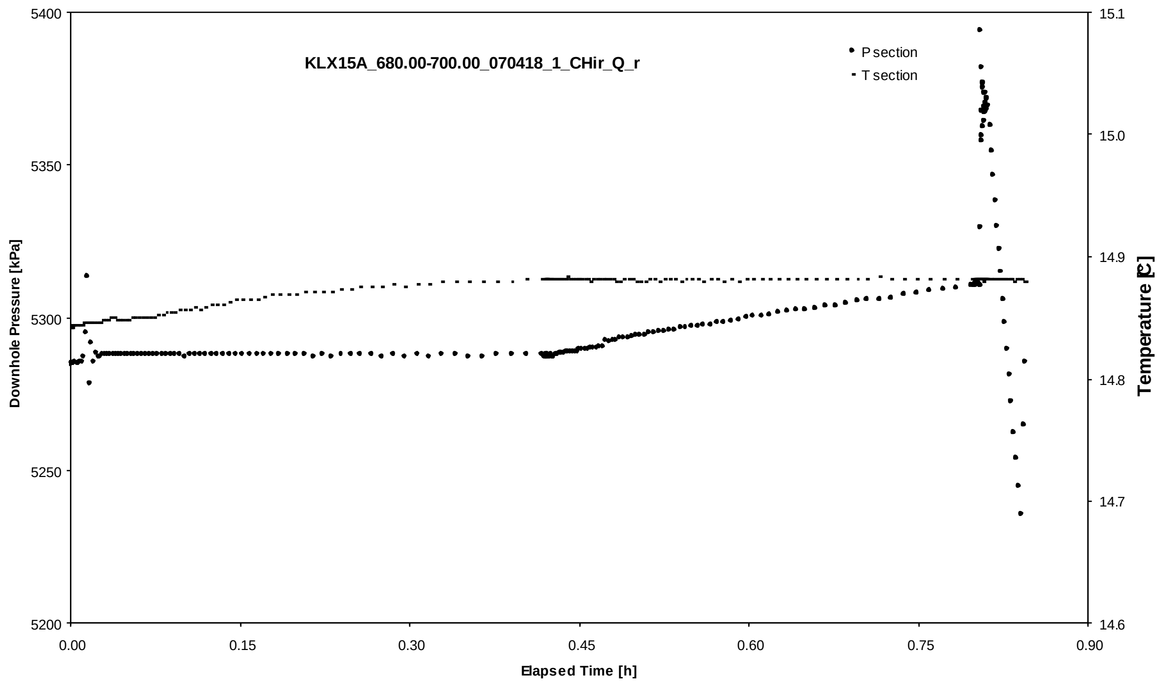
APPENDIX 2-39

Test 680.00 – 700.00 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

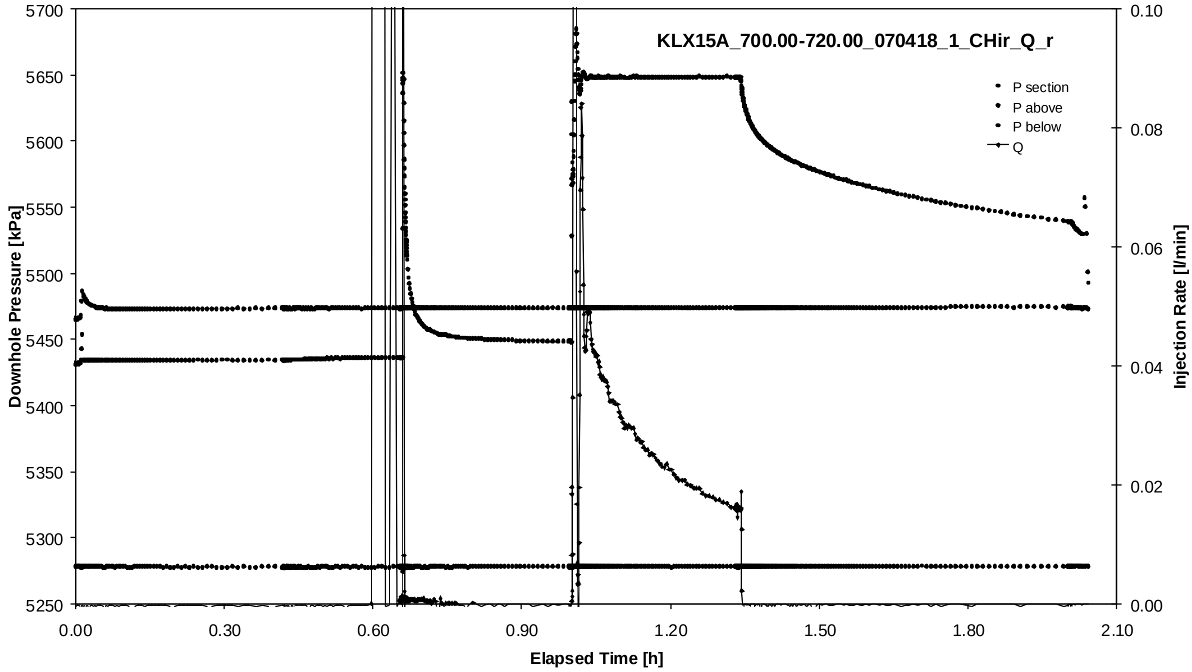
Not analysed

CHIR phase; HORNER match

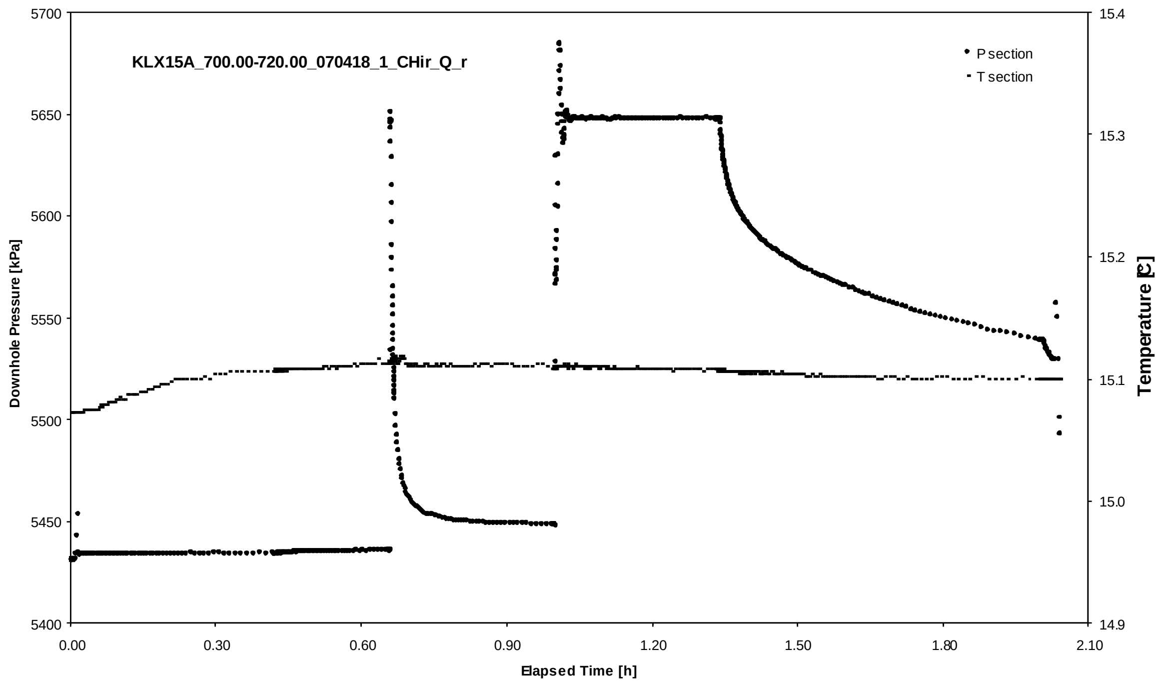
APPENDIX 2-40

Test 700.00 – 720.00 m

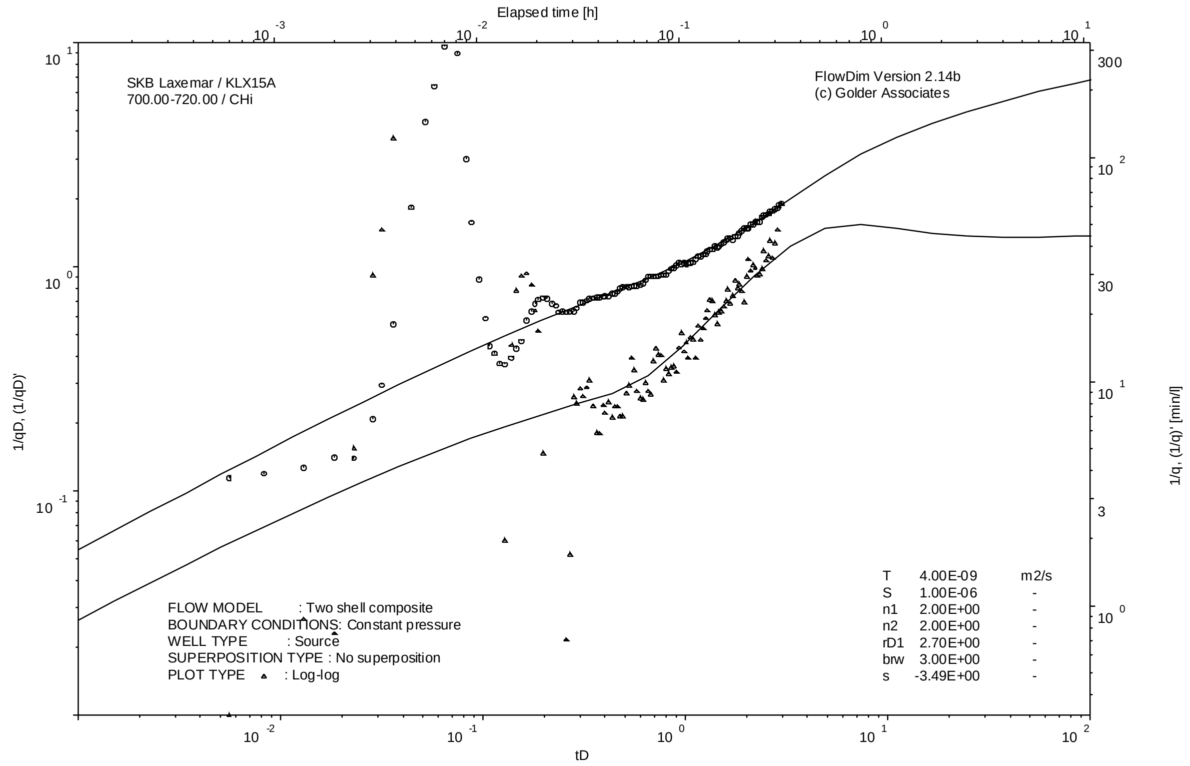
Analysis diagrams



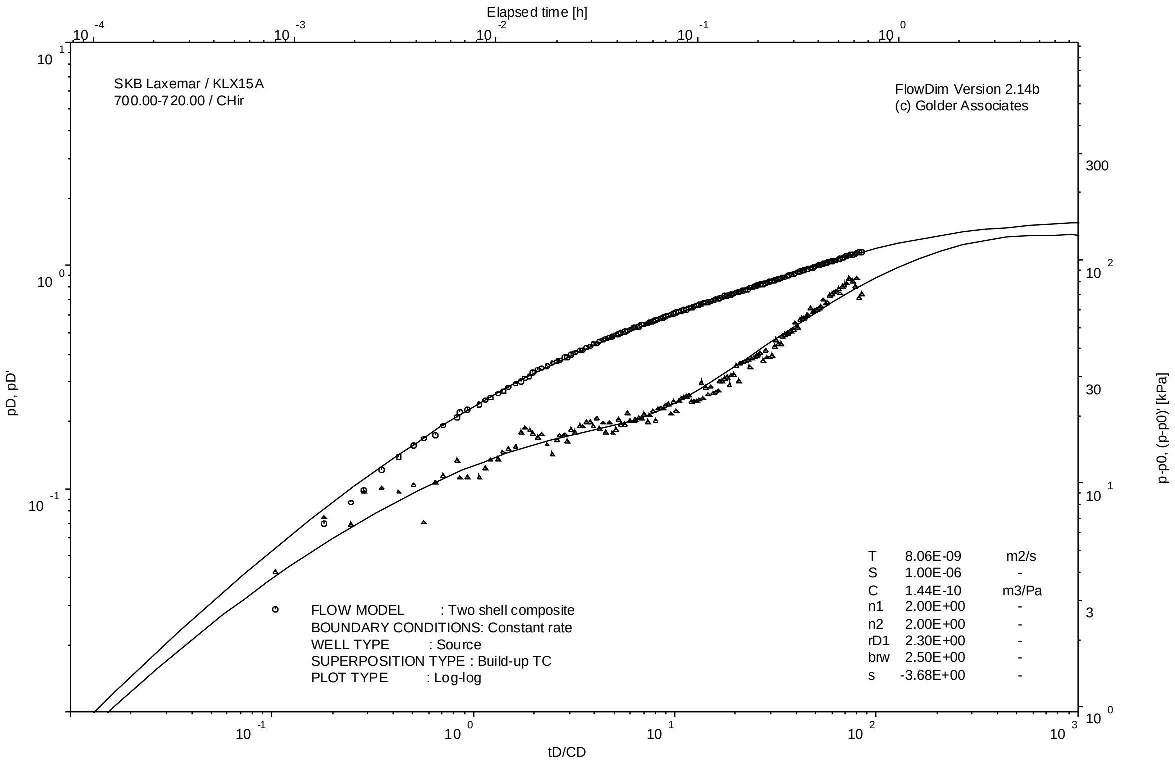
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

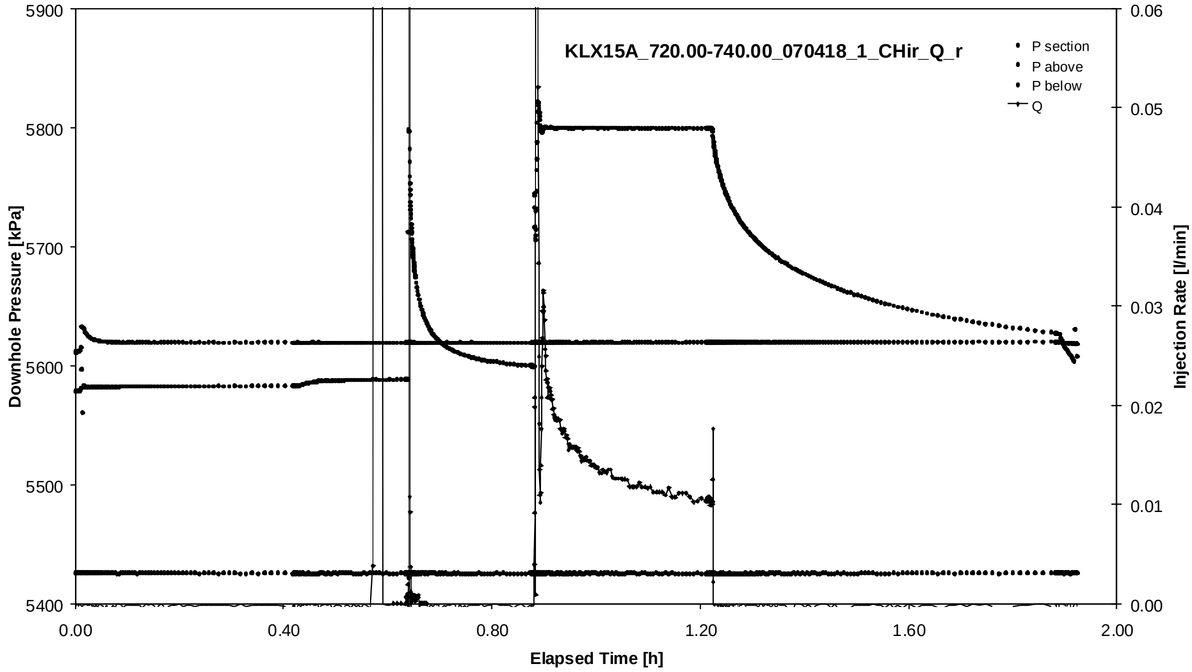
Not analysed

CHIR phase; HORNER match

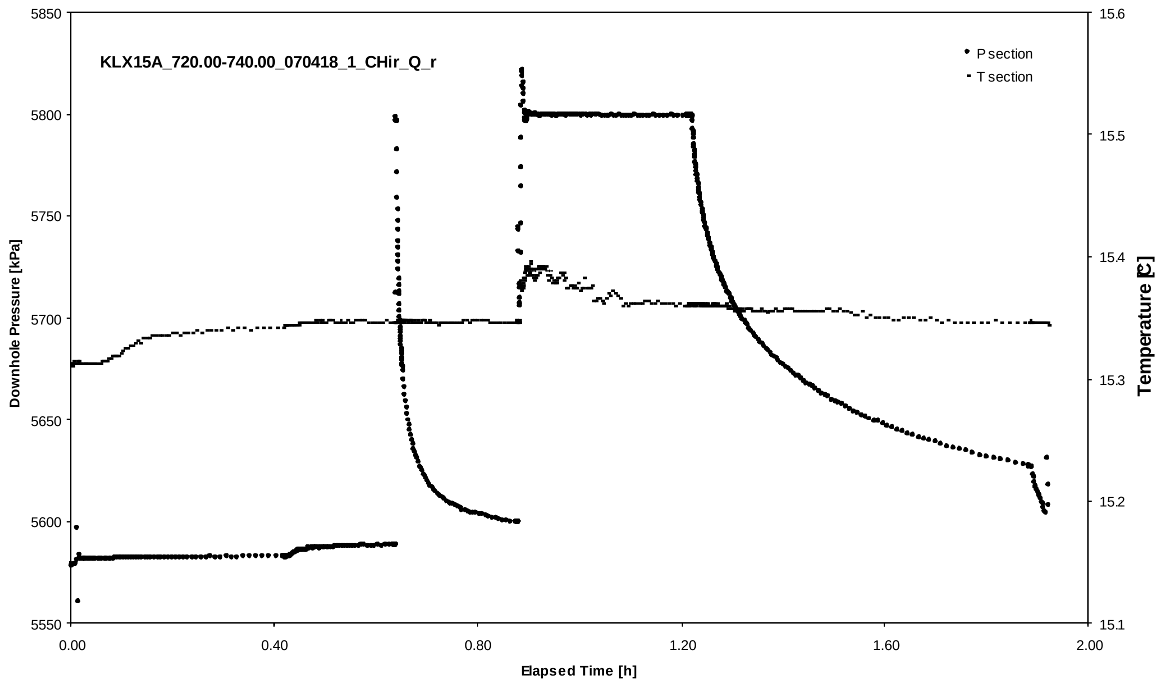
APPENDIX 2-41

Test 720.00 – 740.00 m

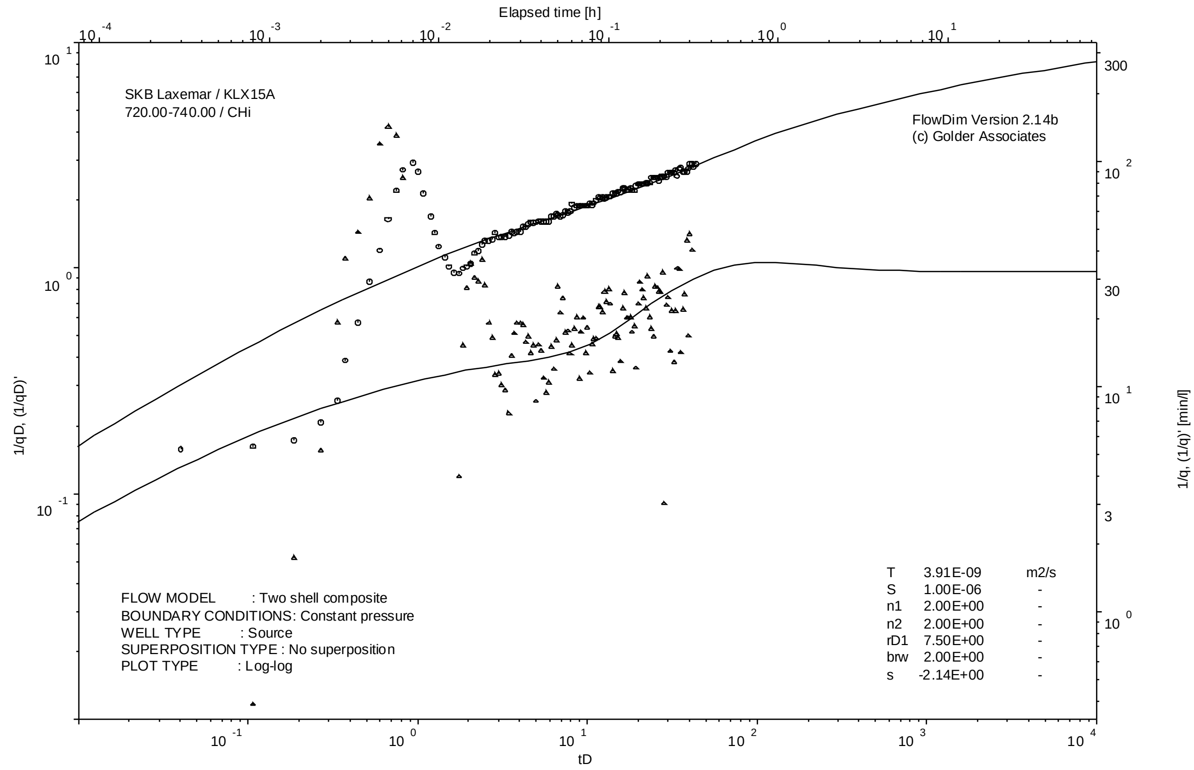
Analysis diagrams



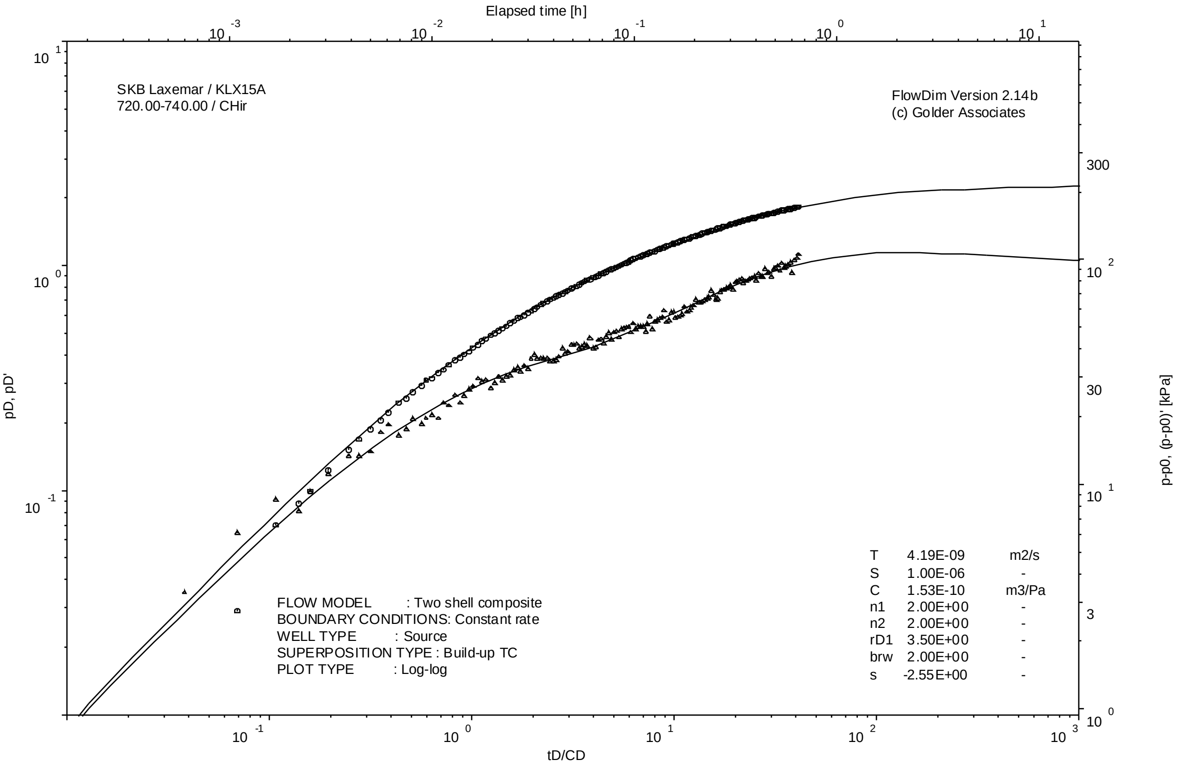
Pressure and flow rate vs. time; cartesian plot



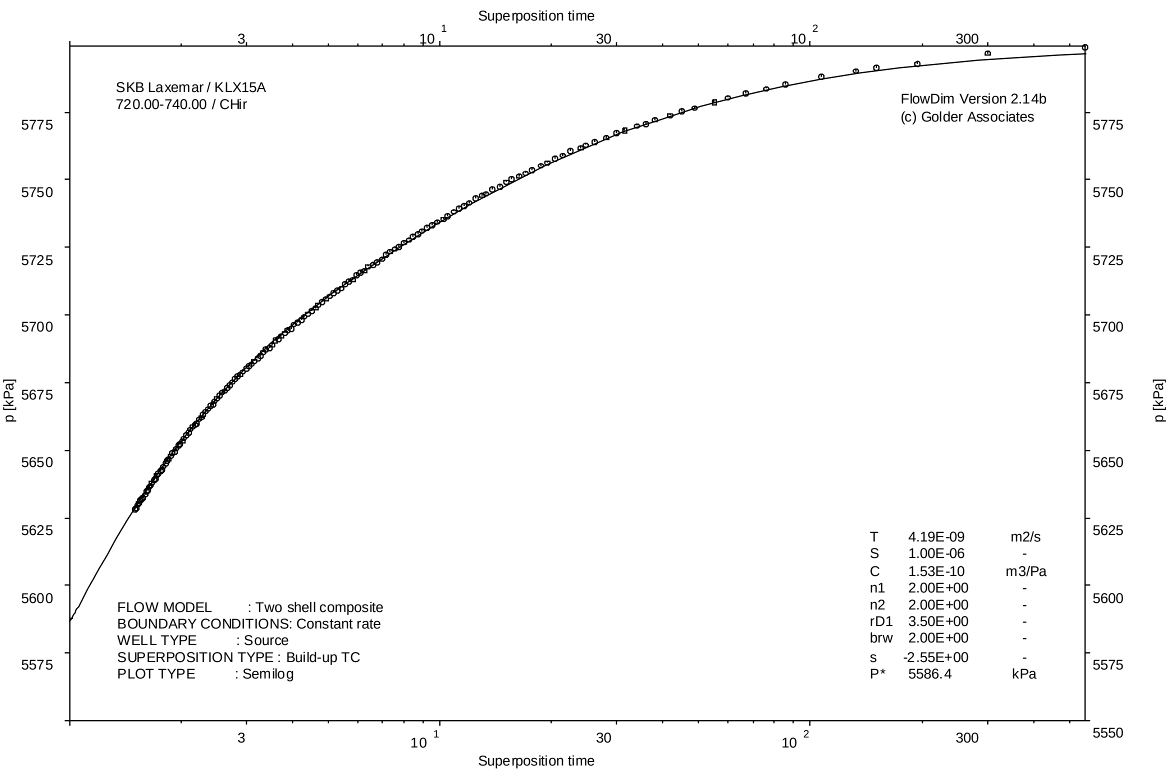
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

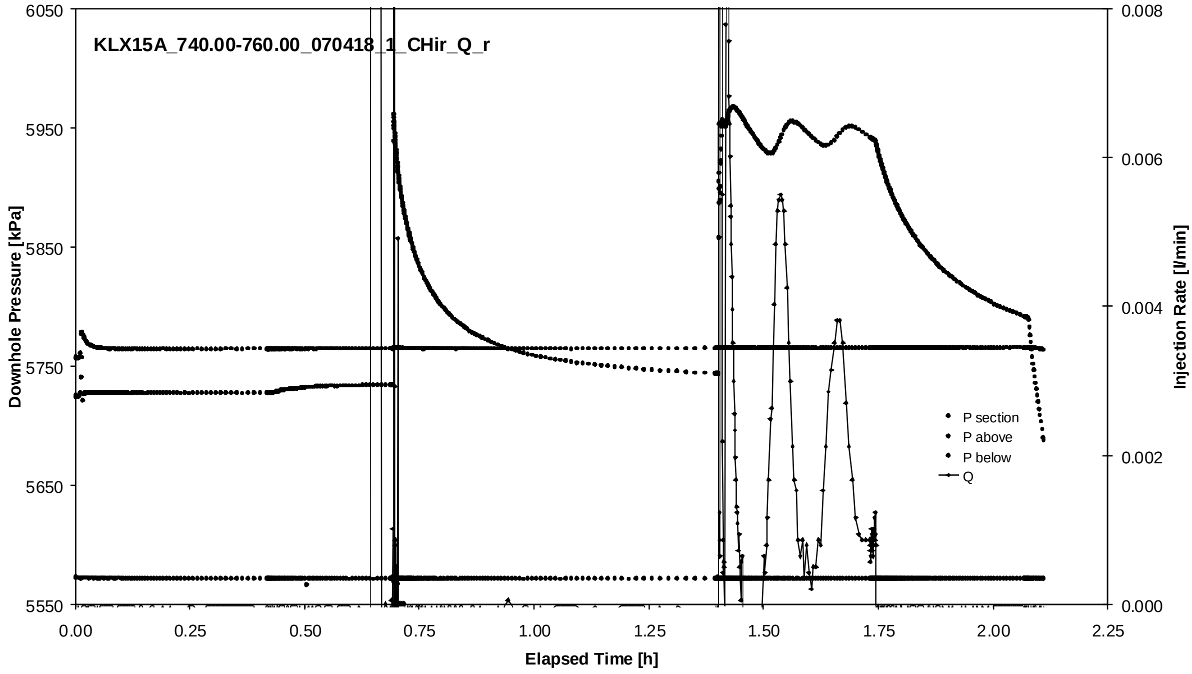


CHIR phase; HORNER match

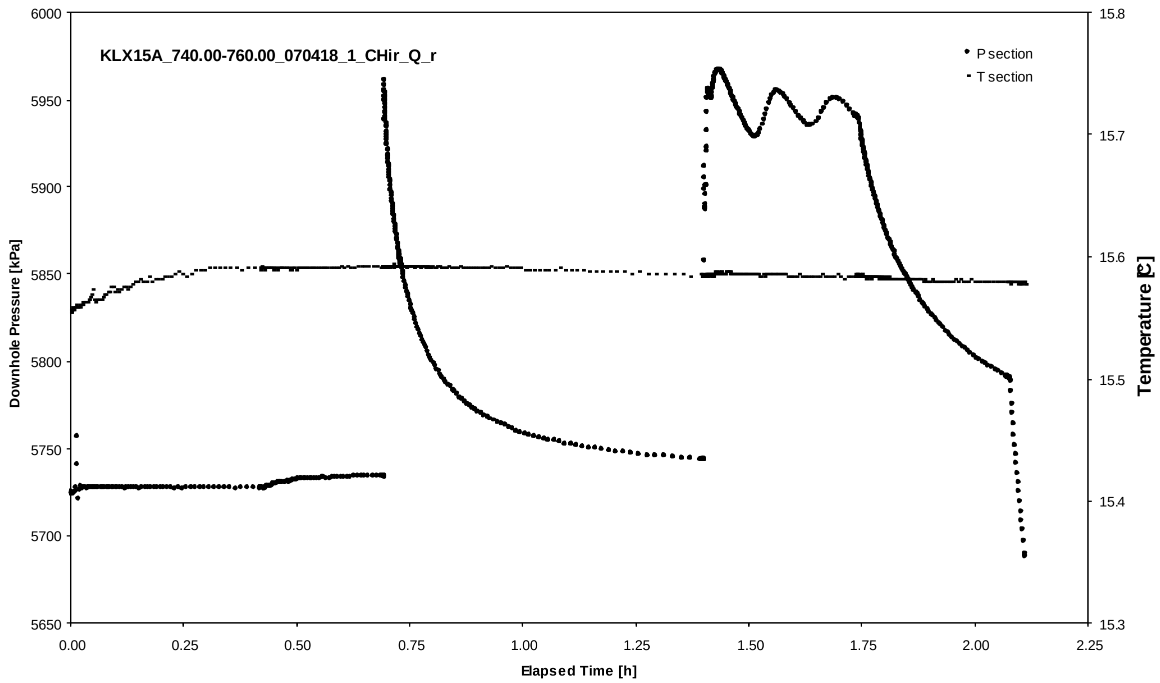
APPENDIX 2-42

Test 740.00 – 760.00 m

Analysis diagrams



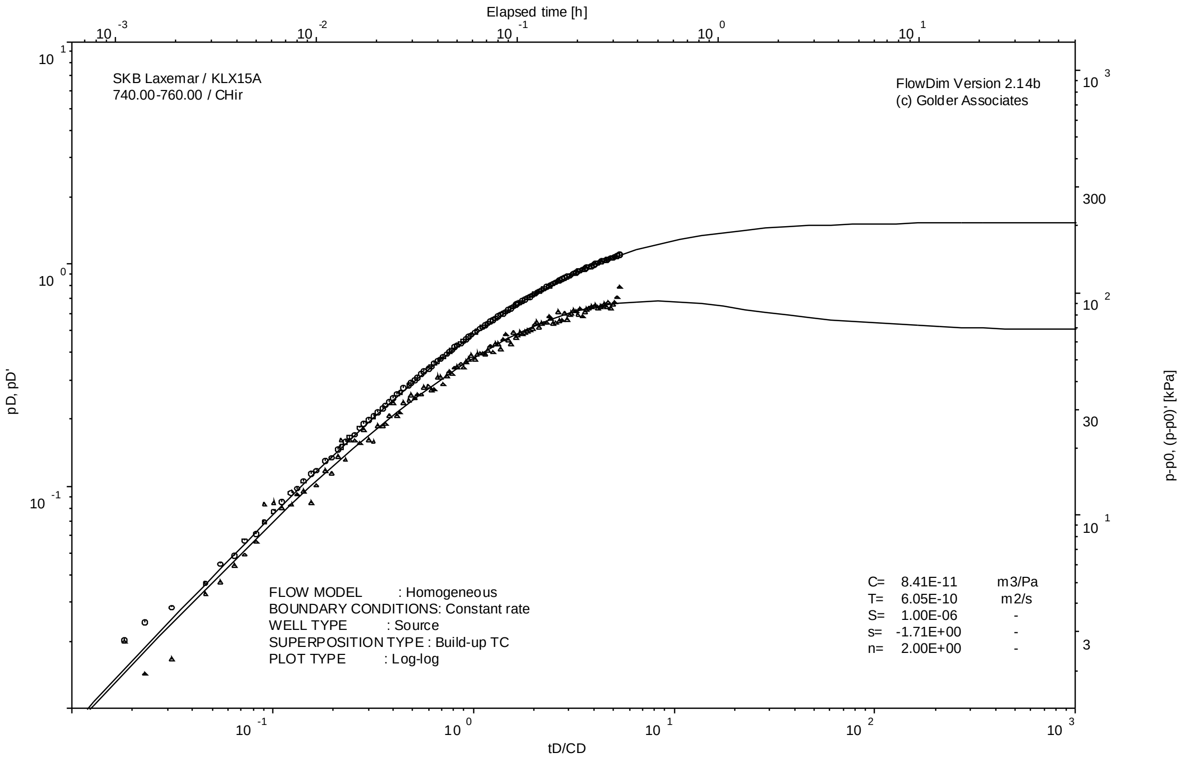
Pressure and flow rate vs. time; cartesian plot



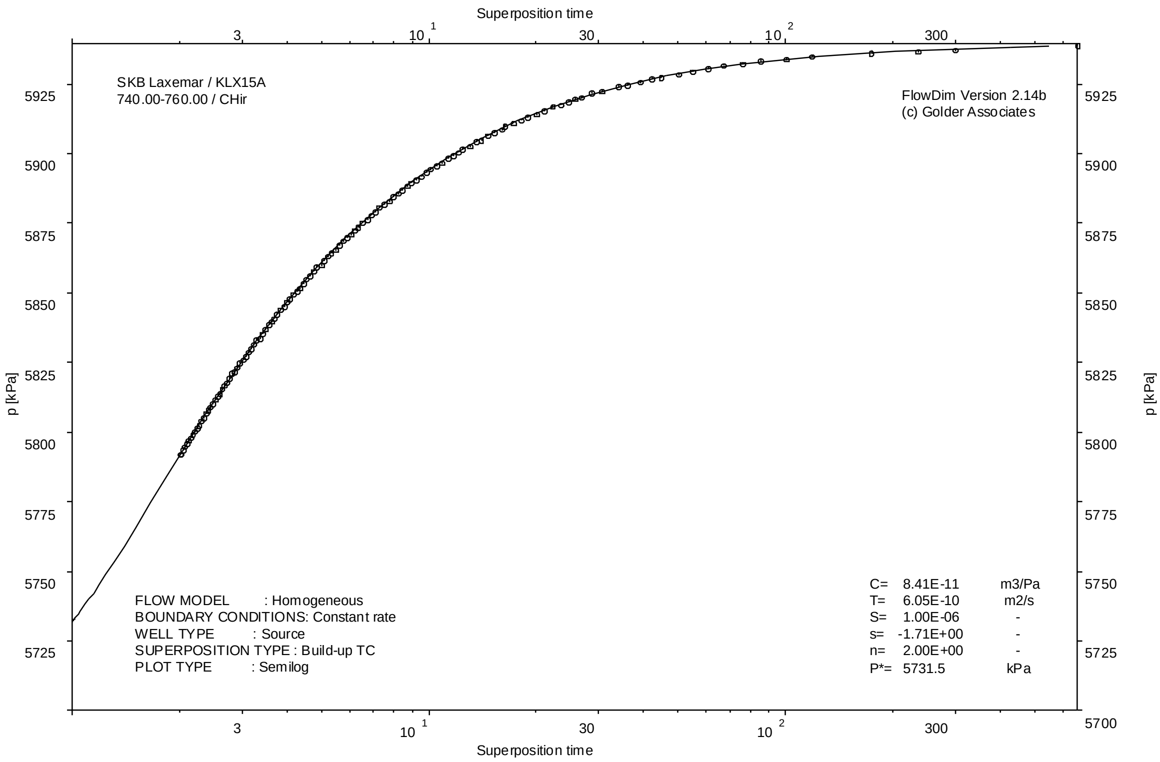
Interval pressure and temperature vs. time; cartesian plot

Not analysed

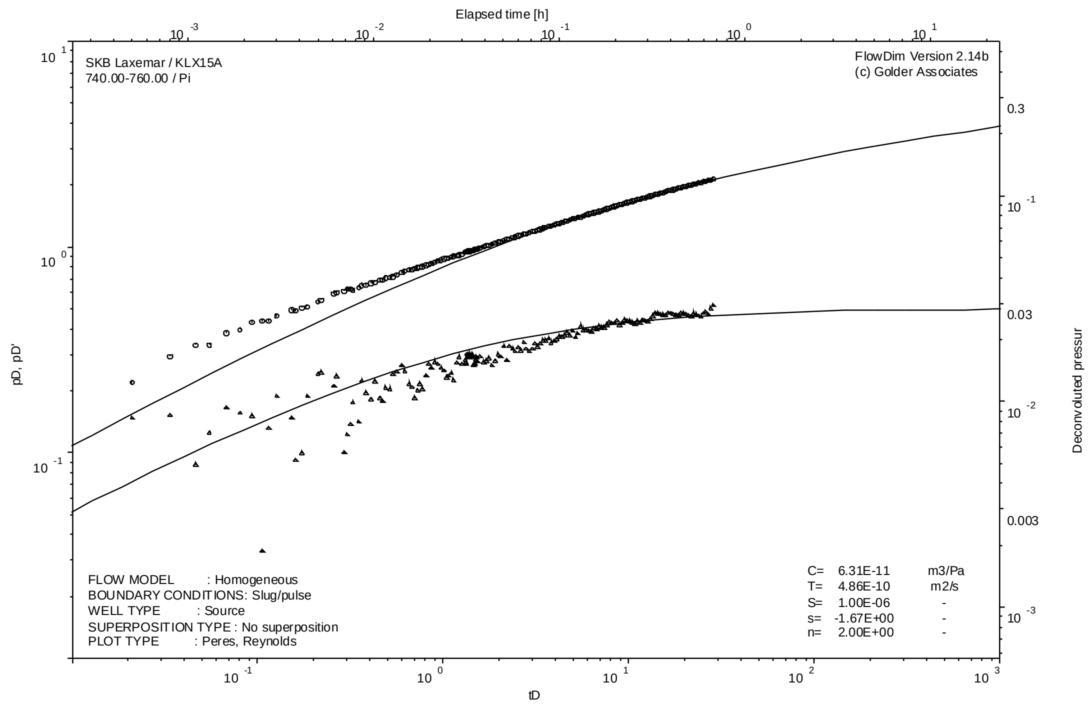
CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

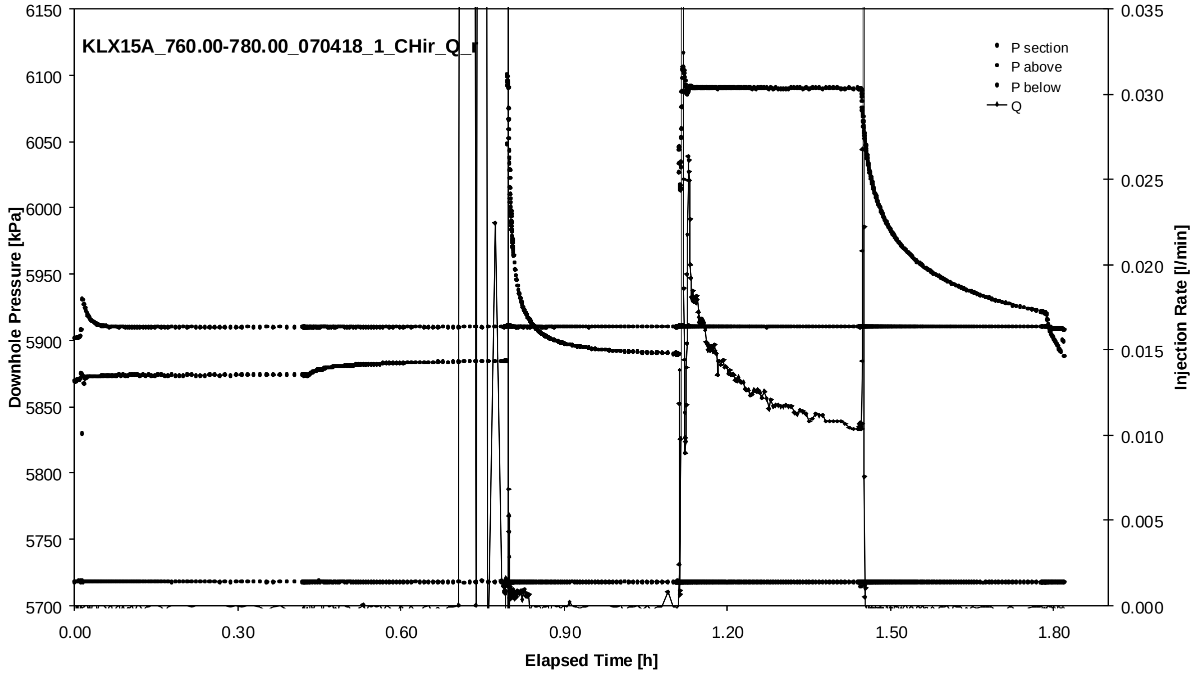


Pi phase; log-log match

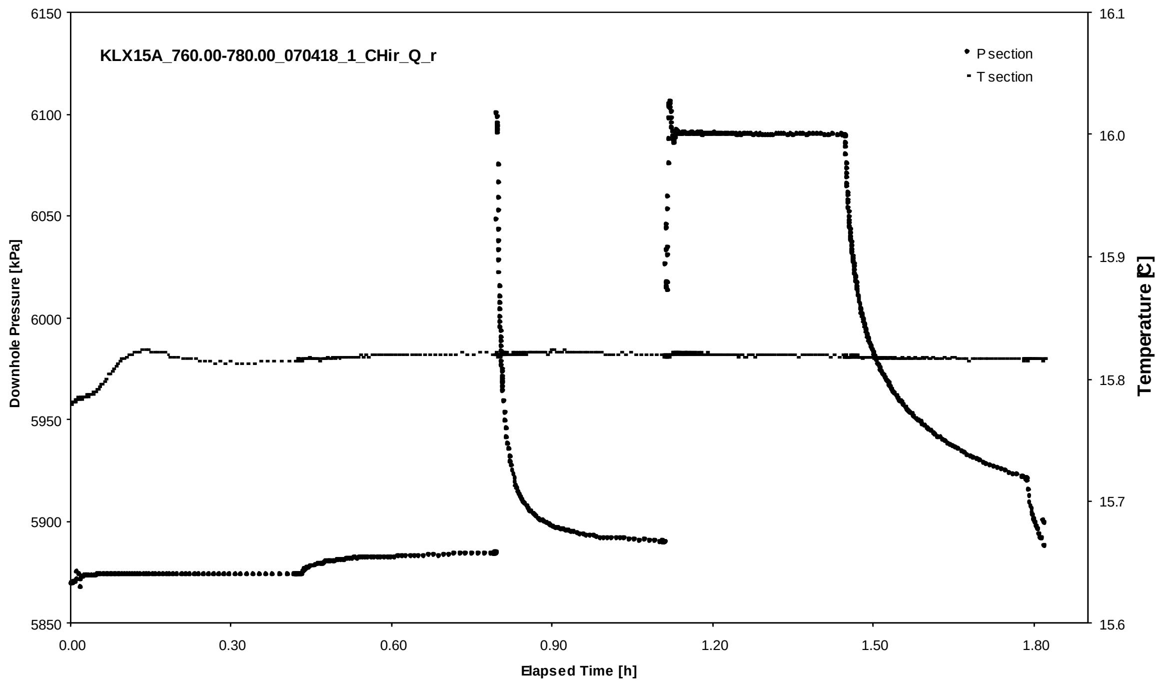
APPENDIX 2-43

Test 760.00 – 780.00 m

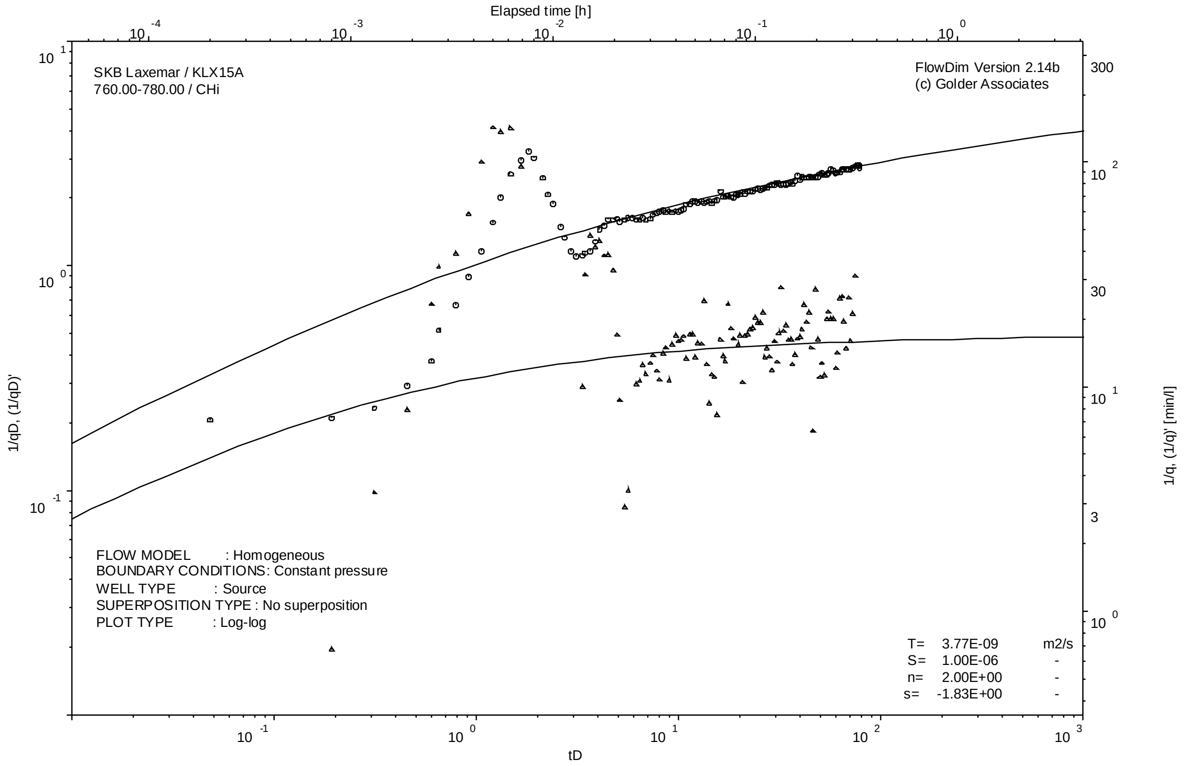
Analysis diagrams



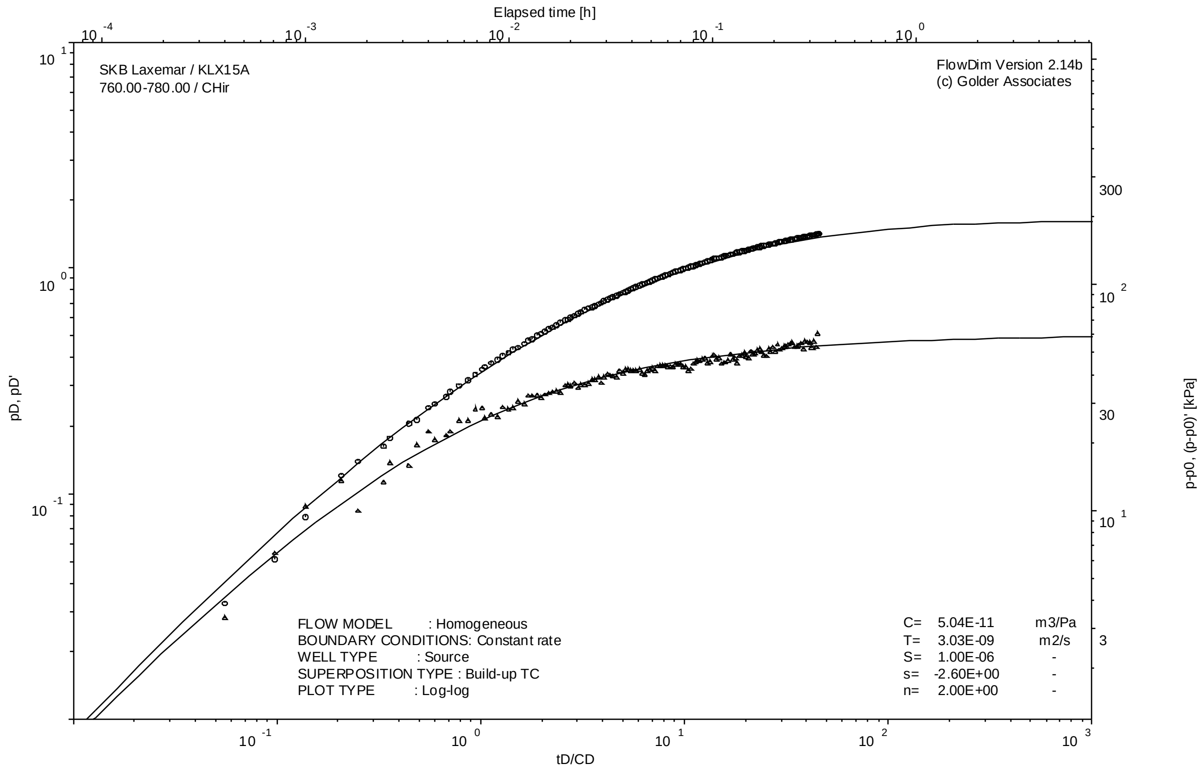
Pressure and flow rate vs. time; cartesian plot



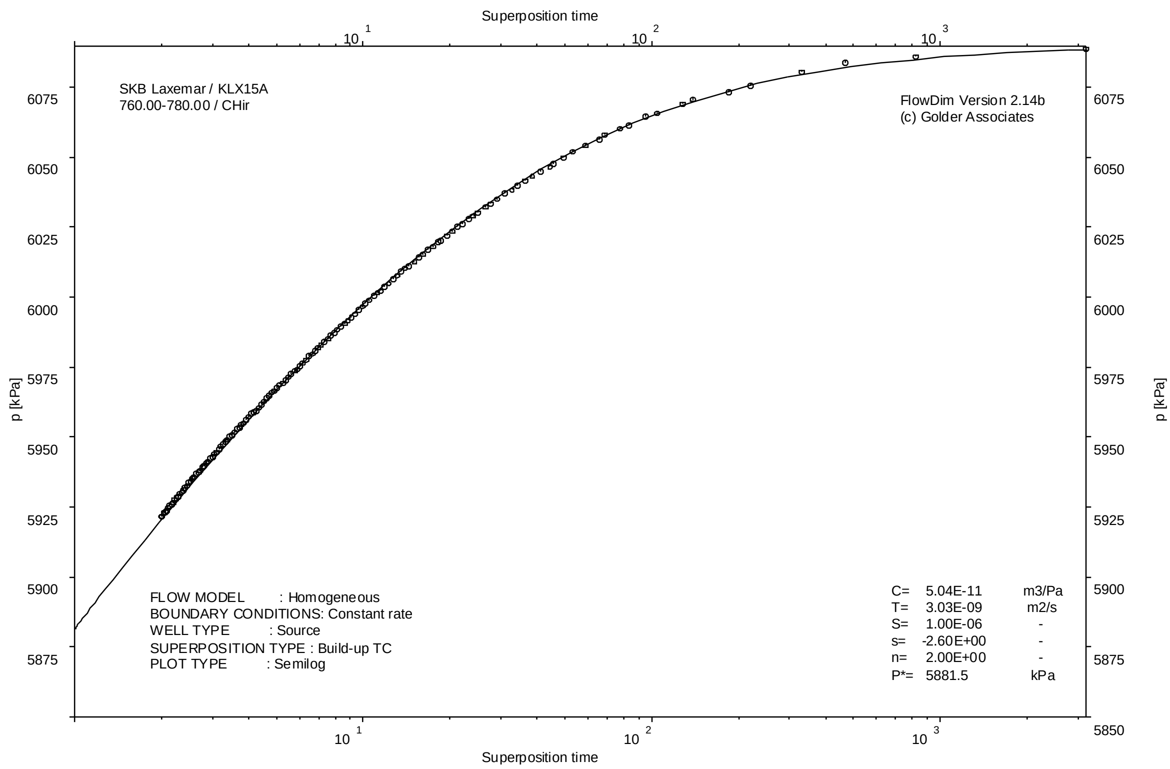
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

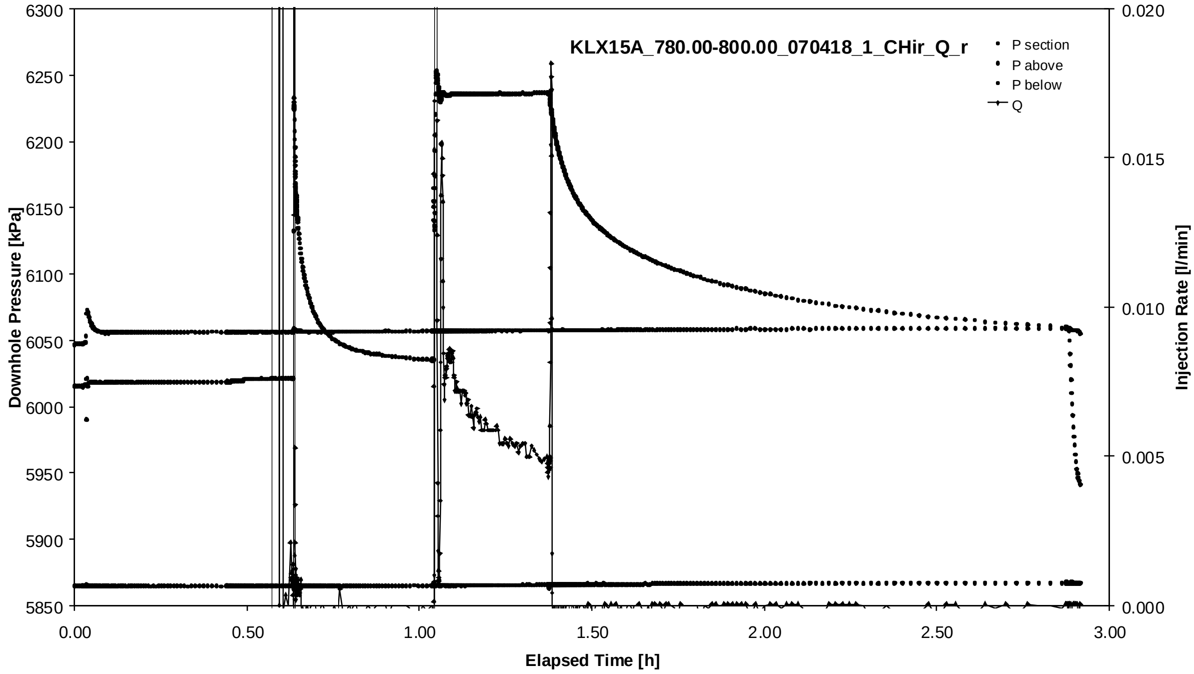


CHIR phase; HORNER match

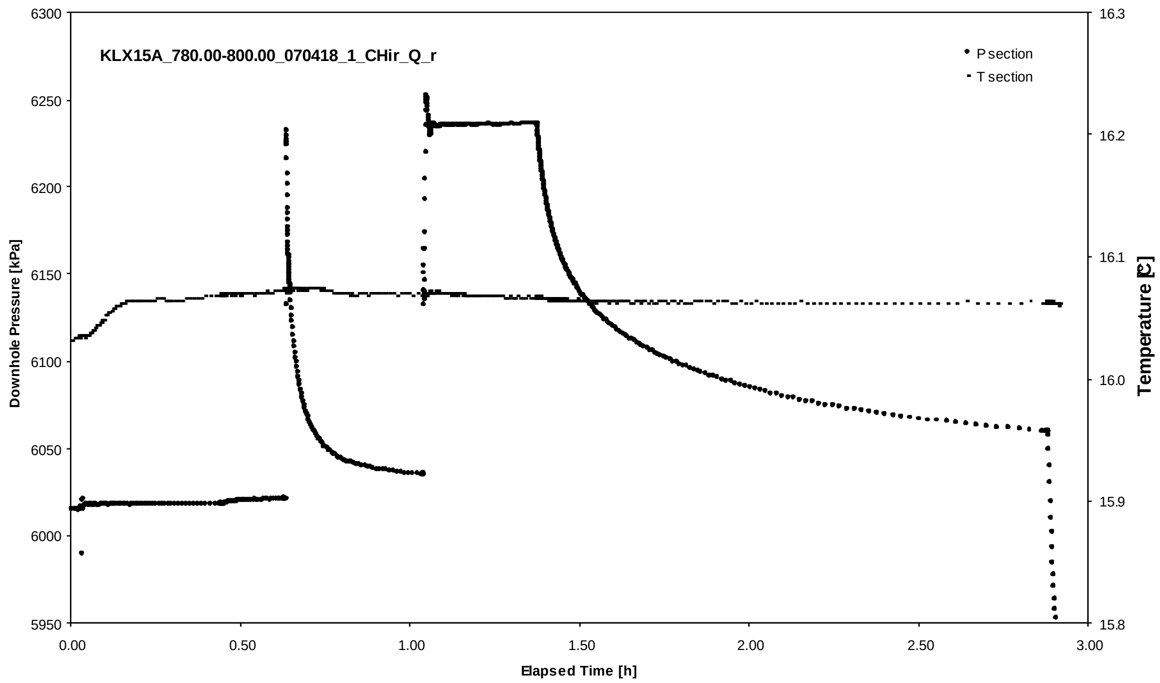
APPENDIX 2-44

Test 780.00 – 800.00 m

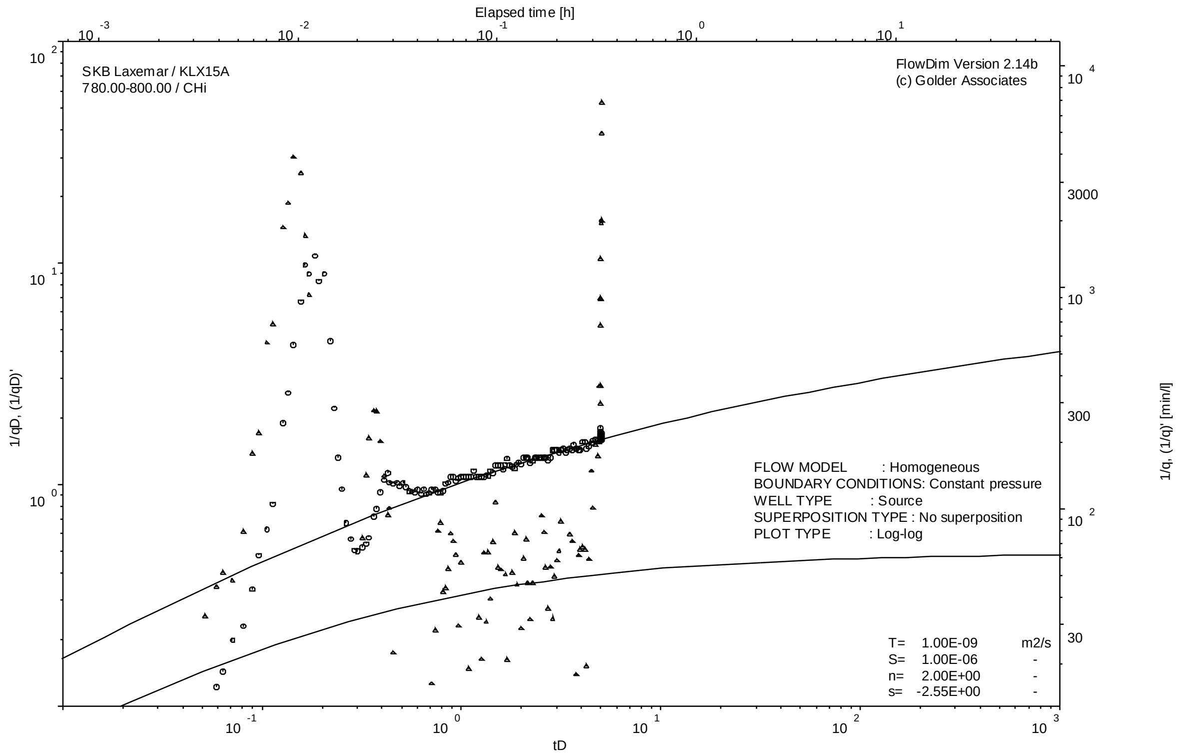
Analysis diagrams



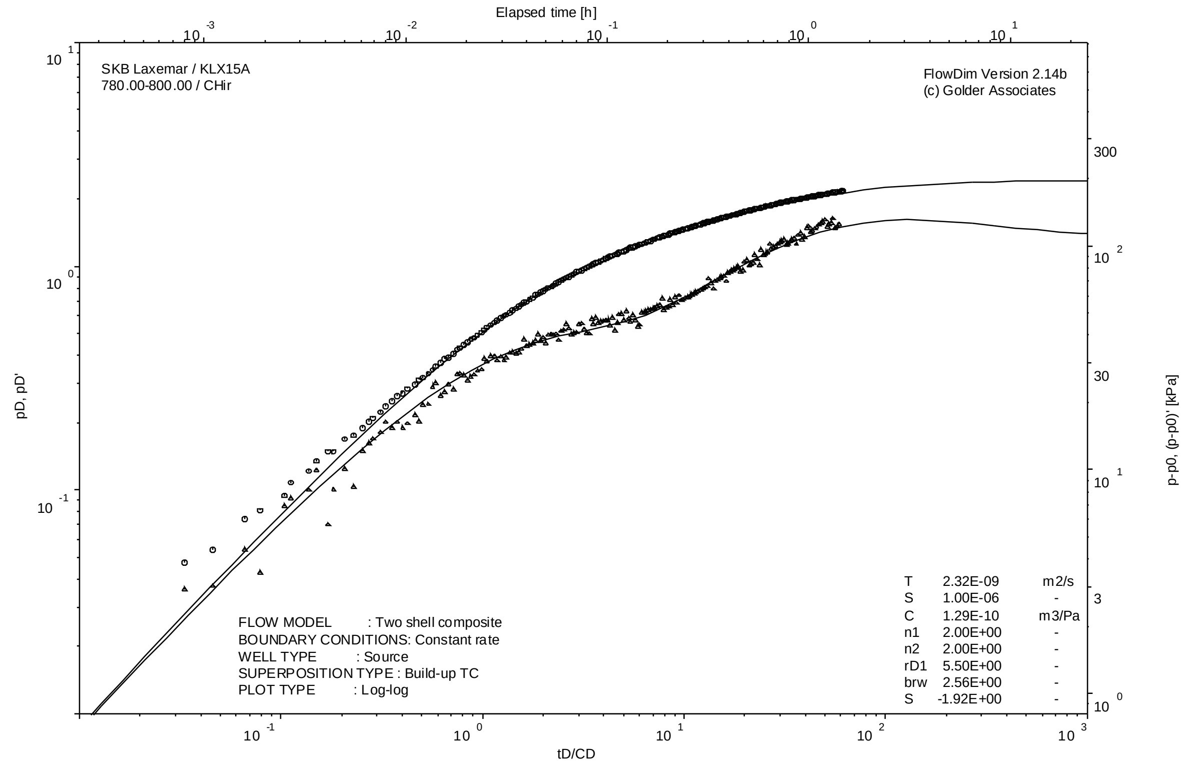
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

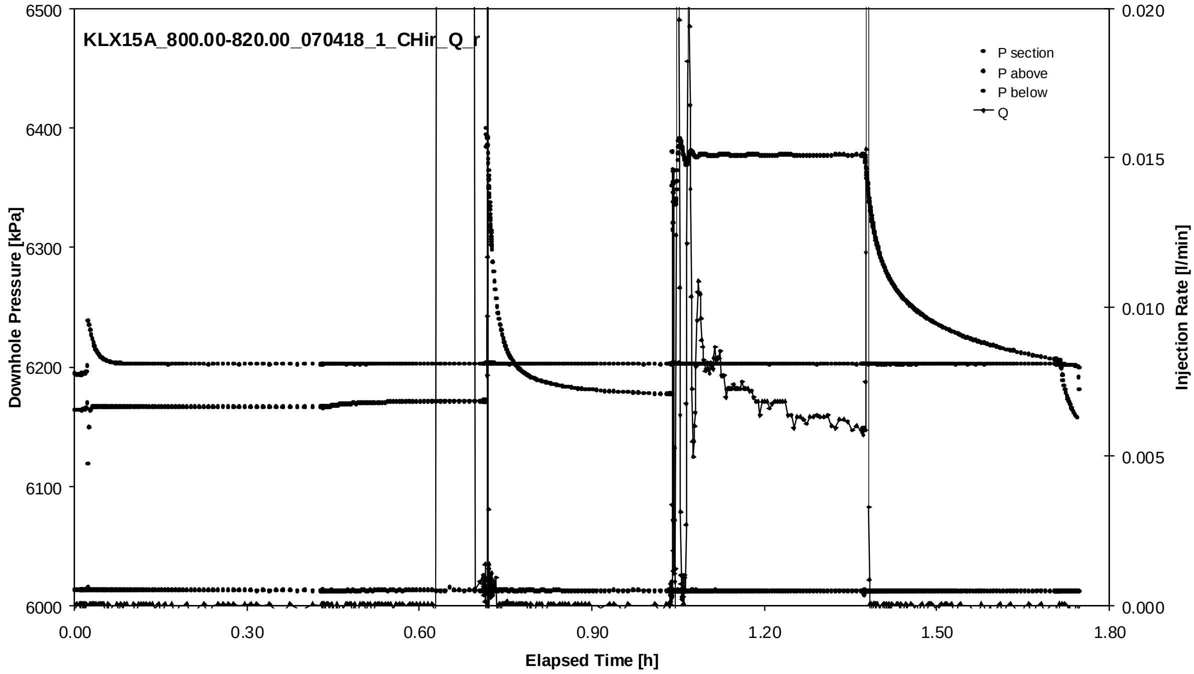
Not analysable

CHIR phase; HORNER match

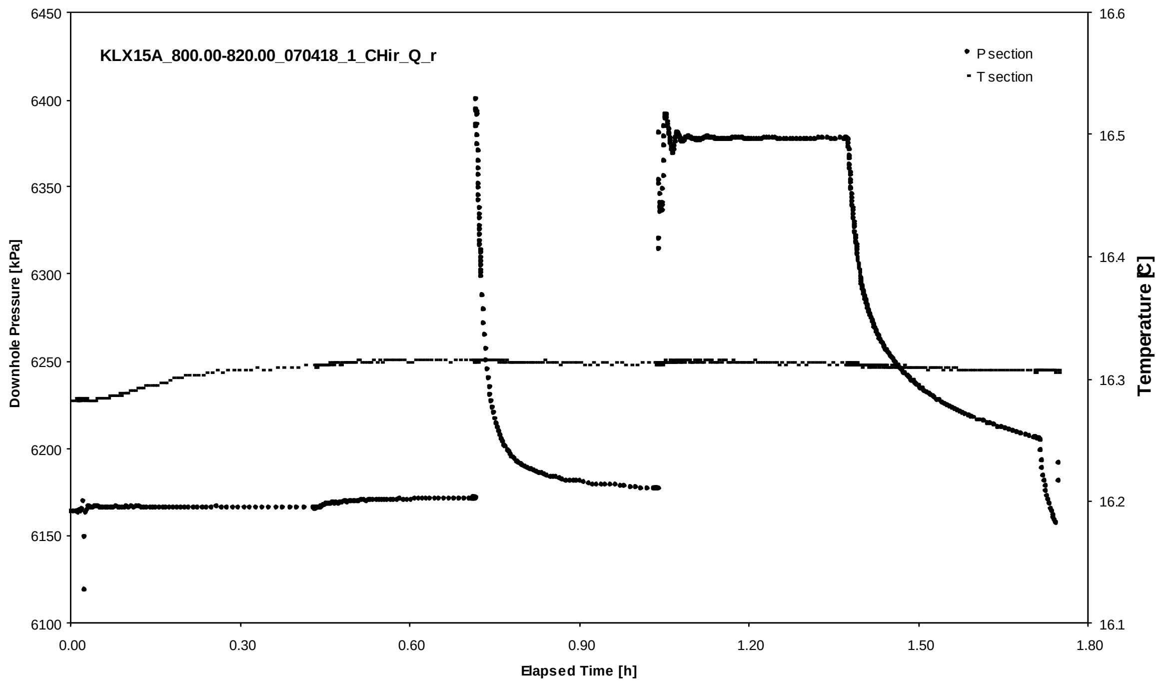
APPENDIX 2-45

Test 800.00 – 820.00 m

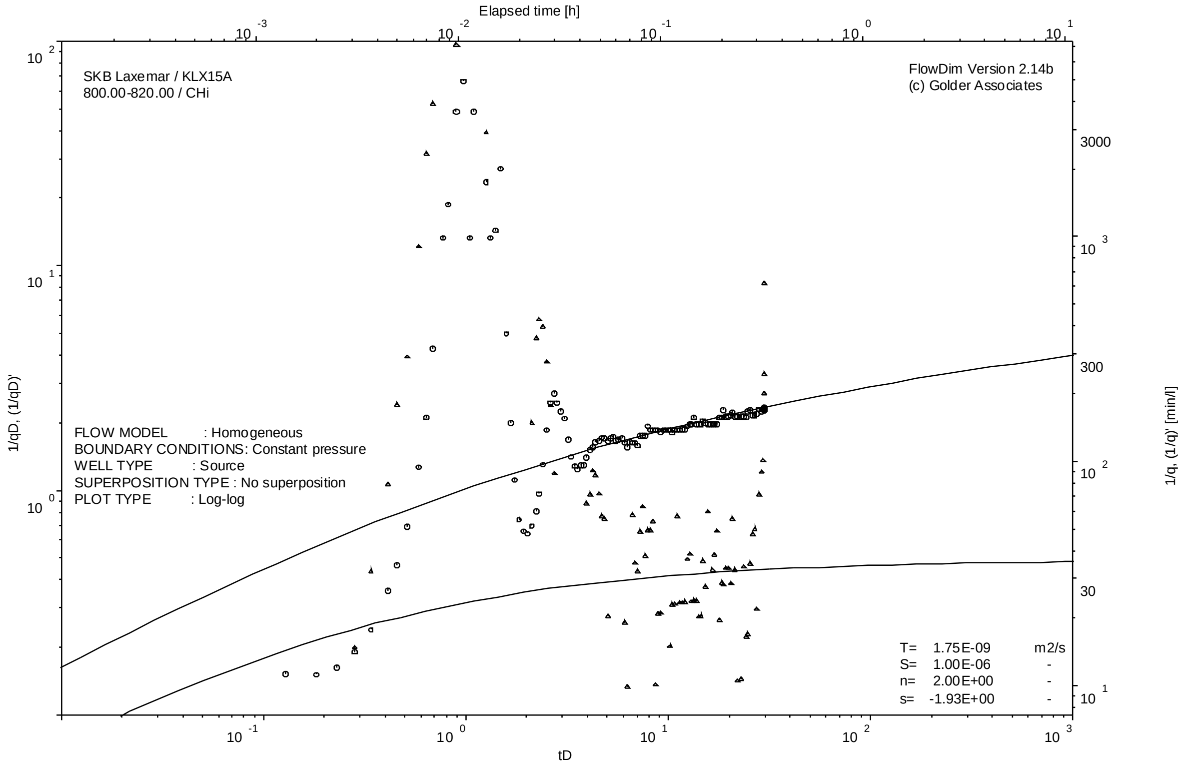
Analysis diagrams



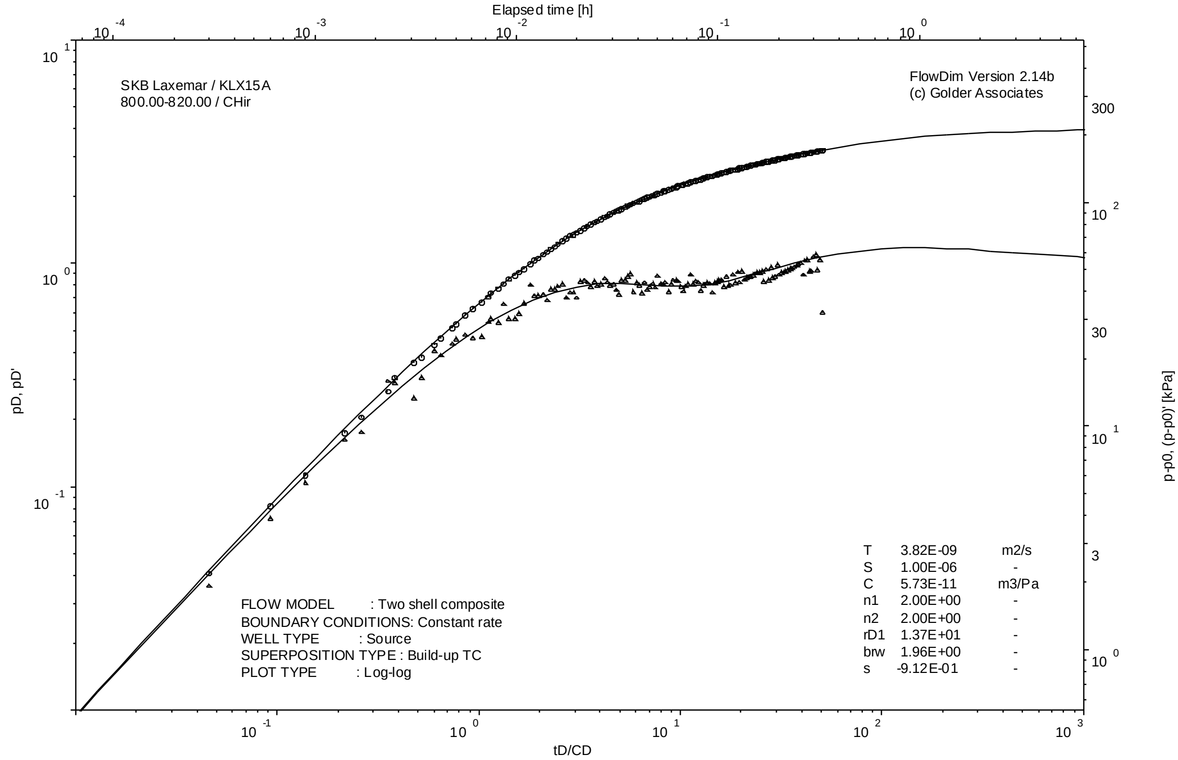
Pressure and flow rate vs. time; cartesian plot



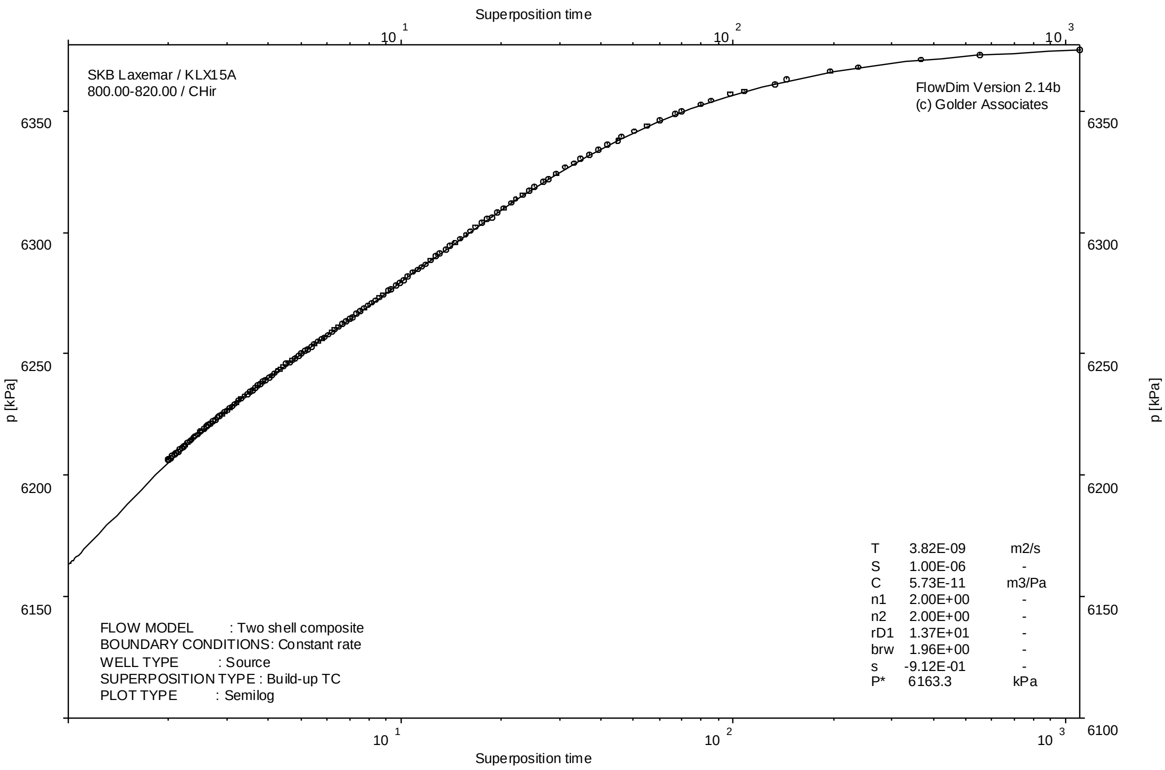
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

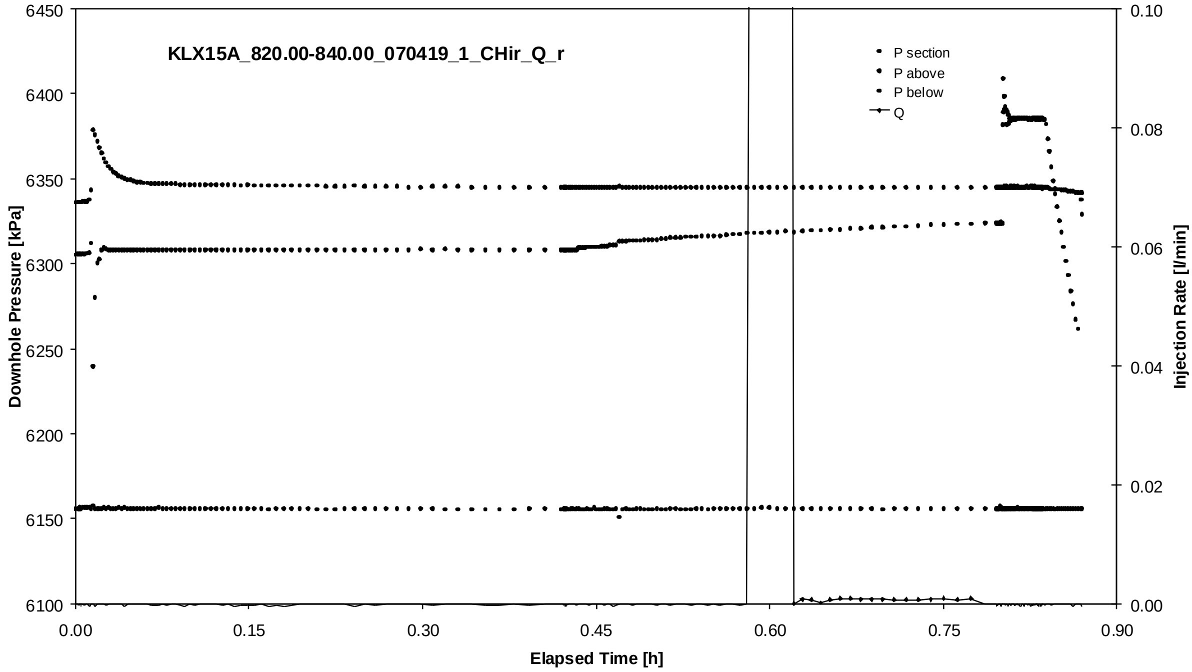


CHIR phase; HORNER match

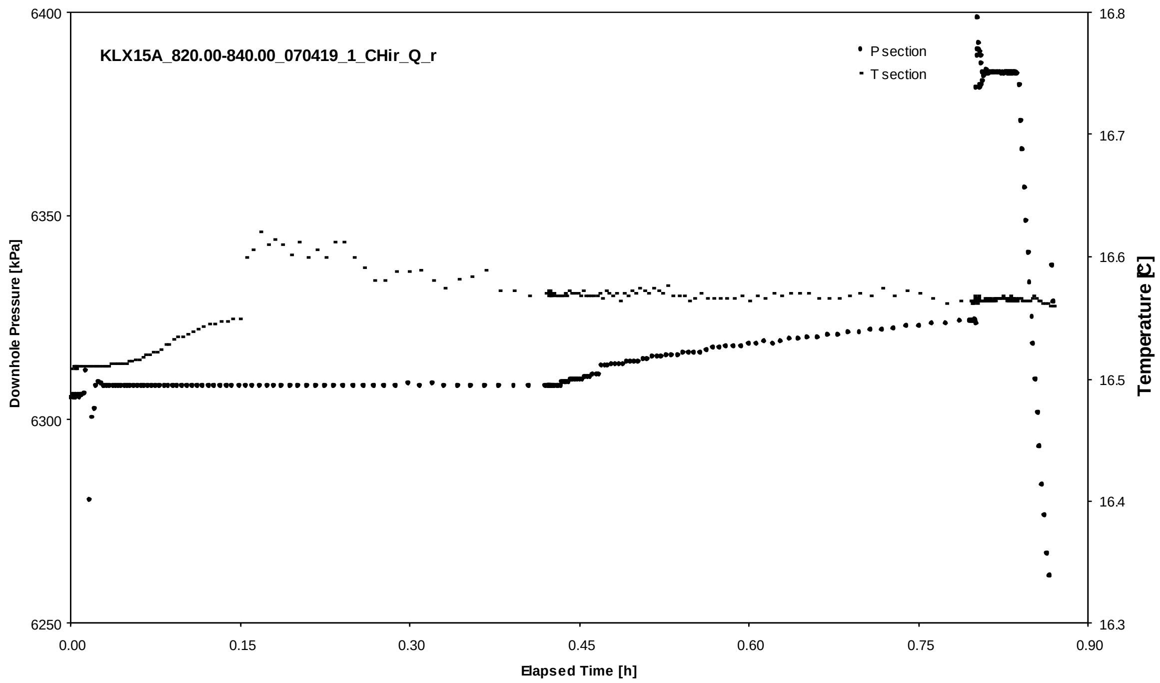
APPENDIX 2-46

Test 820.00 – 840.00 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

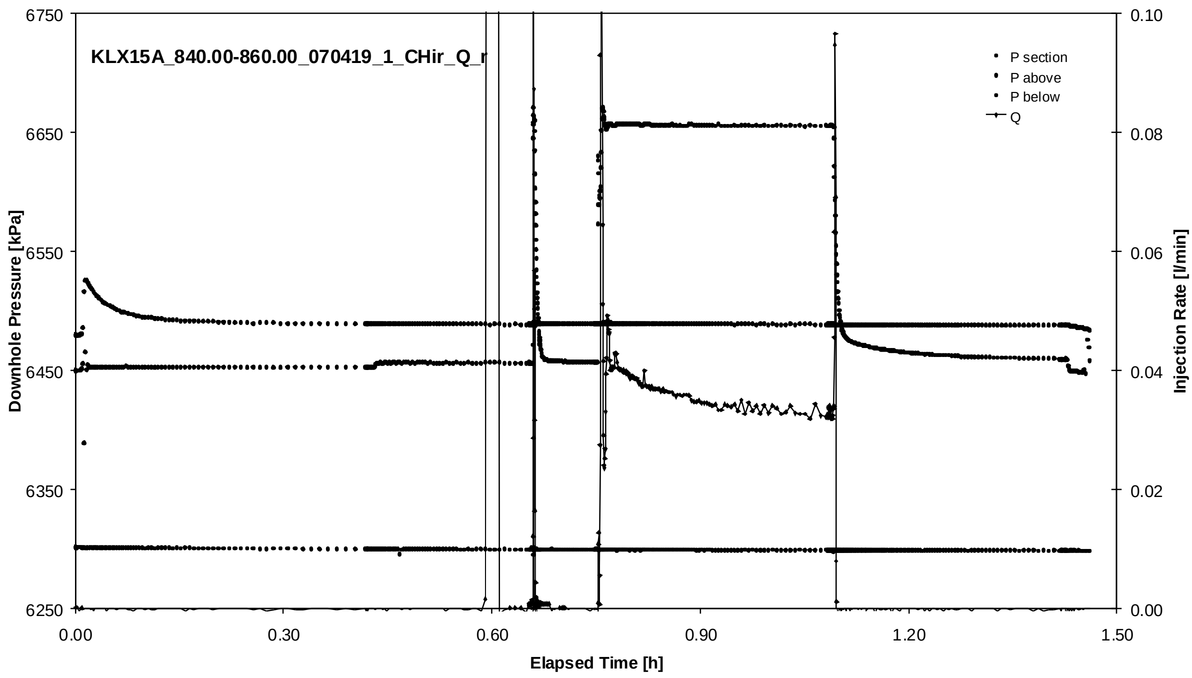
Not analysed

CHIR phase; HORNER match

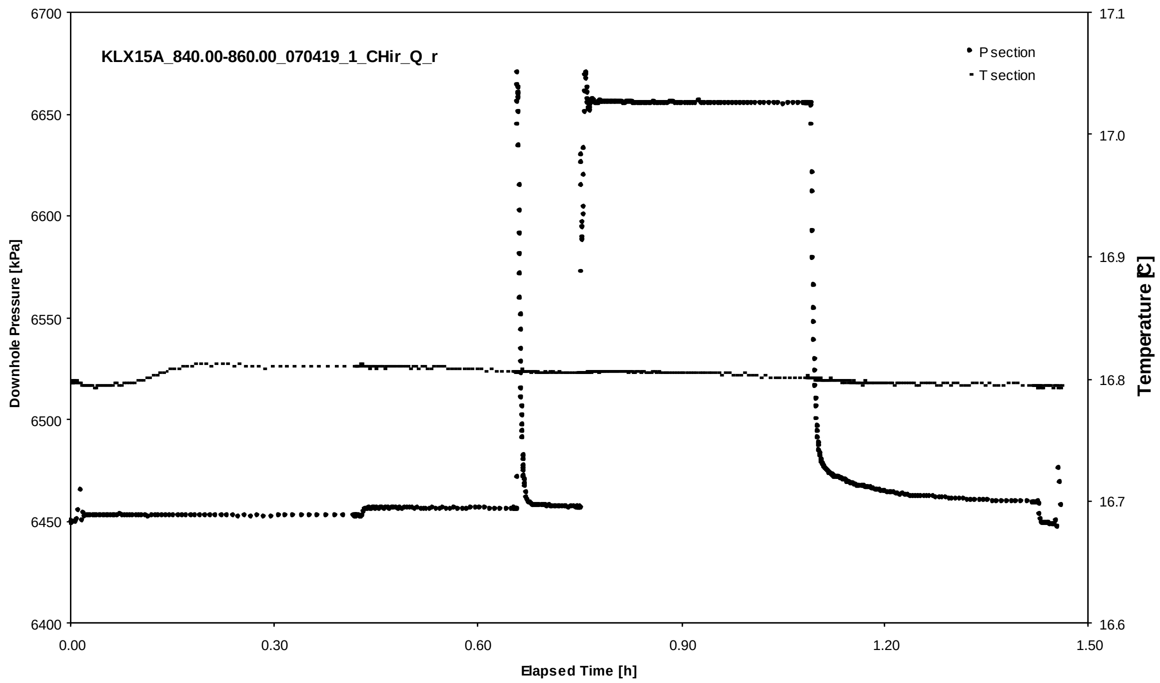
APPENDIX 2-47

Test 840.00 – 860.00 m

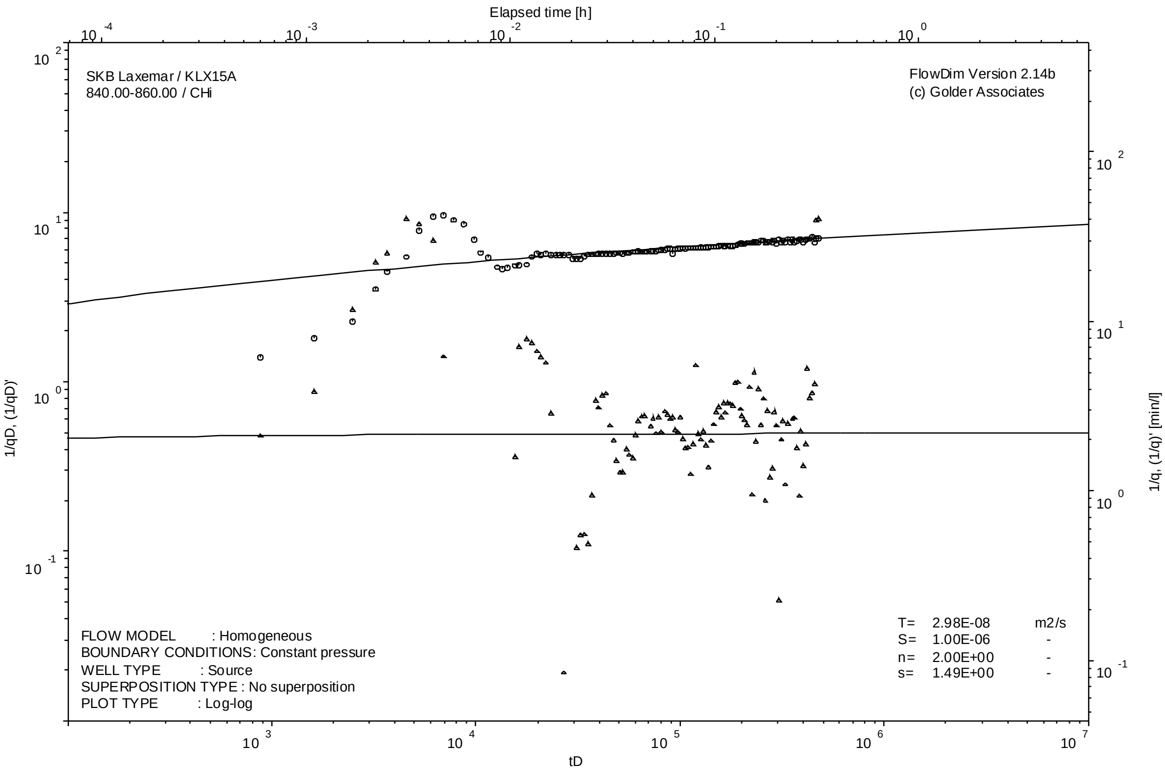
Analysis diagrams



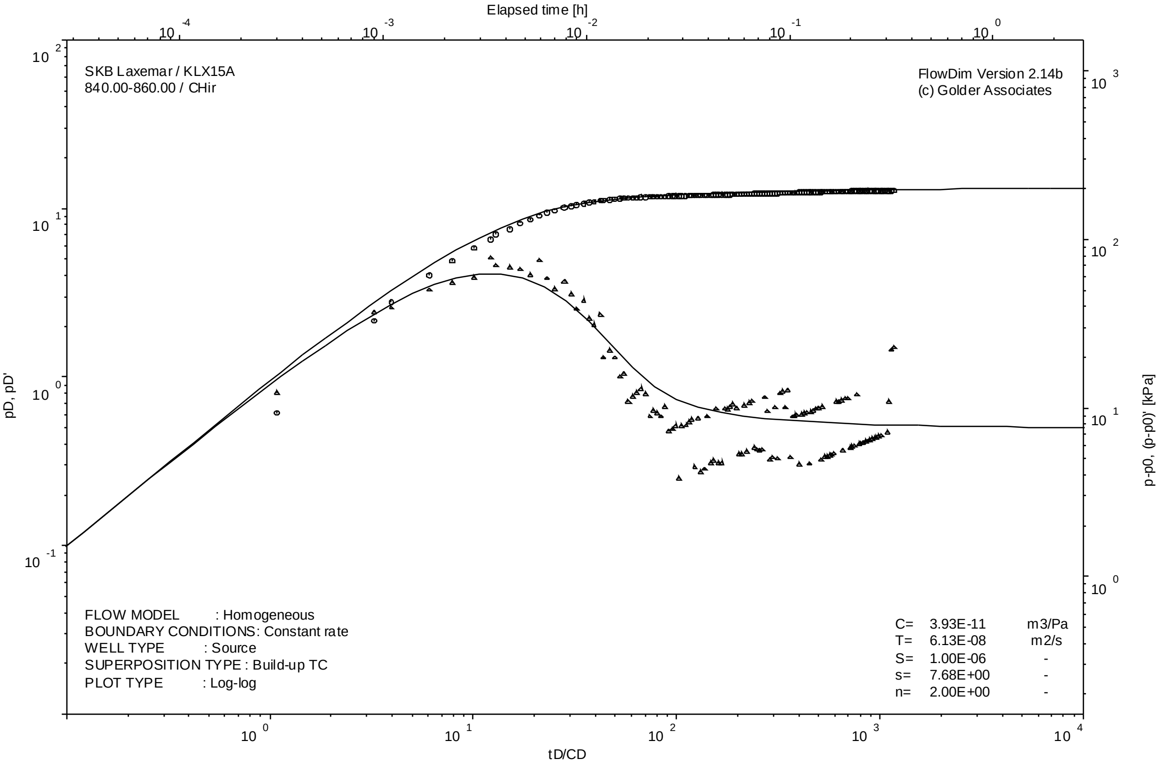
Pressure and flow rate vs. time; cartesian plot



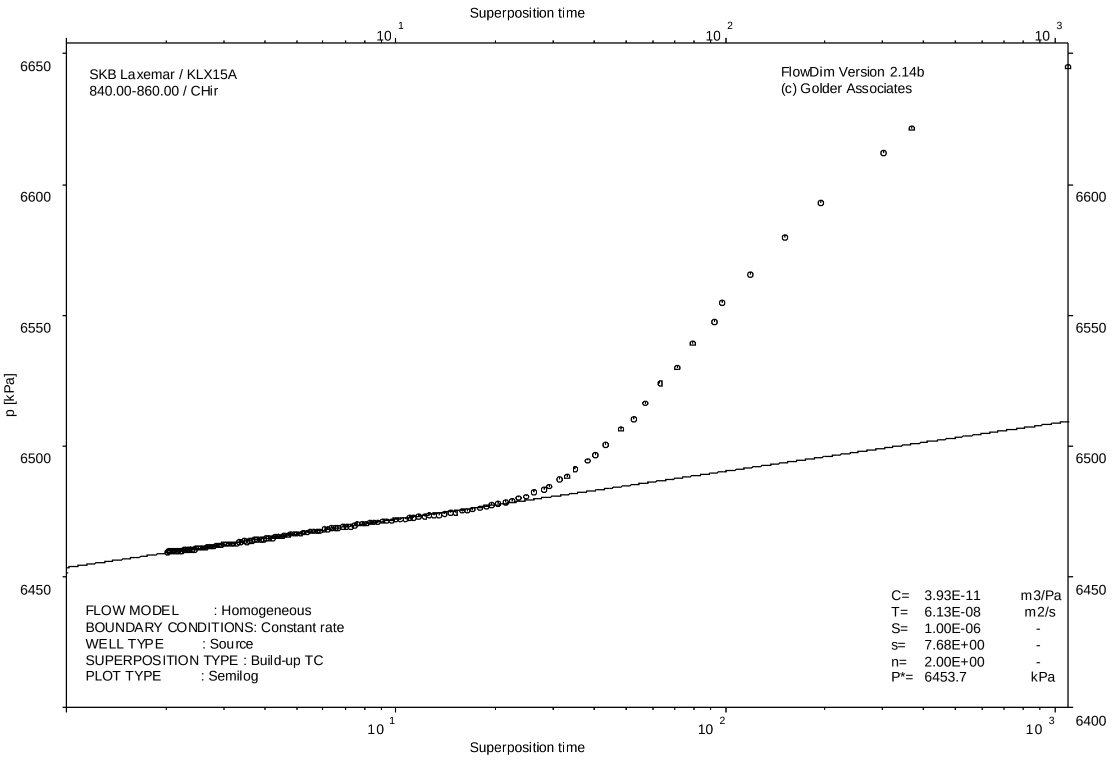
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

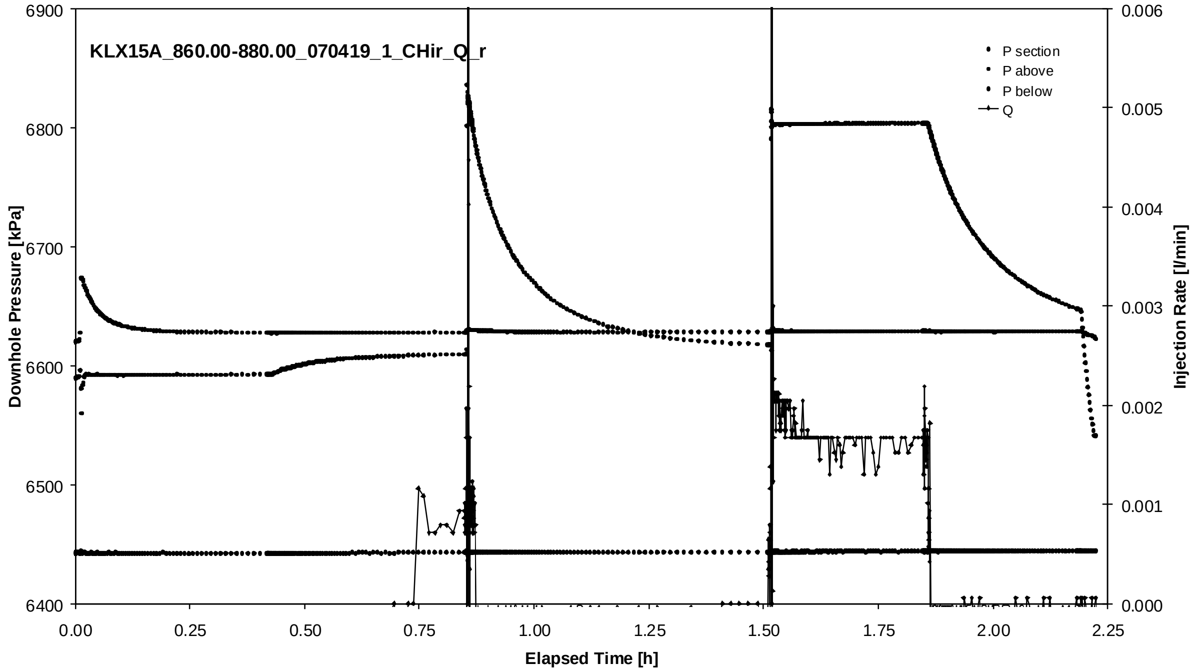


CHIR phase; HORNER match

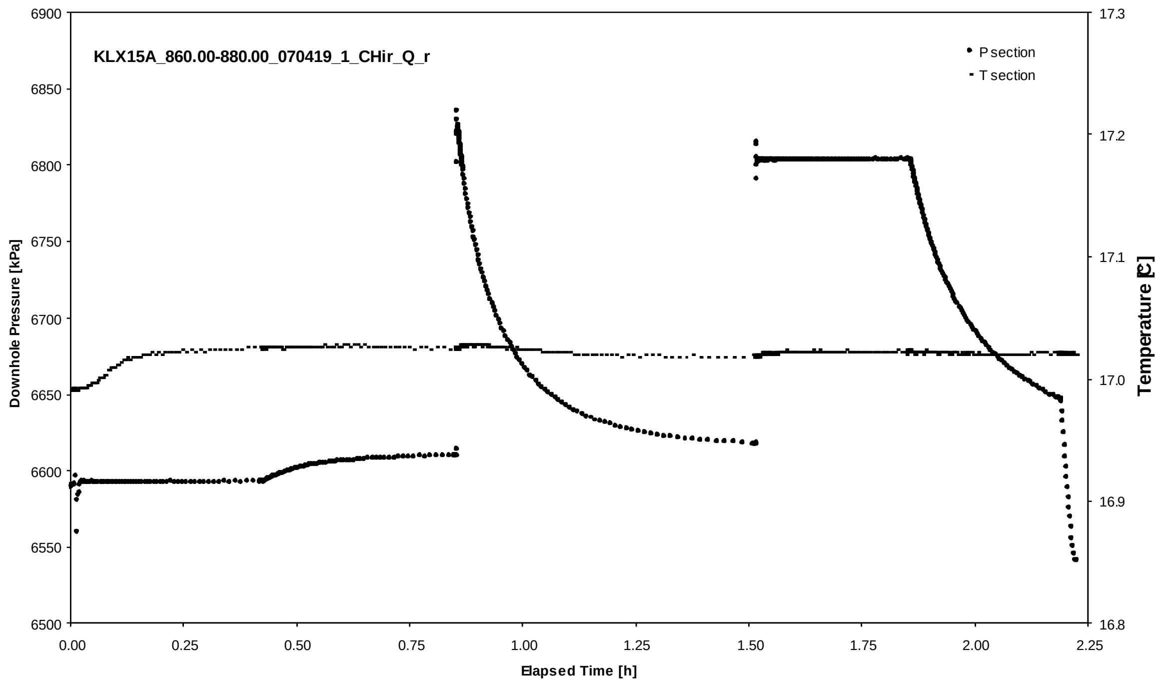
APPENDIX 2-48

Test 860.00 – 880.00 m

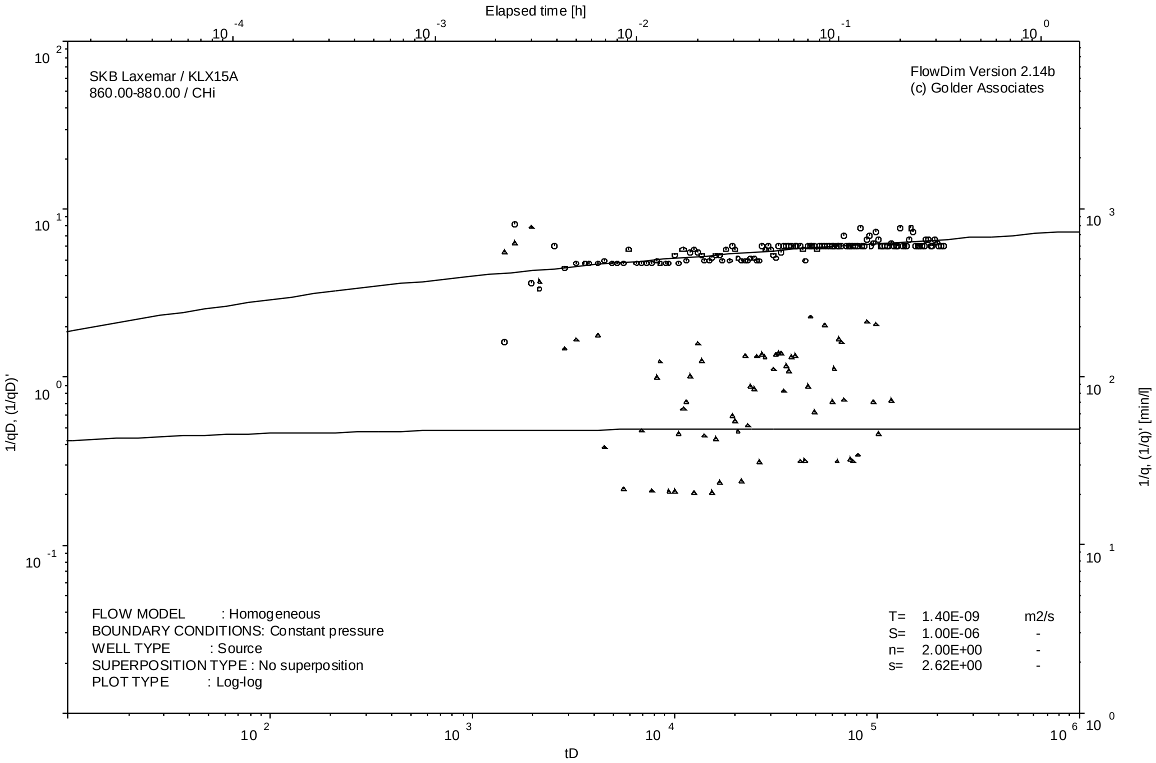
Analysis diagrams



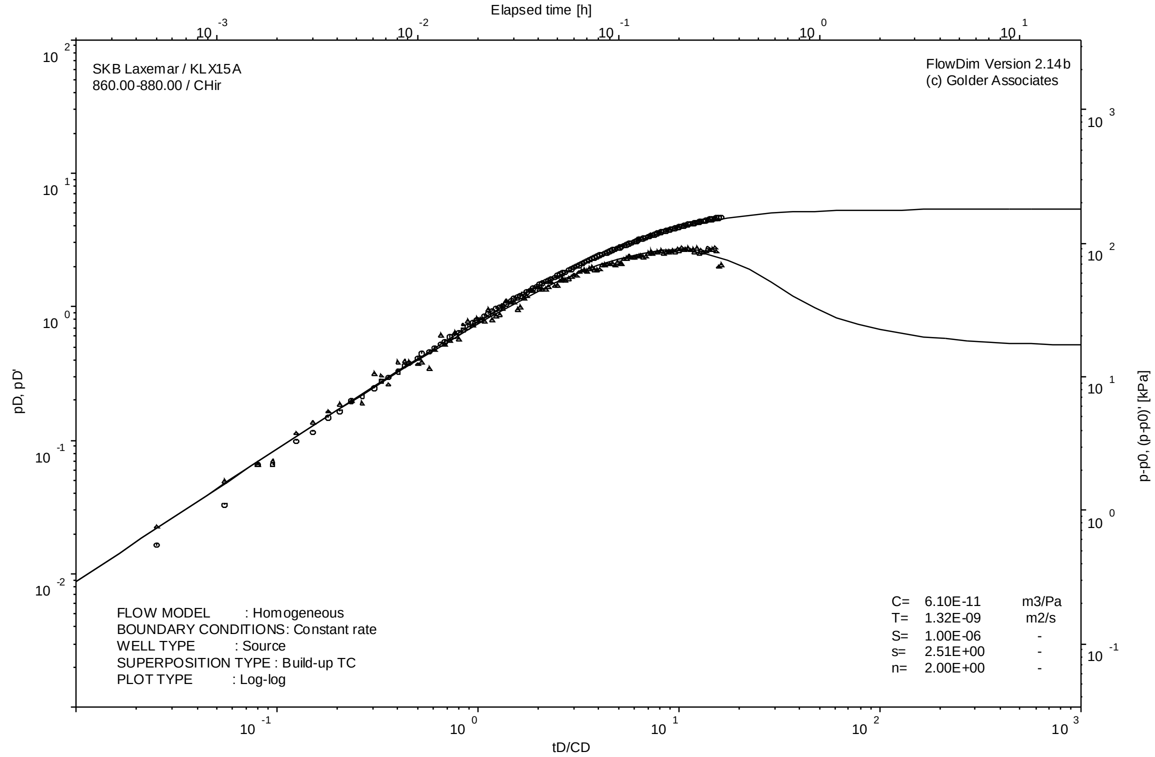
Pressure and flow rate vs. time; cartesian plot



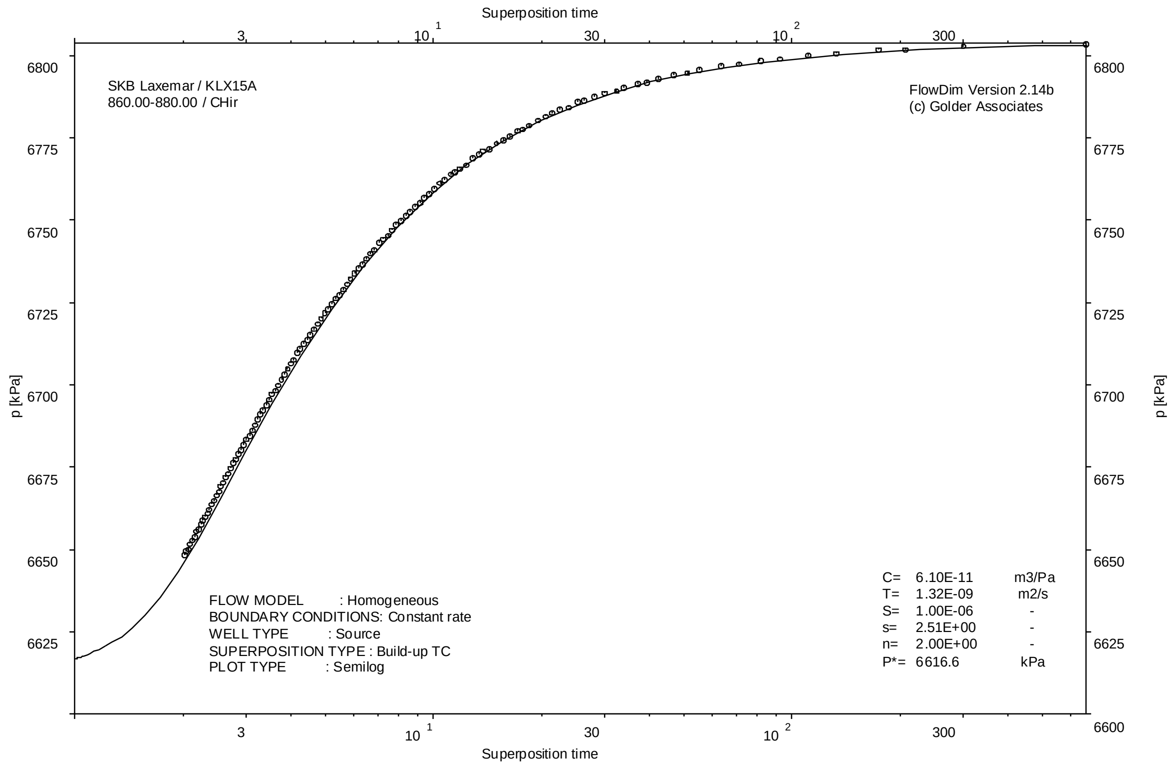
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

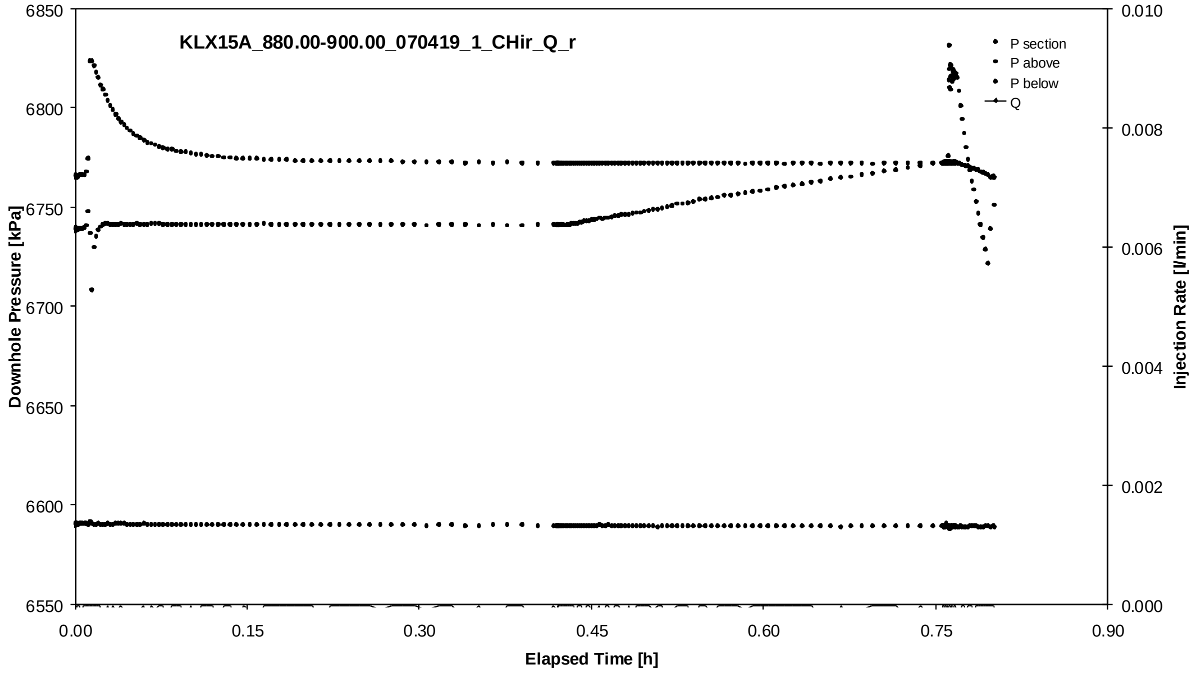


CHIR phase; HORNER match

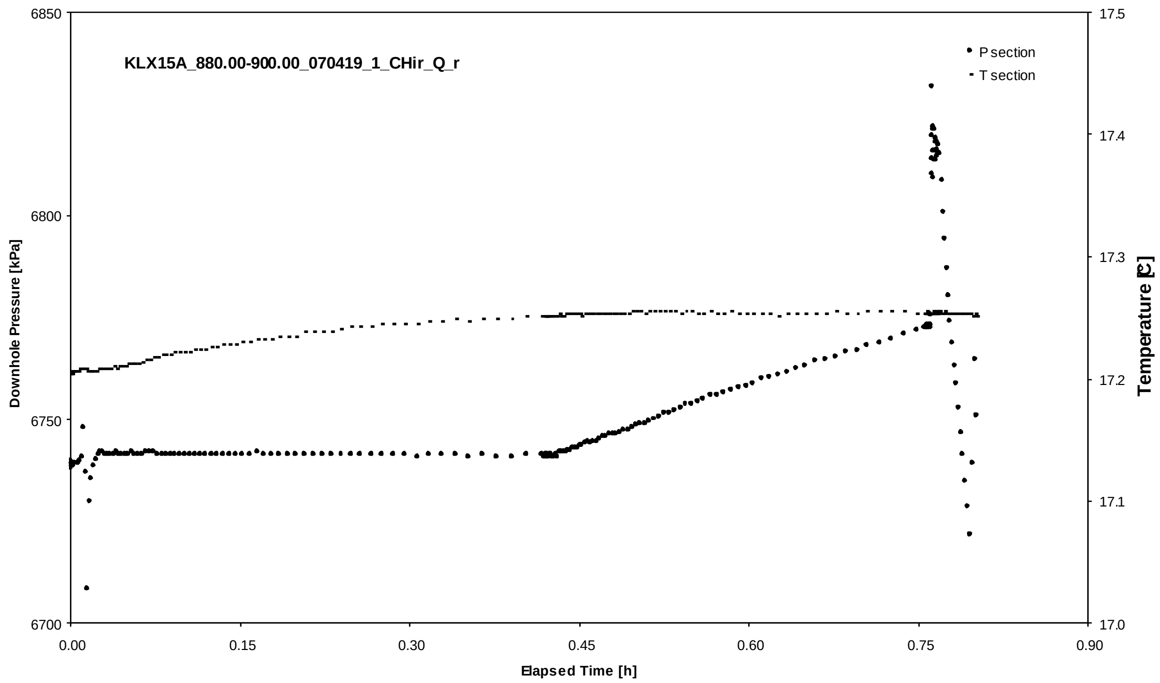
APPENDIX 2-49

Test 880.00 – 900.00 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

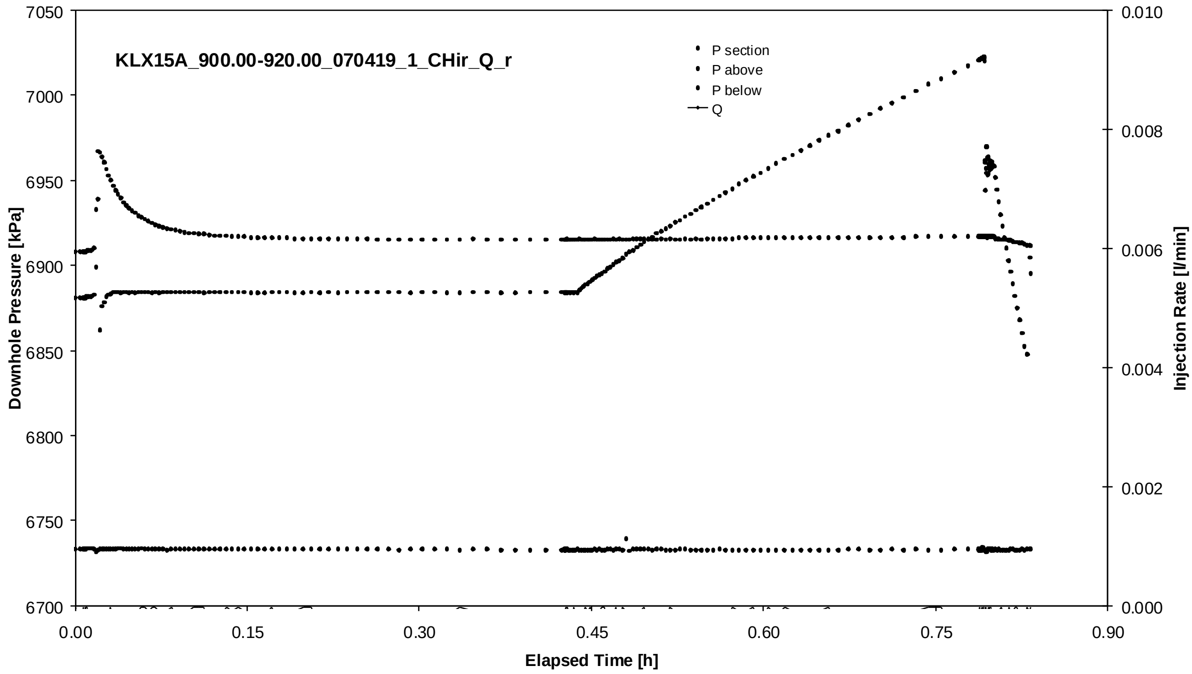
Not analysed

CHIR phase; HORNER match

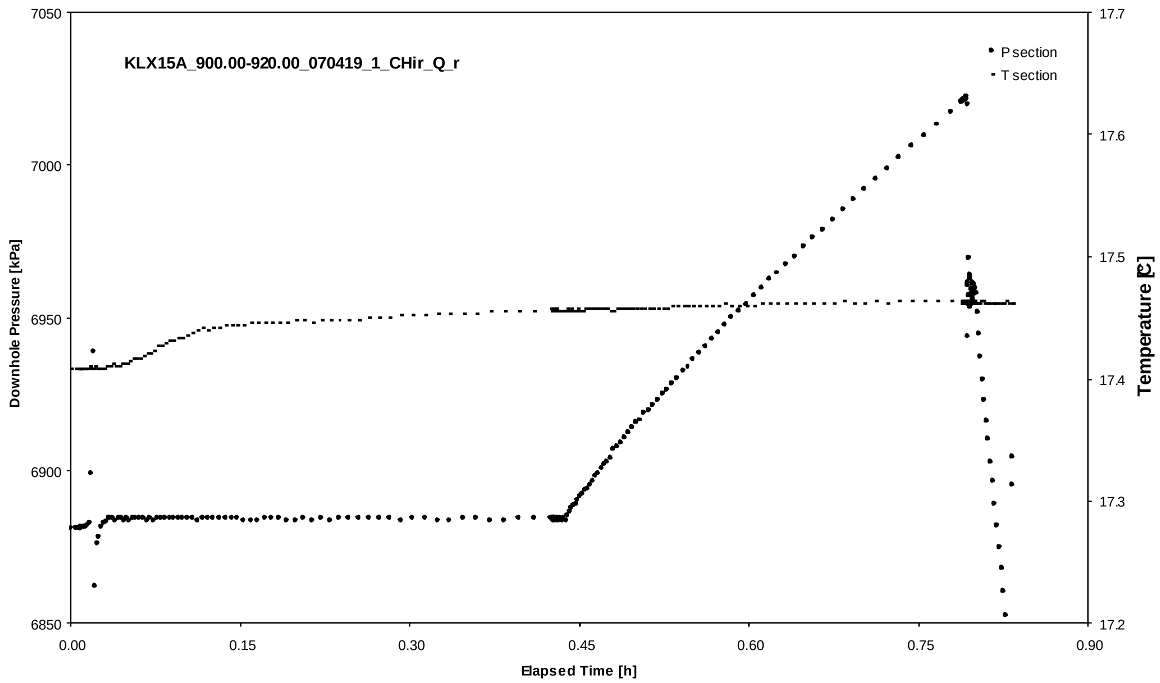
APPENDIX 2-50

Test 900.00 – 920.00 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

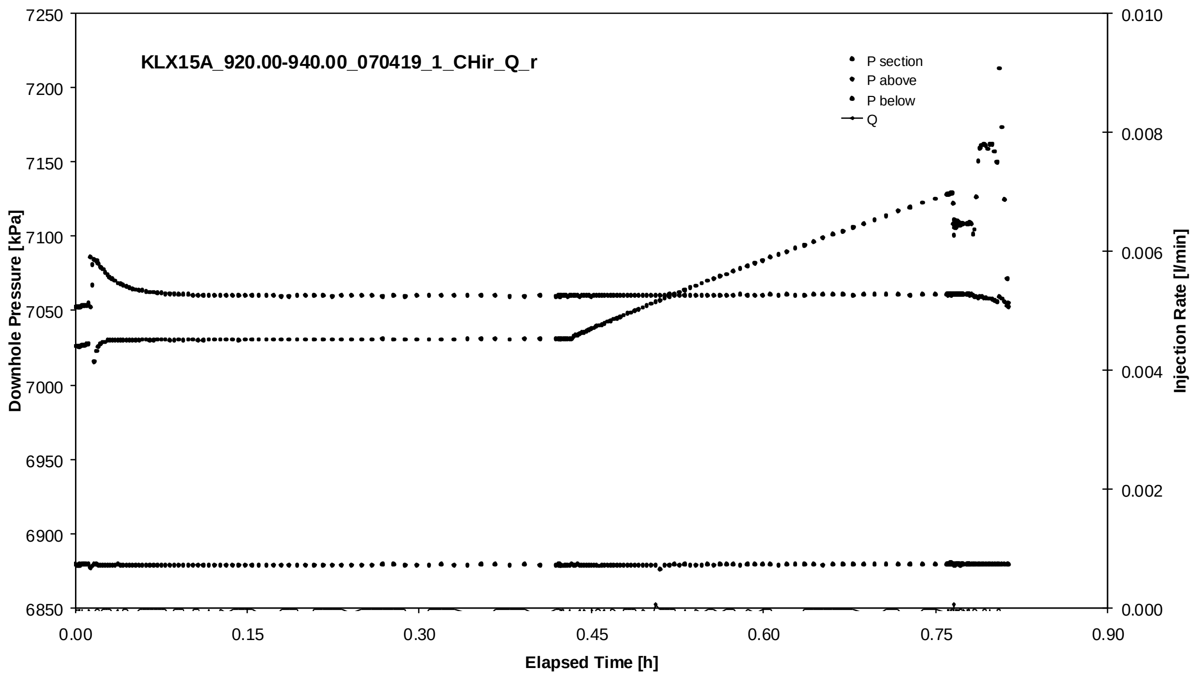
Not analysed

CHIR phase; HORNER match

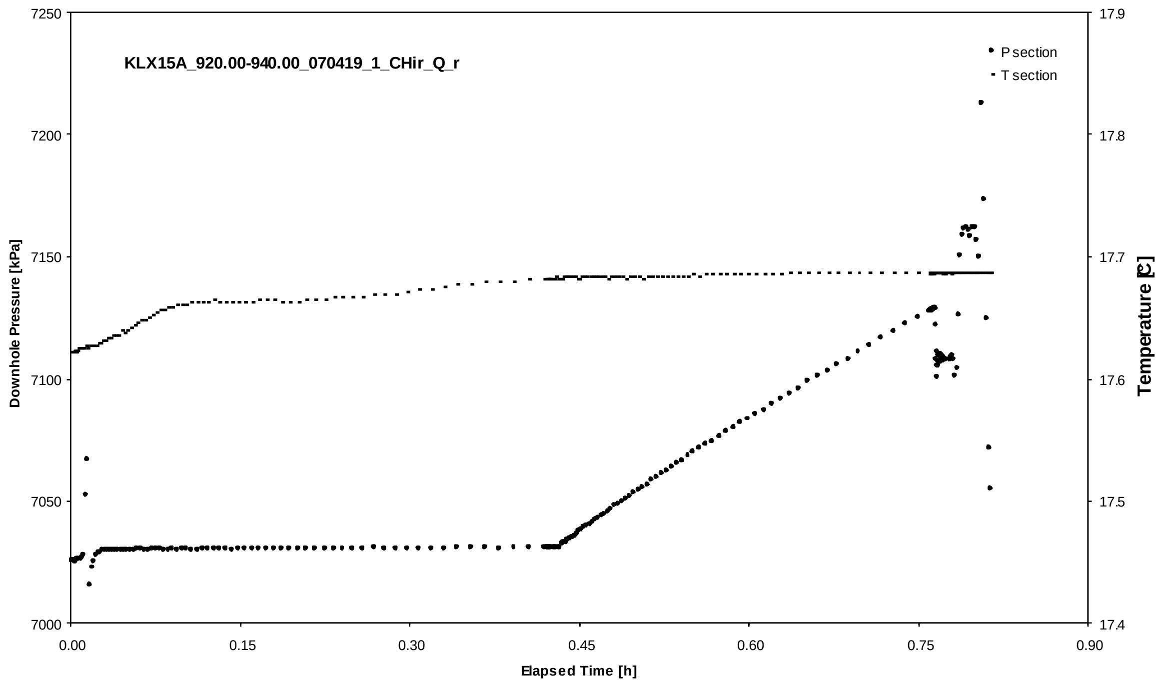
APPENDIX 2-51

Test 920.00 – 940.00 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

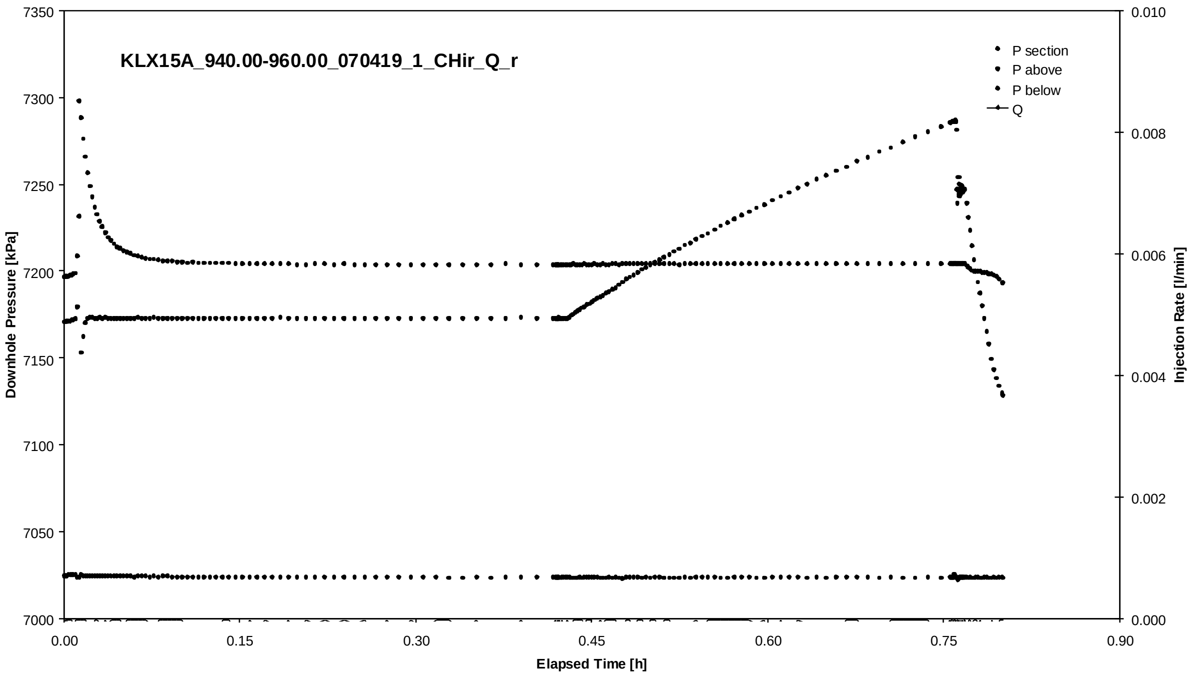
Not analysed

CHIR phase; HORNER match

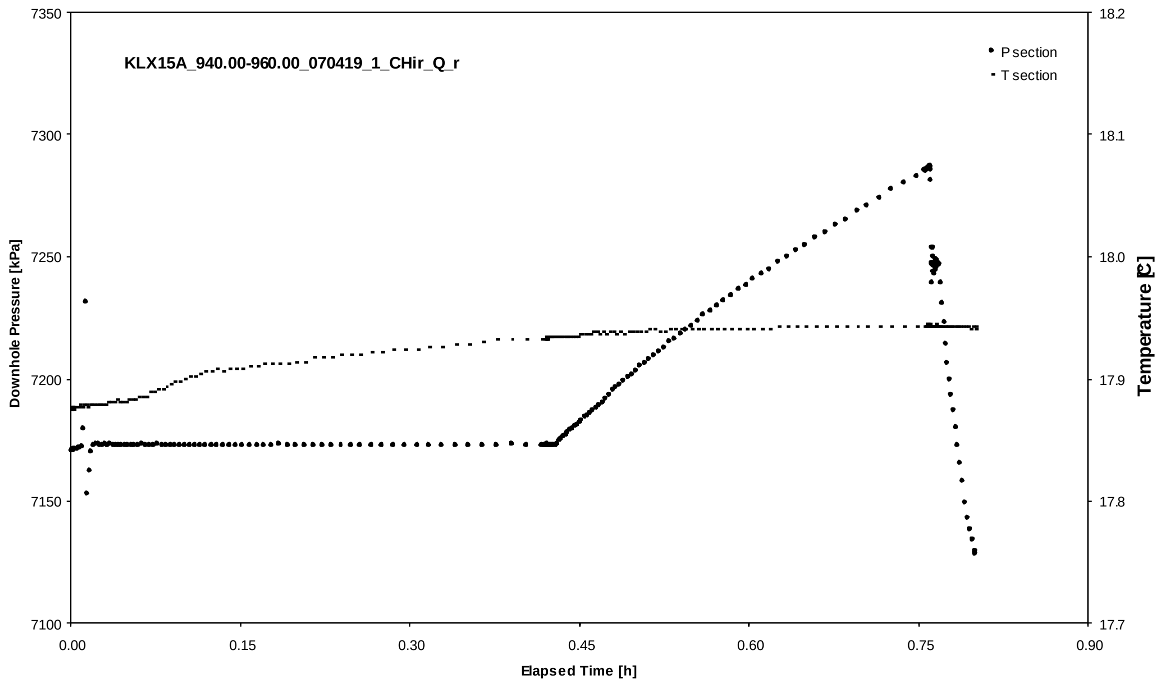
APPENDIX 2-52

Test 940.00 – 960.00 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

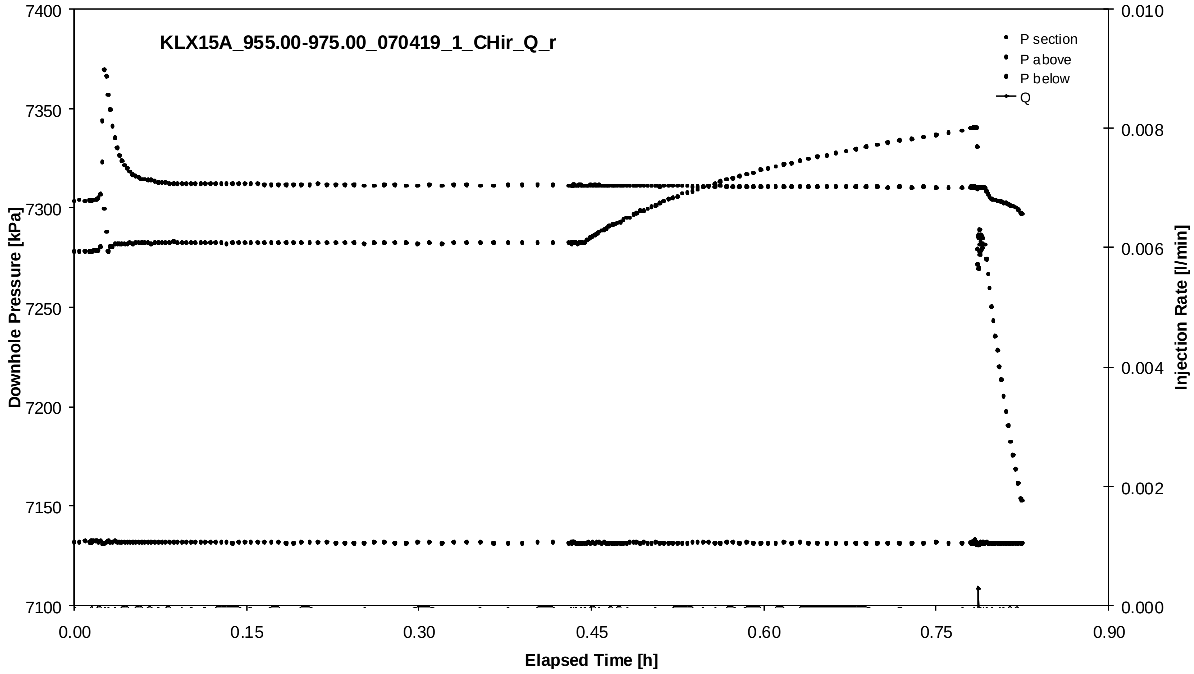
Not analysed

CHIR phase; HORNER match

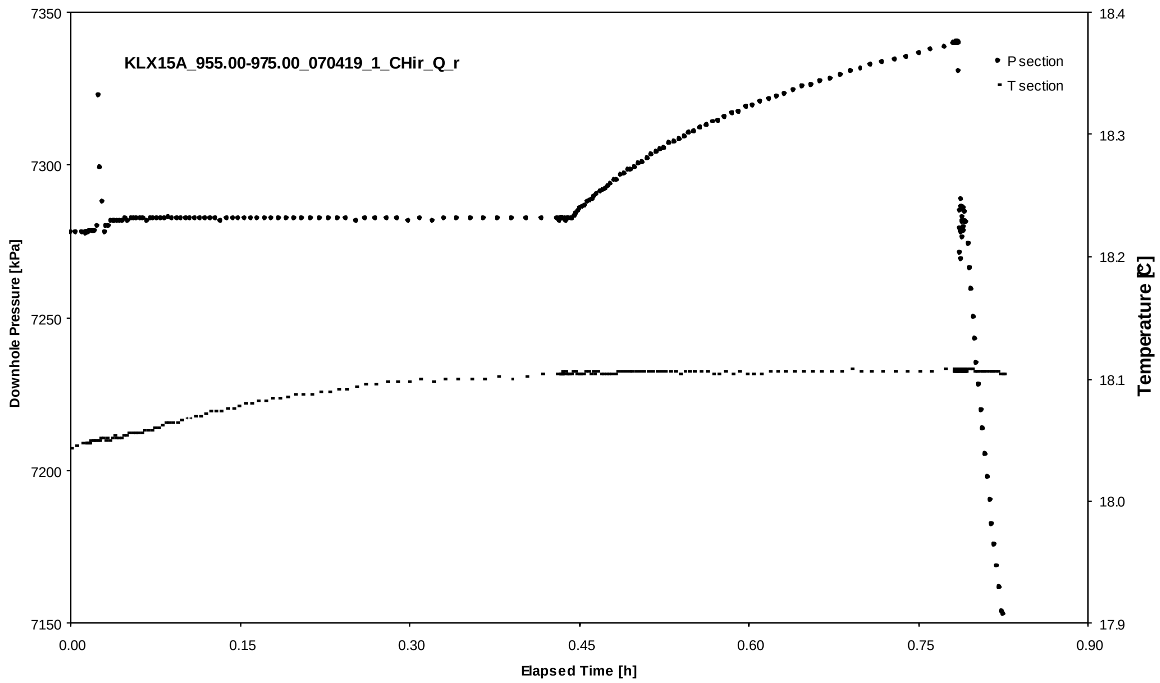
APPENDIX 2-53

Test 955.00 – 975.00 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

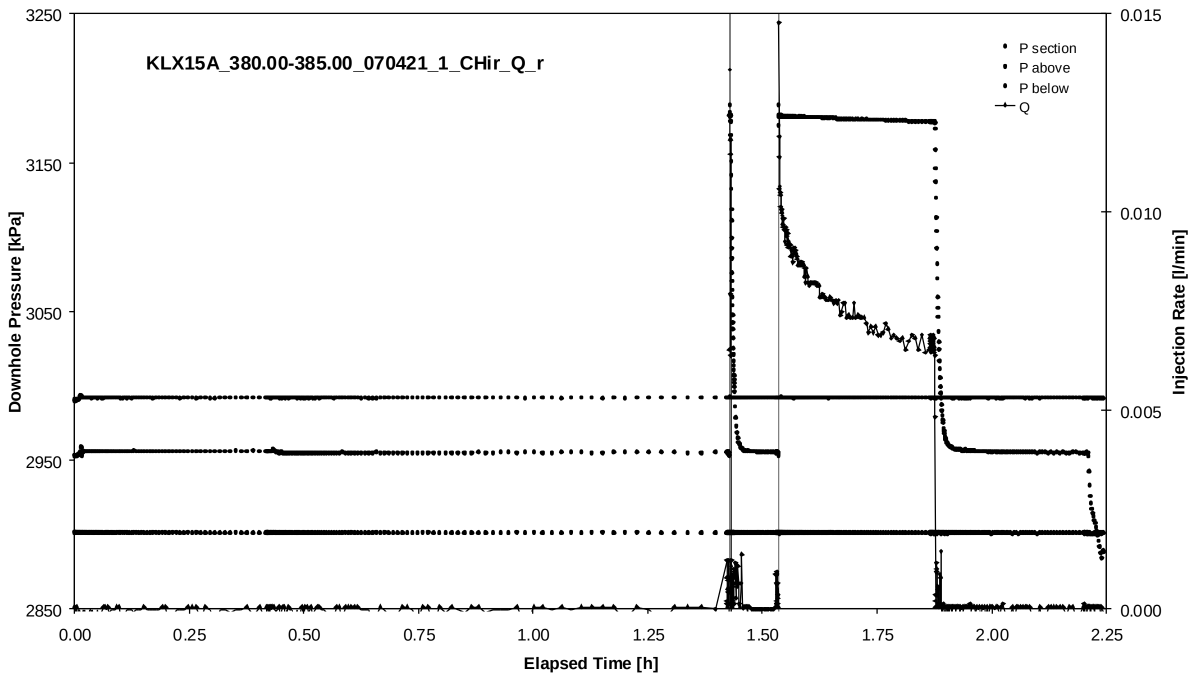
Not analysed

CHIR phase; HORNER match

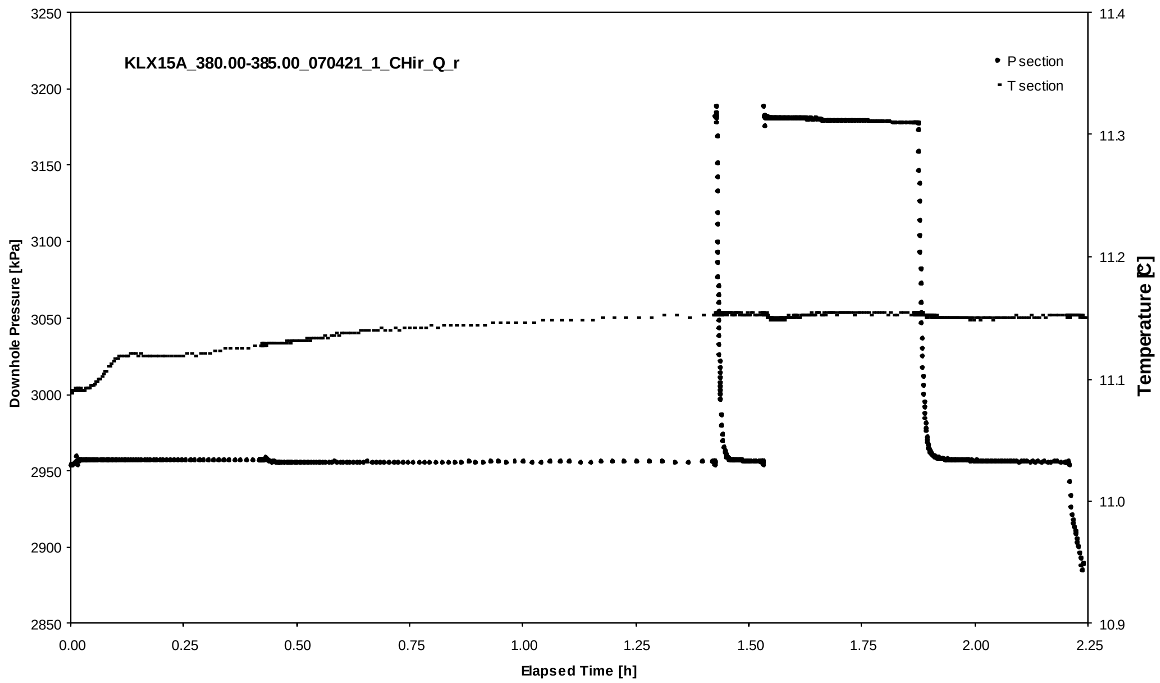
APPENDIX 2-54

Test 380.00 – 385.00 m

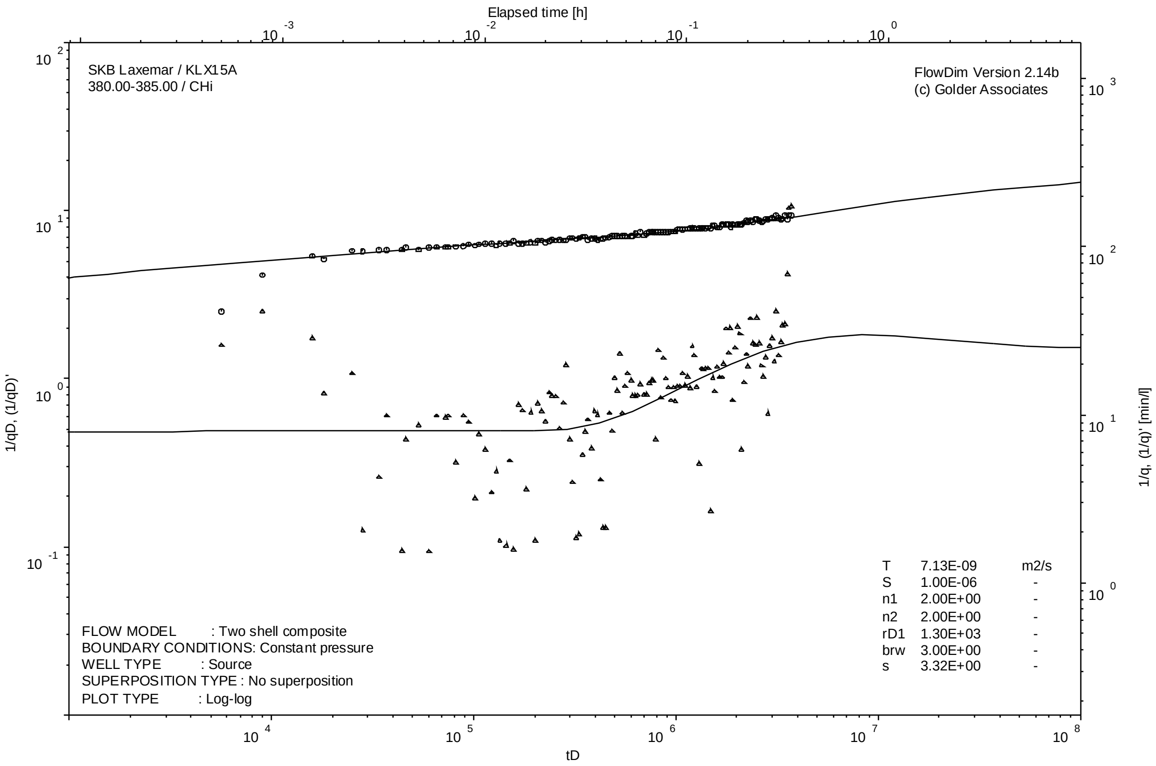
Analysis diagrams



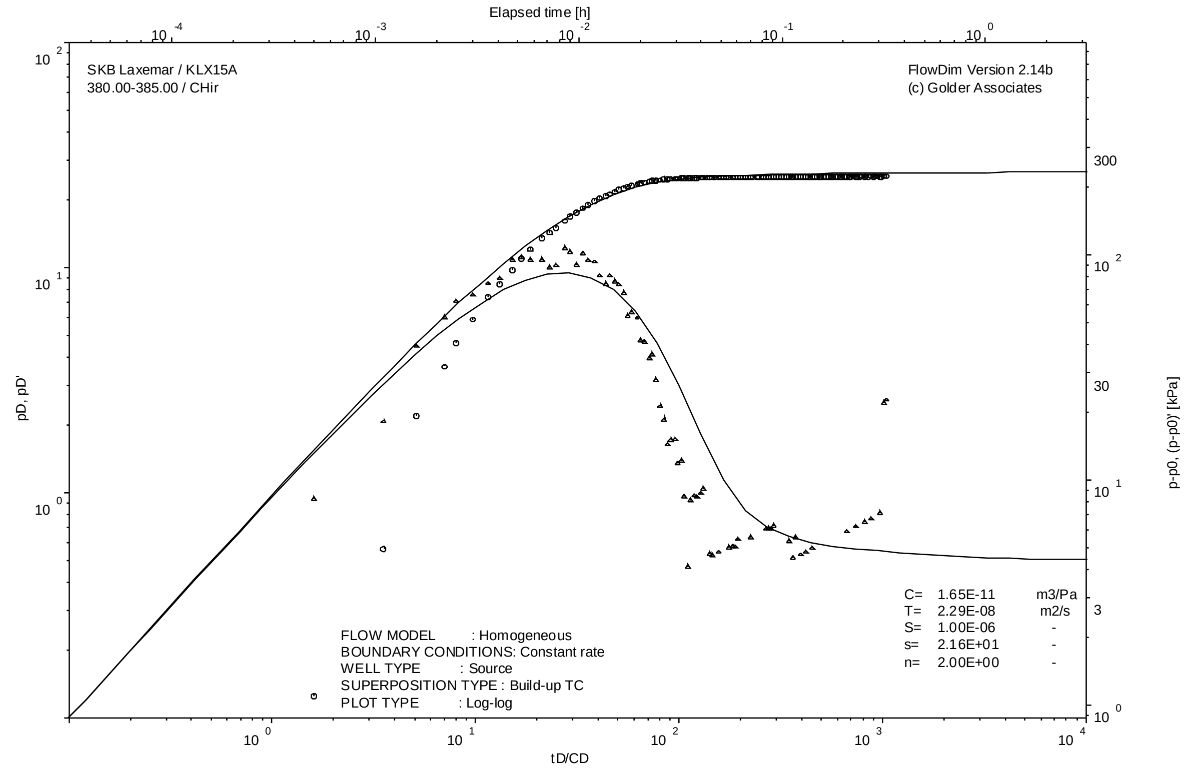
Pressure and flow rate vs. time; cartesian plot



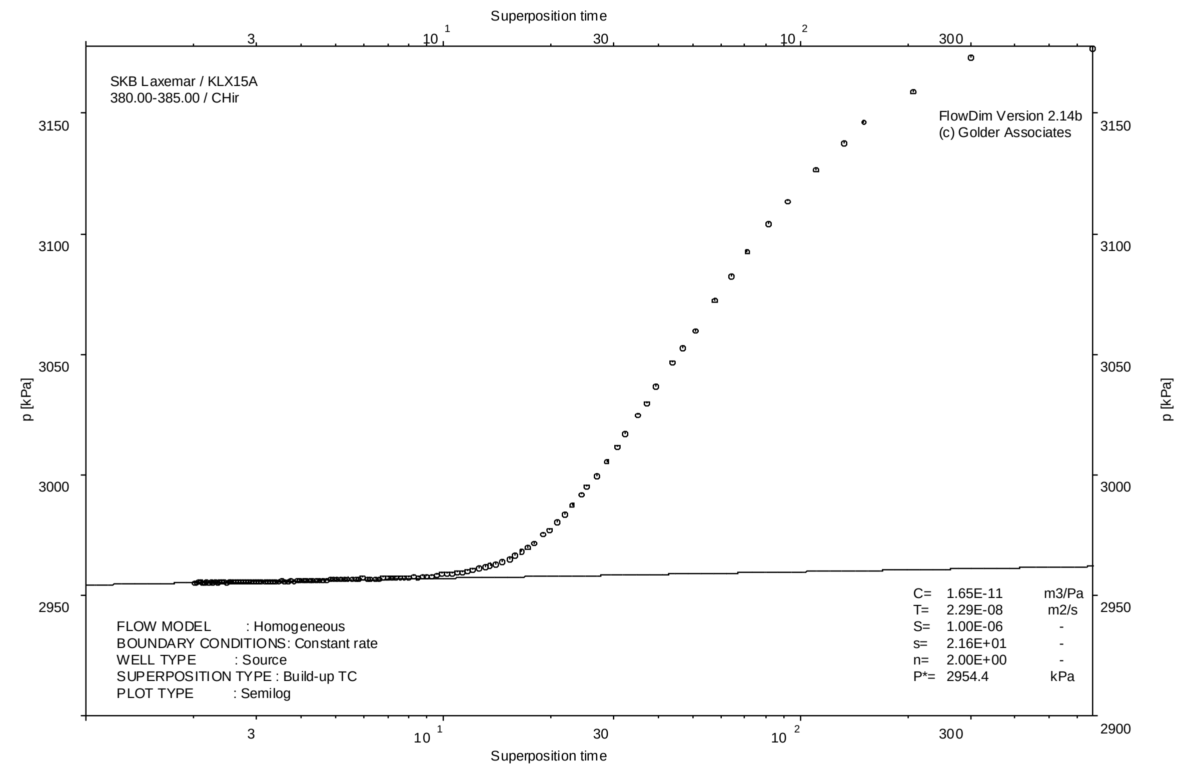
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

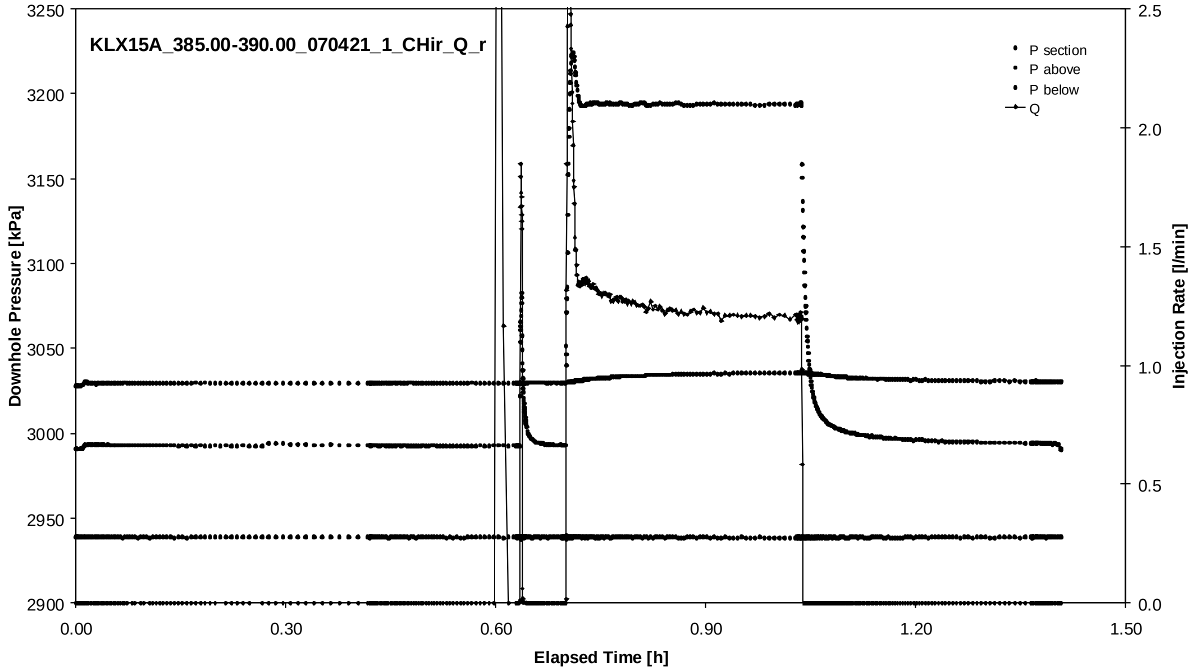


CHIR phase; HORNER match

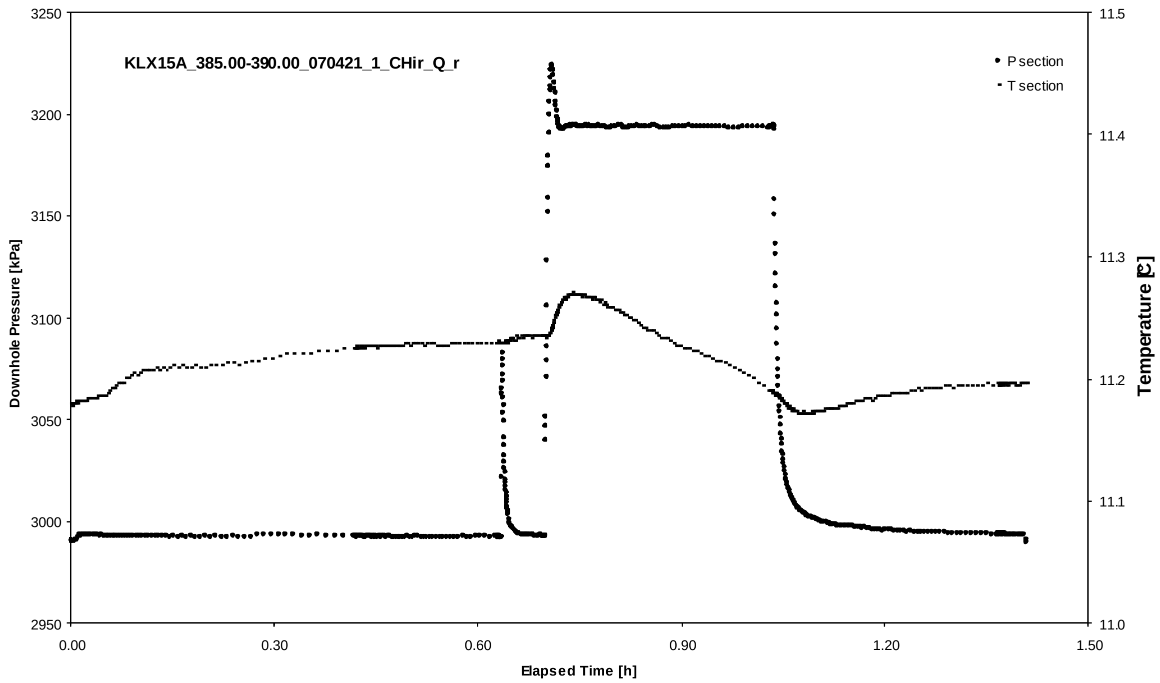
APPENDIX 2-55

Test 385.00 – 390.00 m

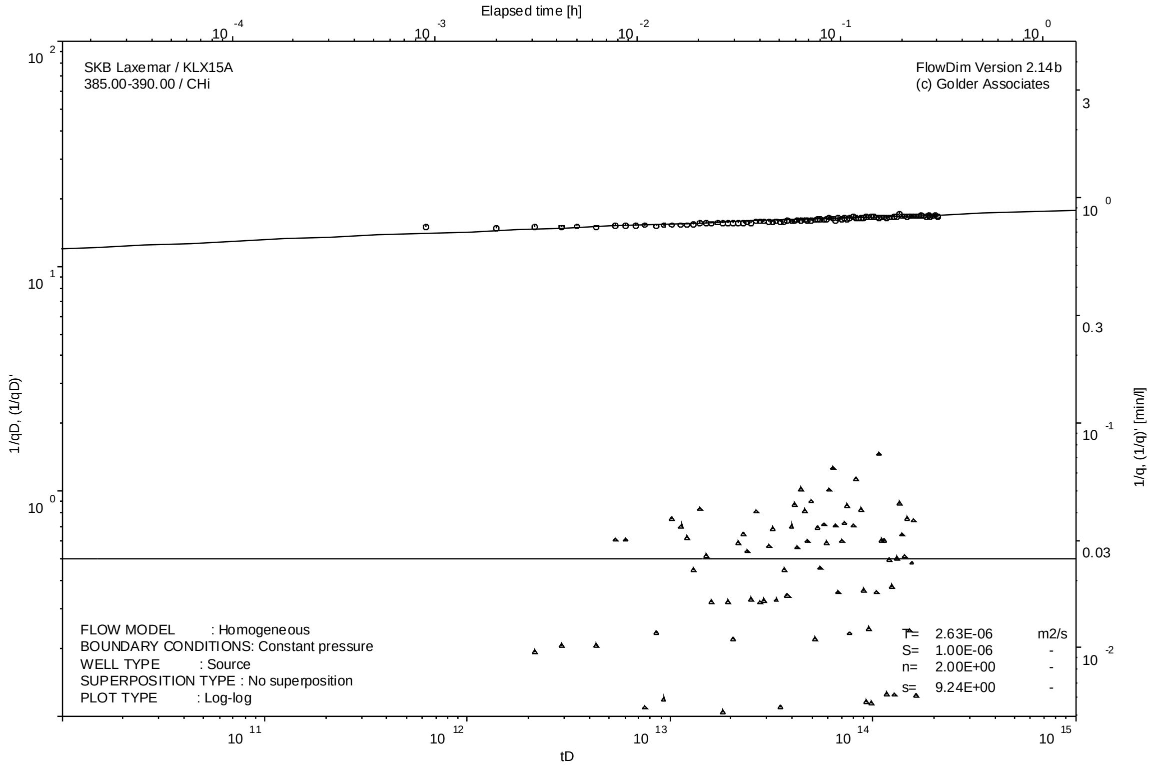
Analysis diagrams



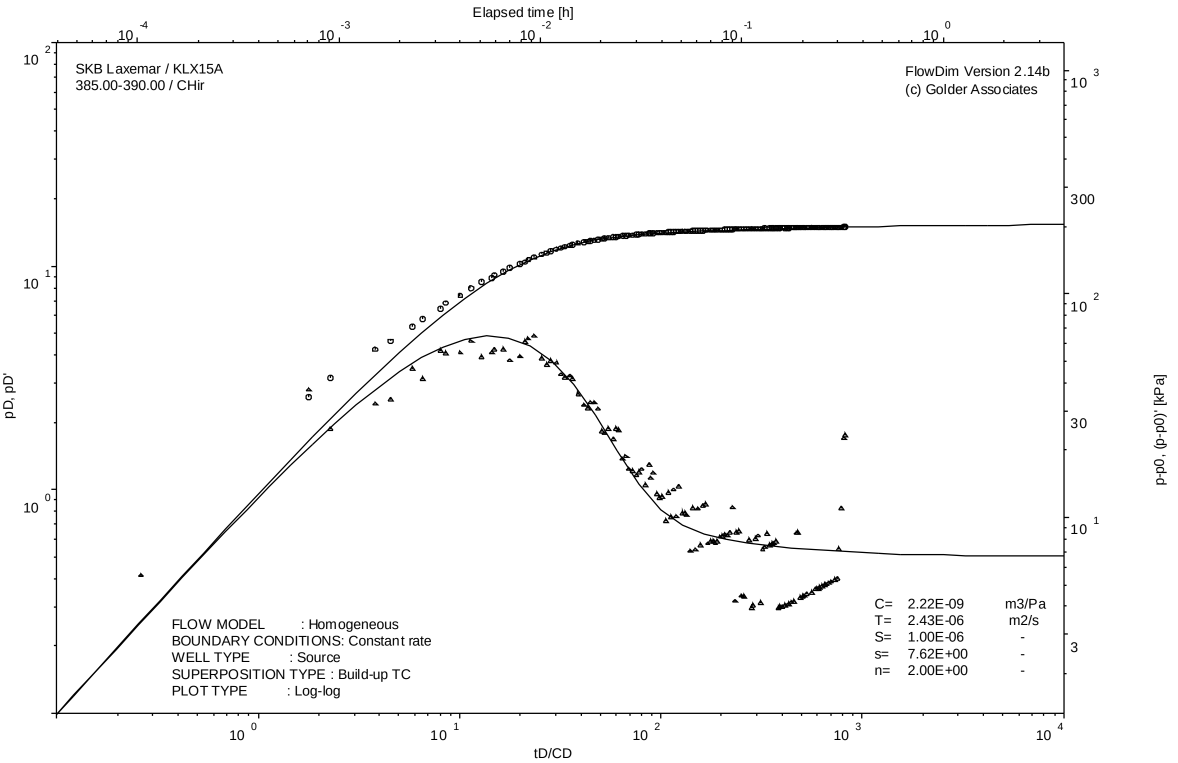
Pressure and flow rate vs. time; cartesian plot



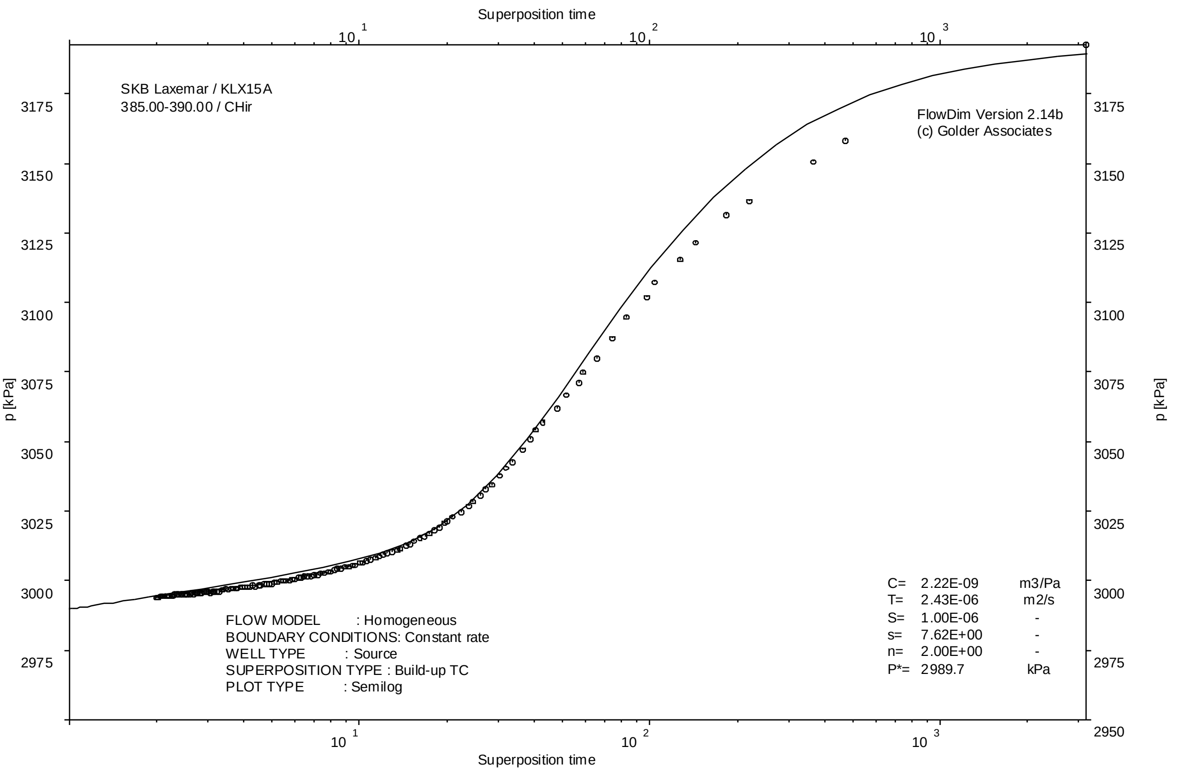
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

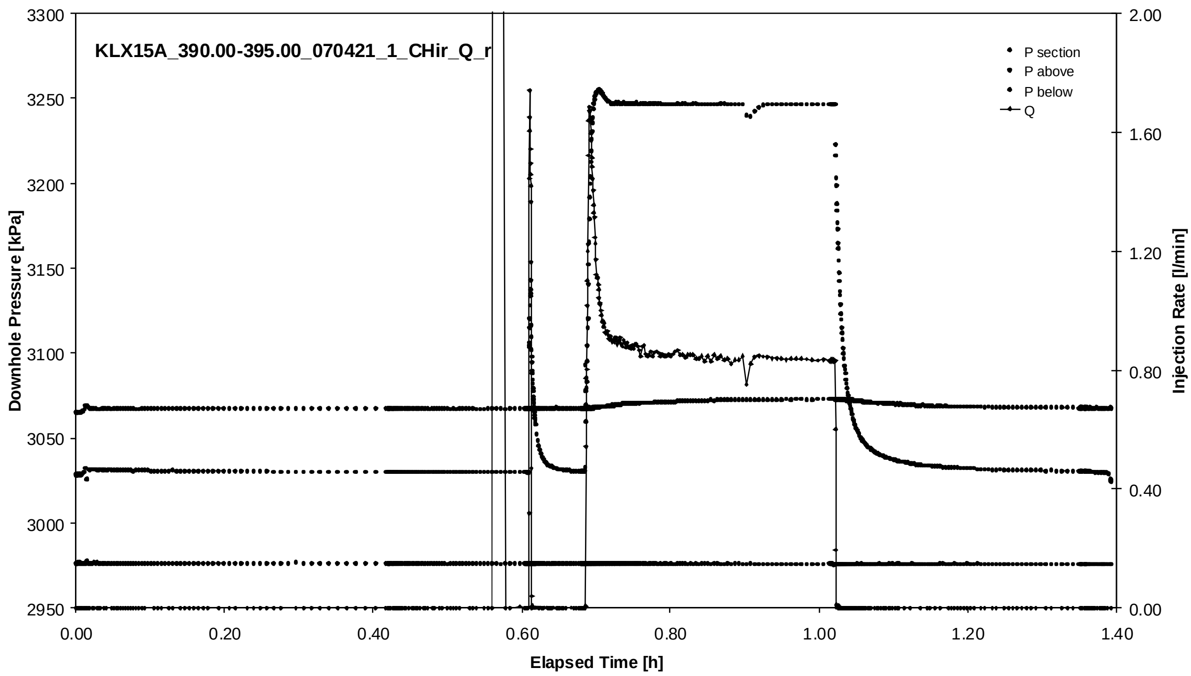


CHIR phase; HORNER match

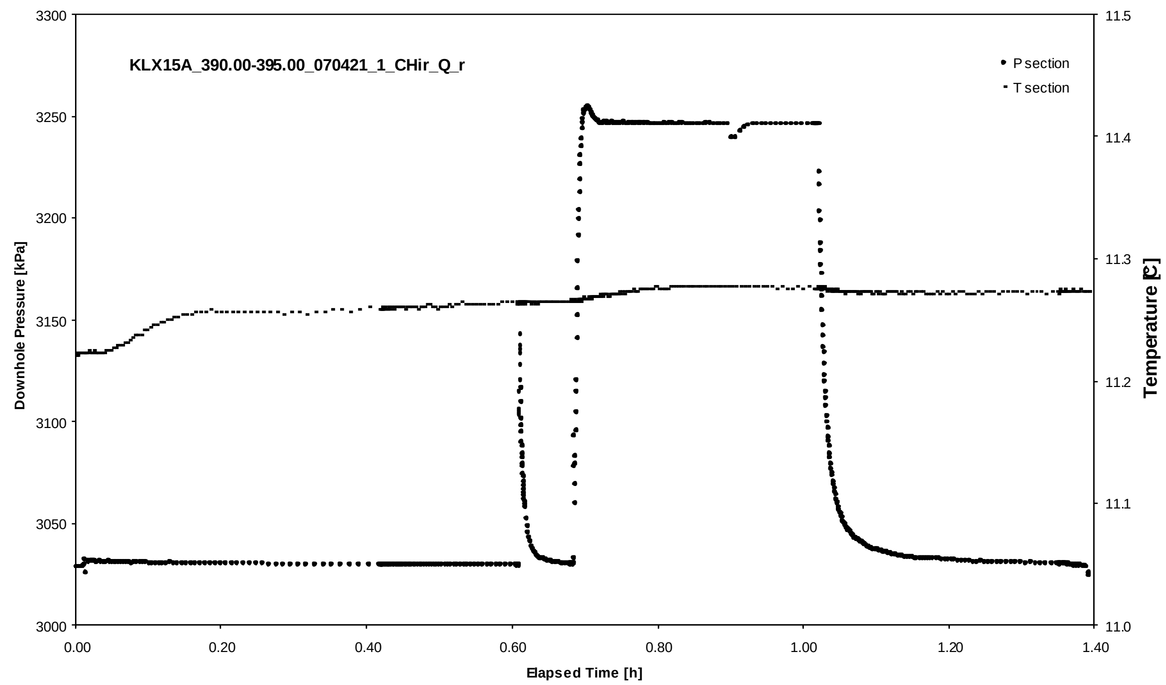
APPENDIX 2-56

Test 390.00 – 395.00 m

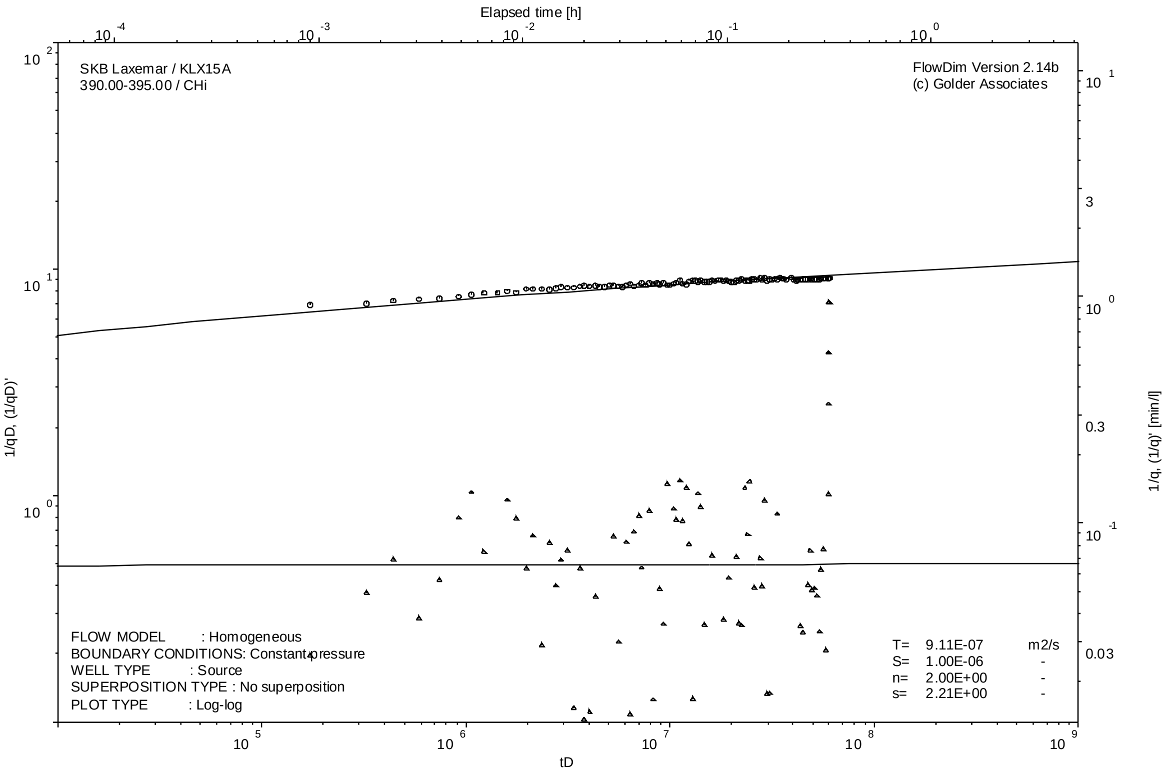
Analysis diagrams



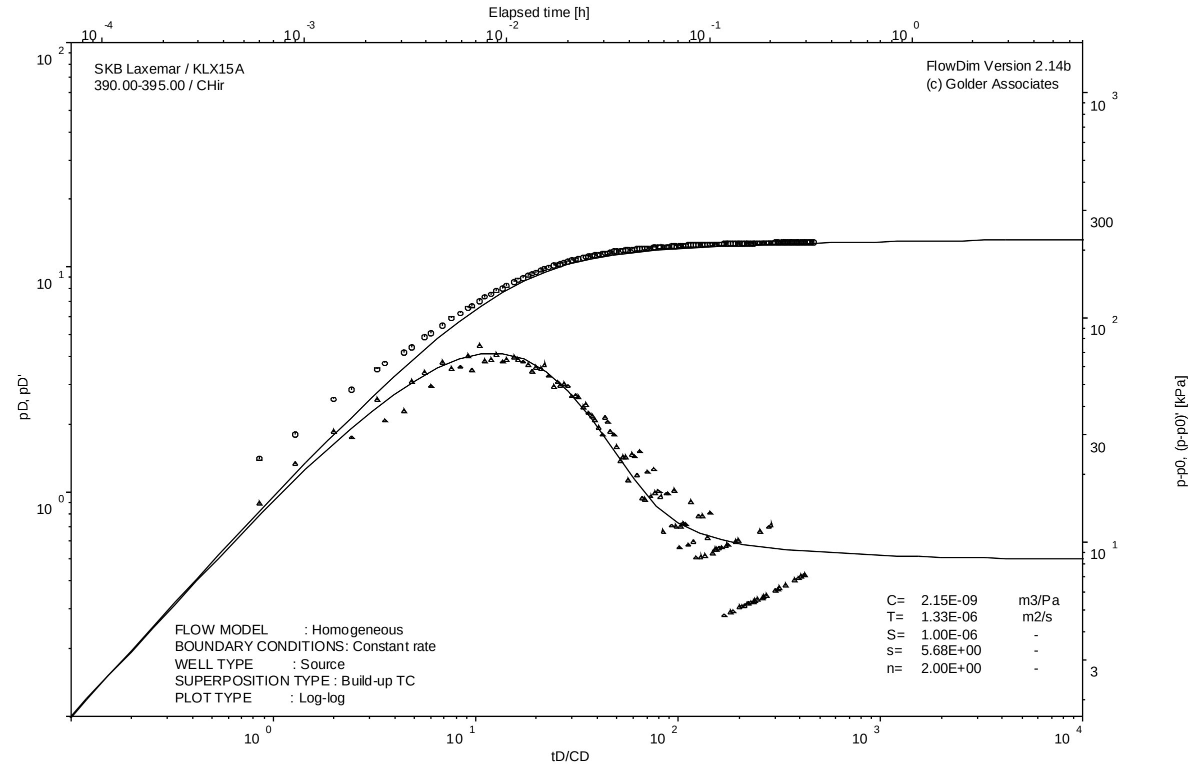
Pressure and flow rate vs. time; cartesian plot



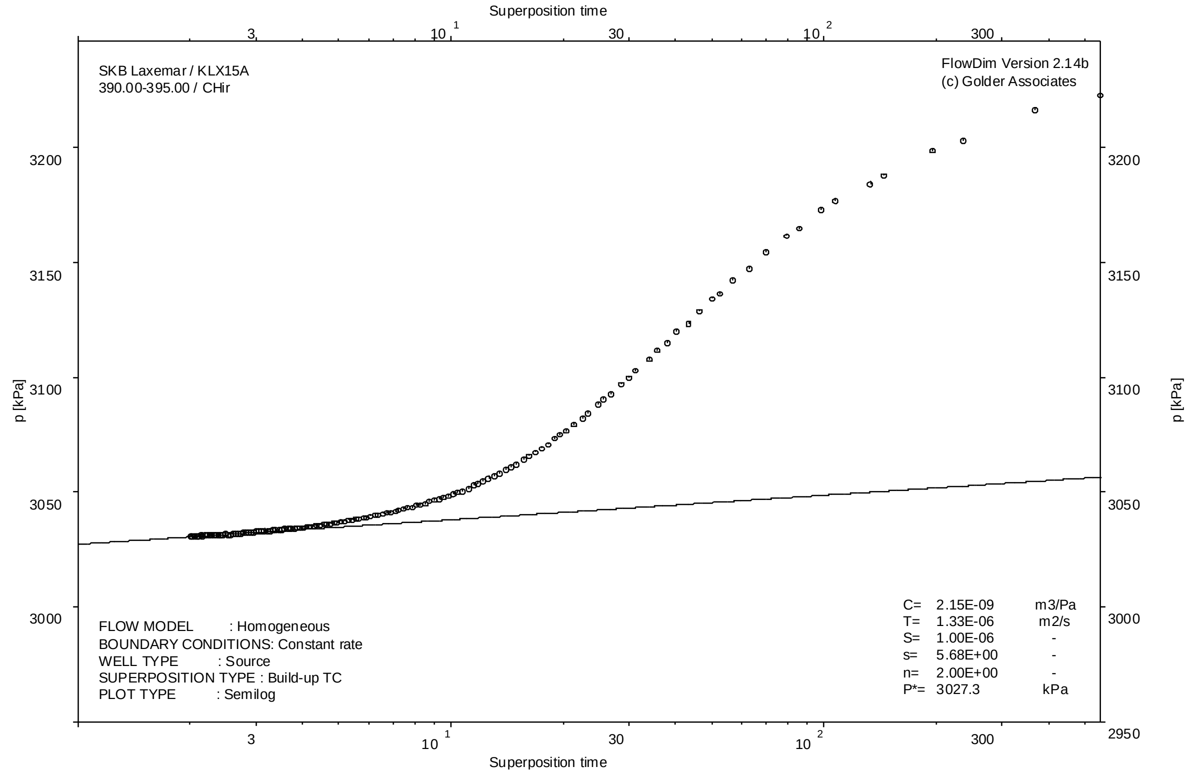
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

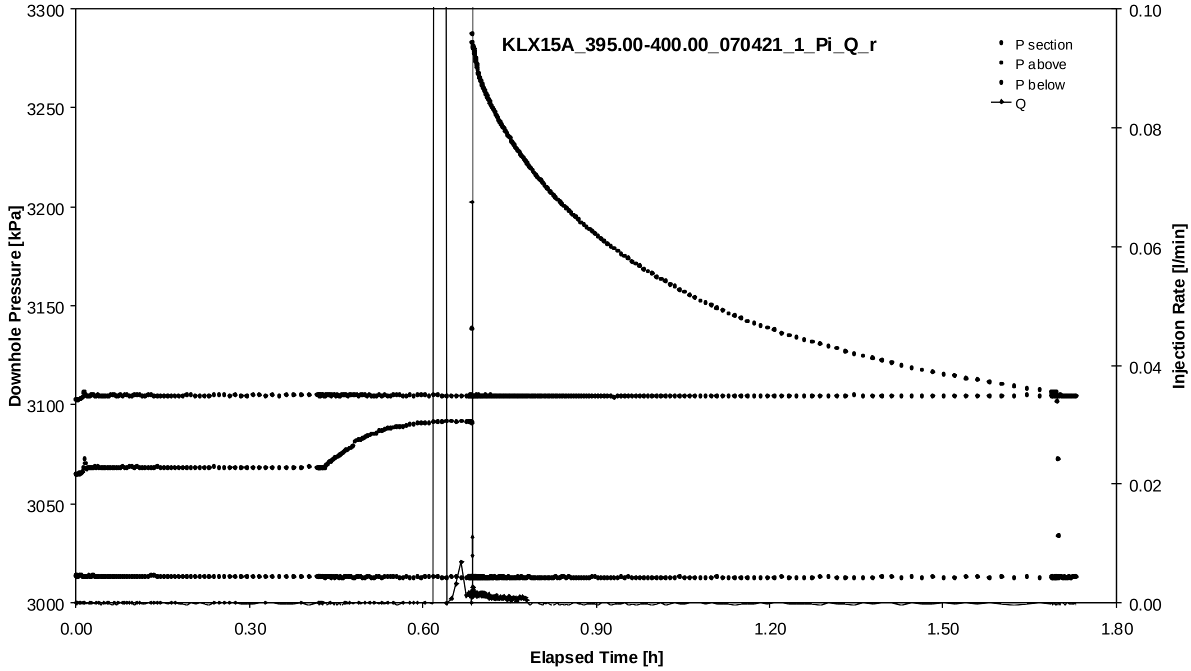


CHIR phase; HORNER match

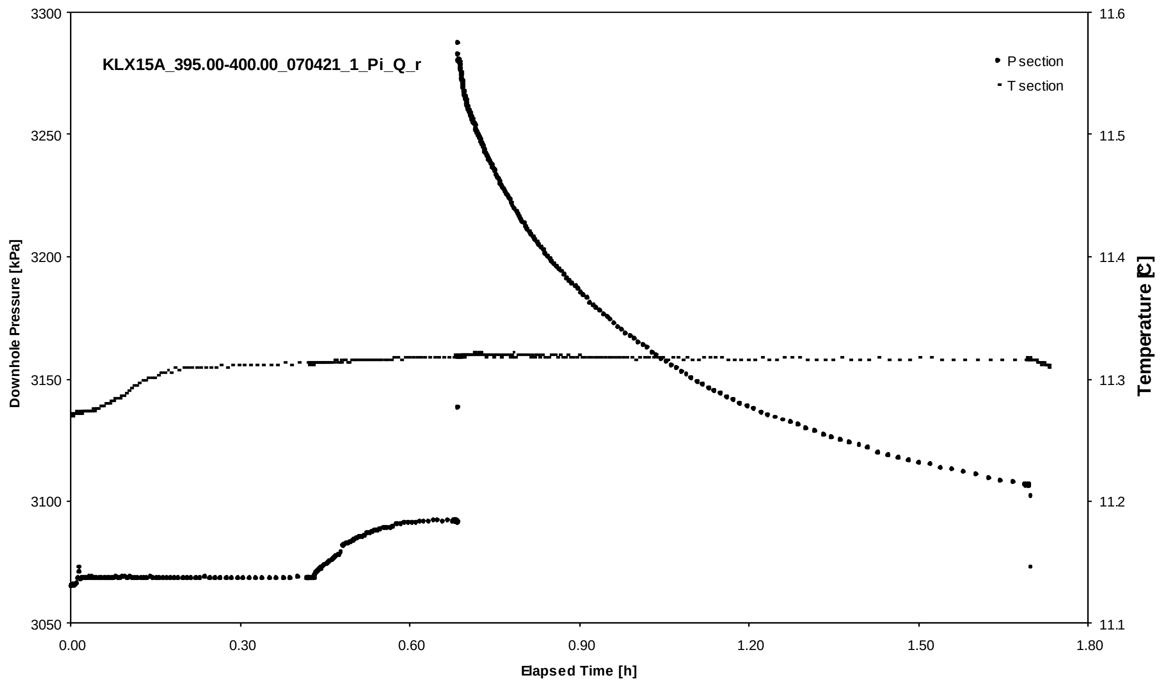
APPENDIX 2-57

Test 395.00 – 400.00 m

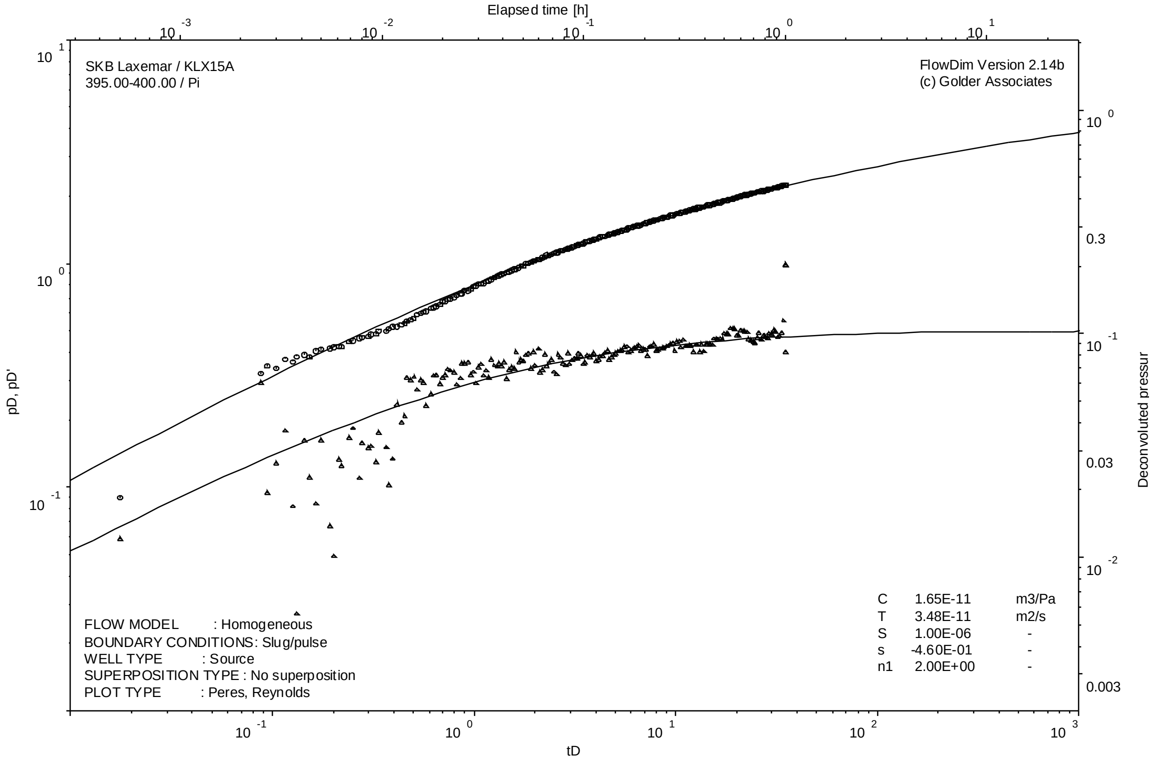
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

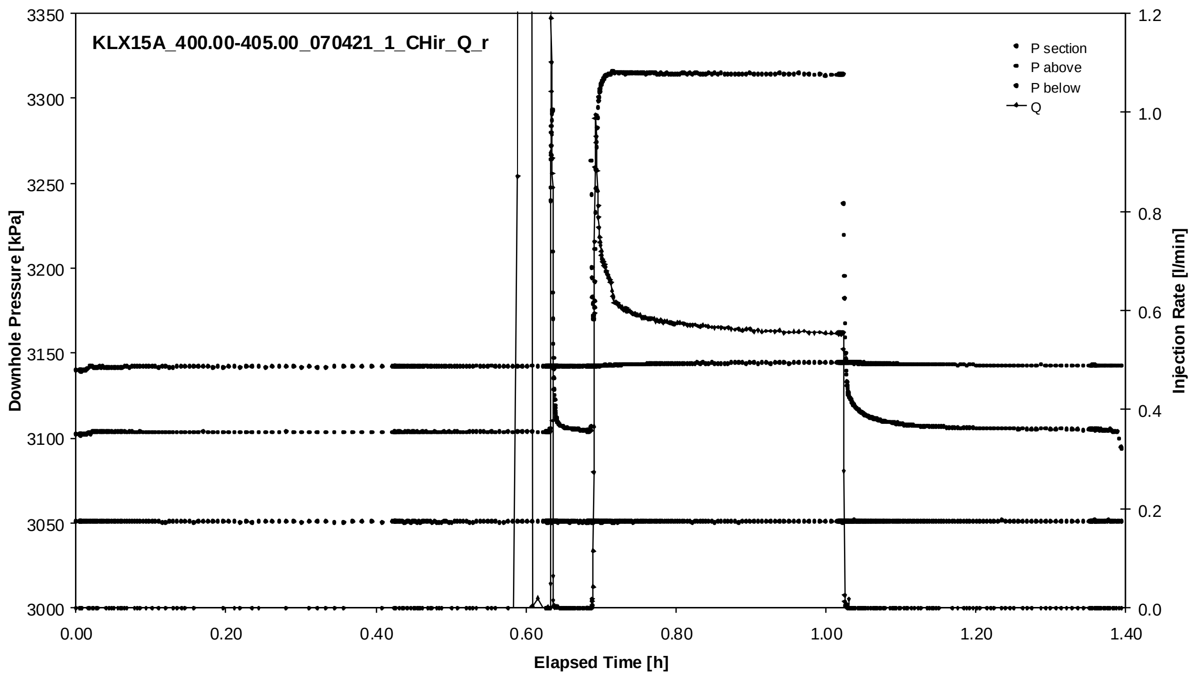


Pulse injection; deconvolution match

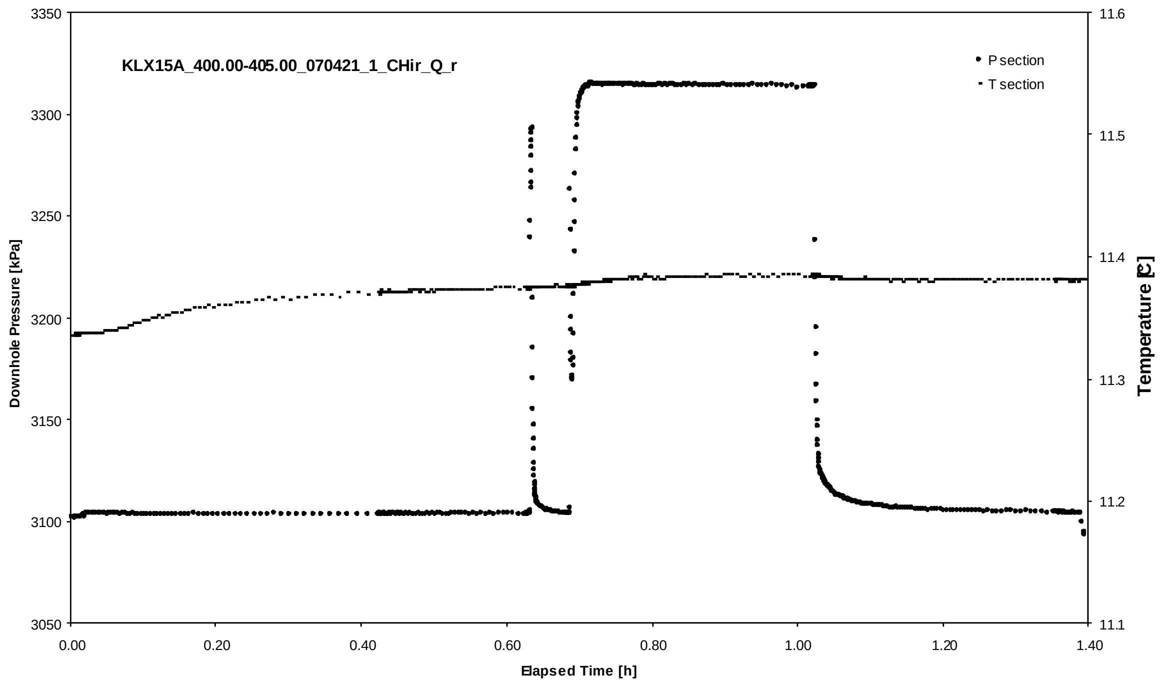
APPENDIX 2-58

Test 400.00 – 405.00 m

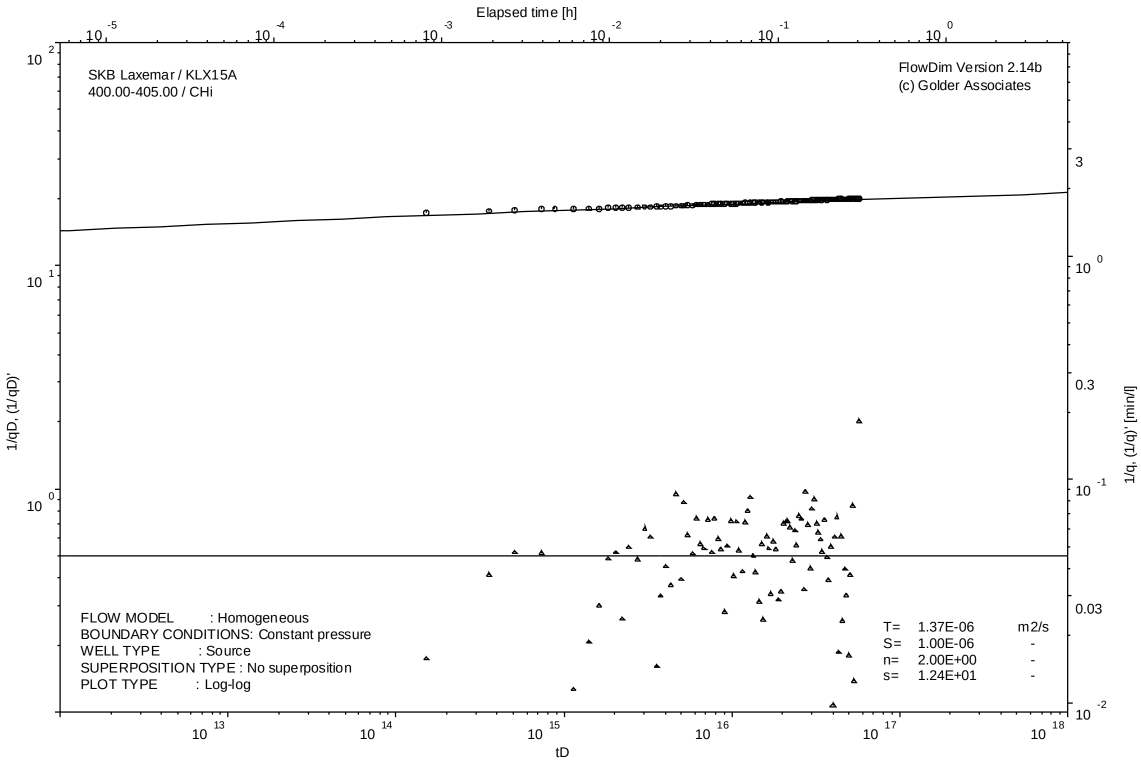
Analysis diagrams



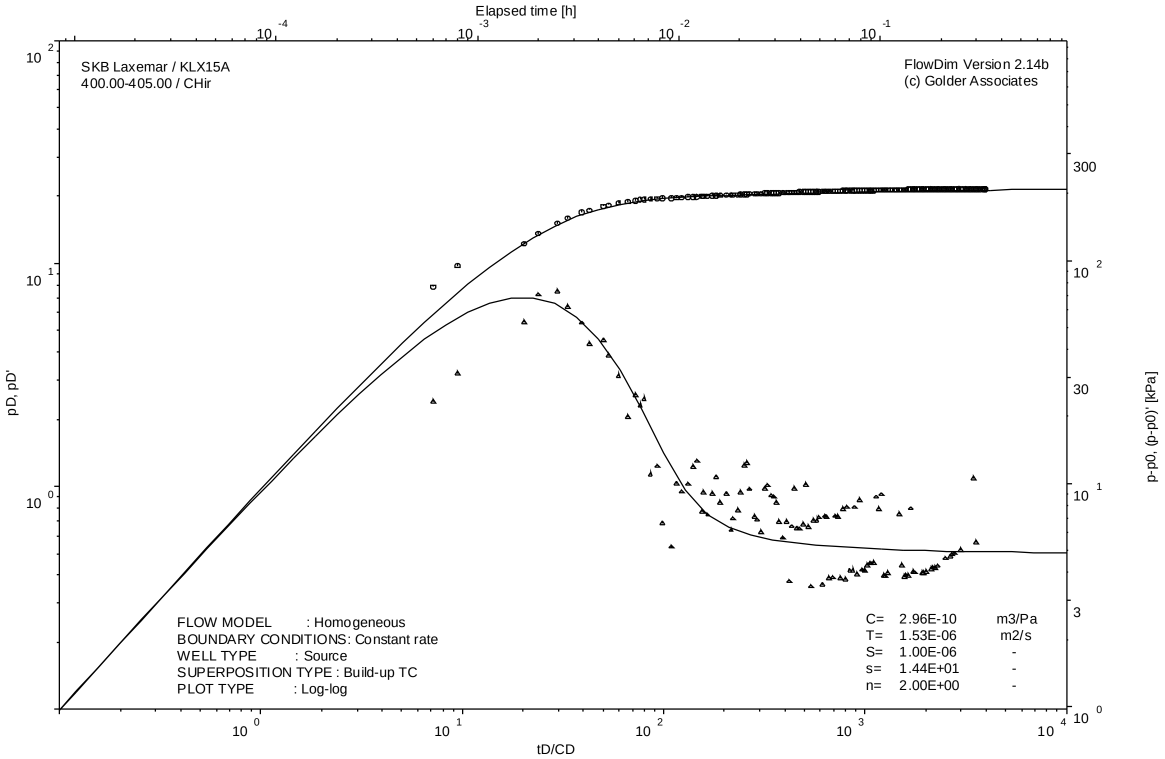
Pressure and flow rate vs. time; cartesian plot



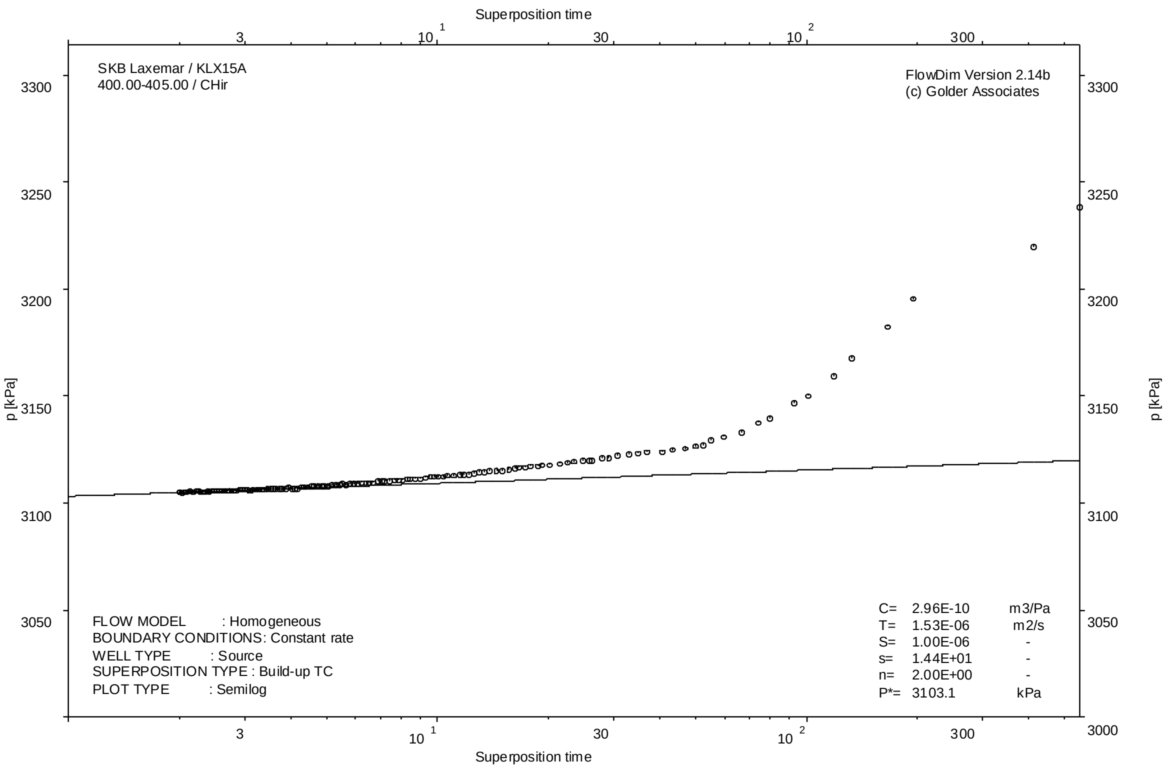
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

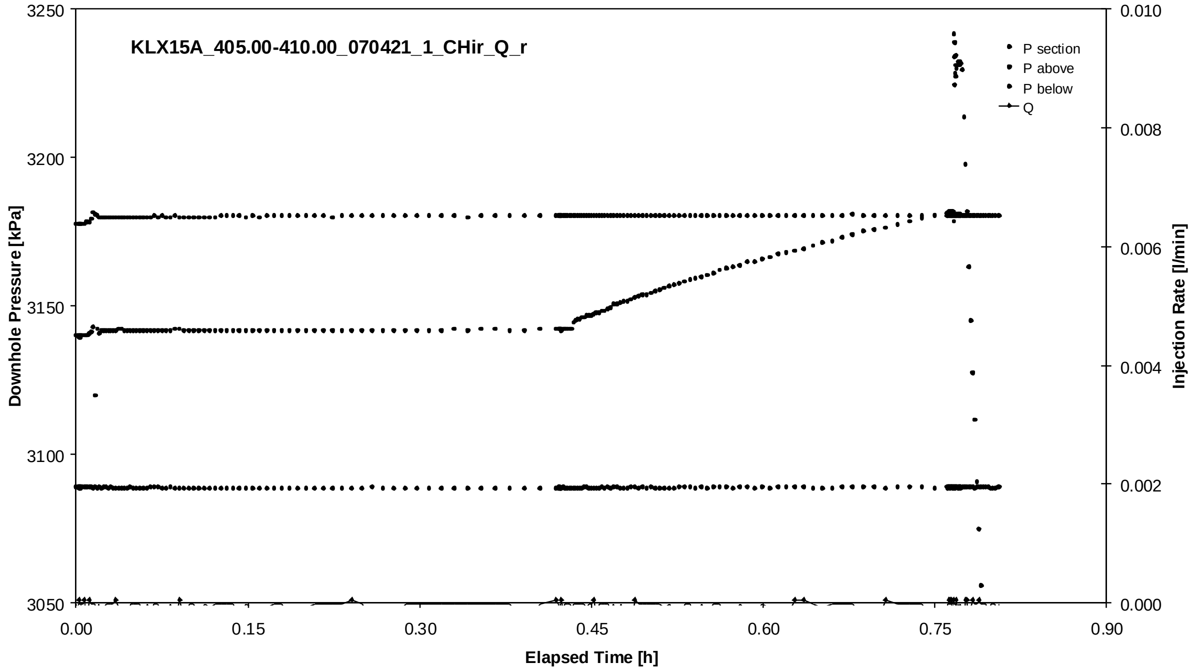


CHIR phase; HORNER match

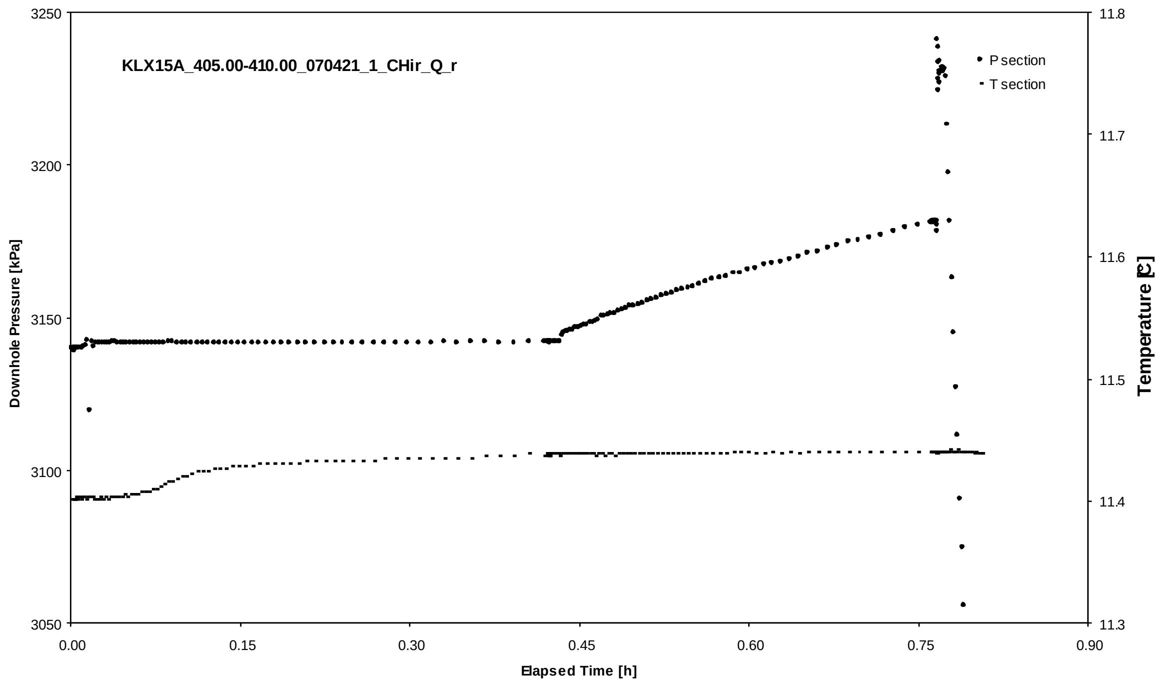
APPENDIX 2-59

Test 405.00 – 410.00 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

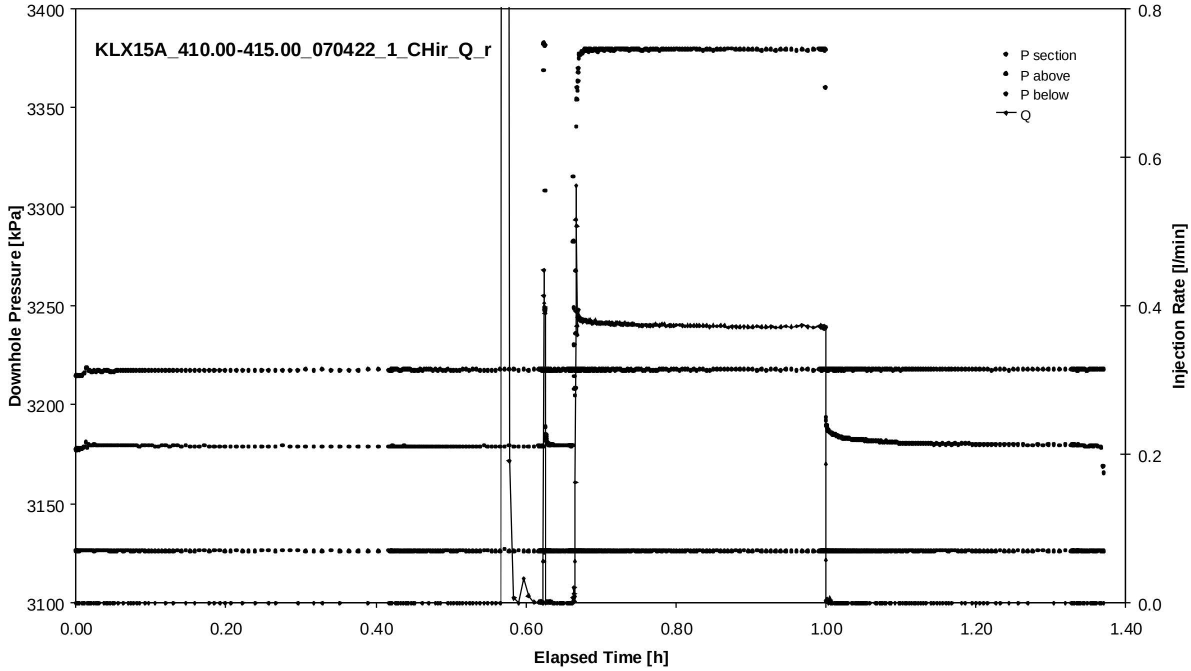
Not analysed

CHIR phase; HORNER match

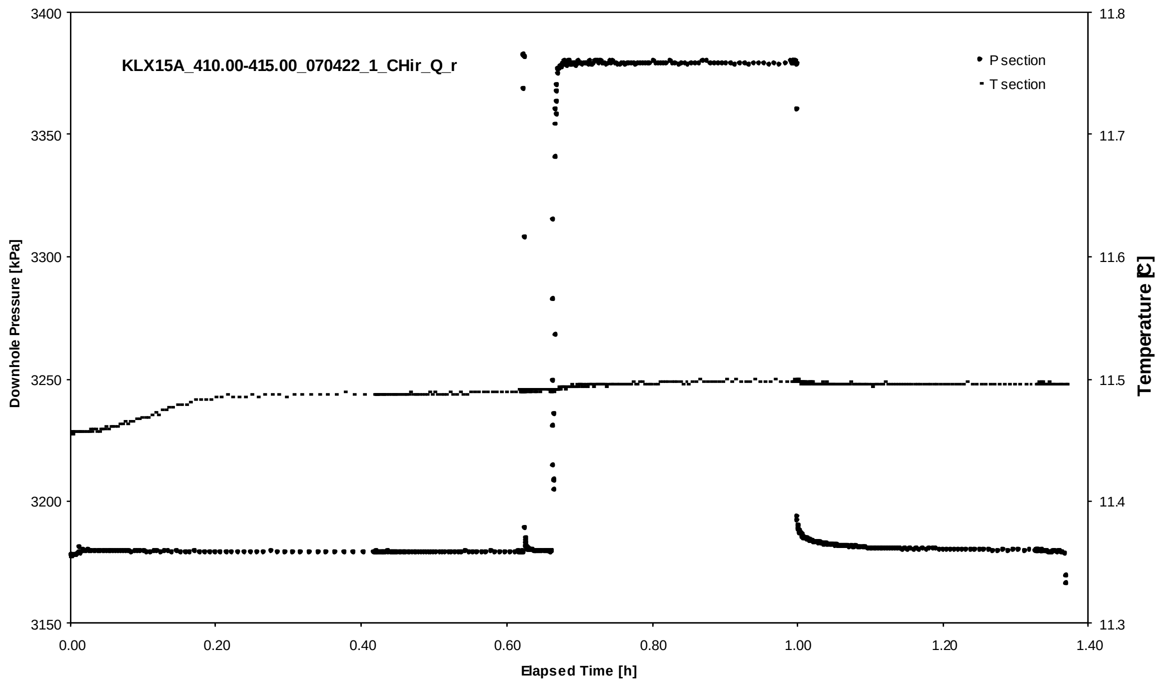
APPENDIX 2-60

Test 410.00 – 415.00 m

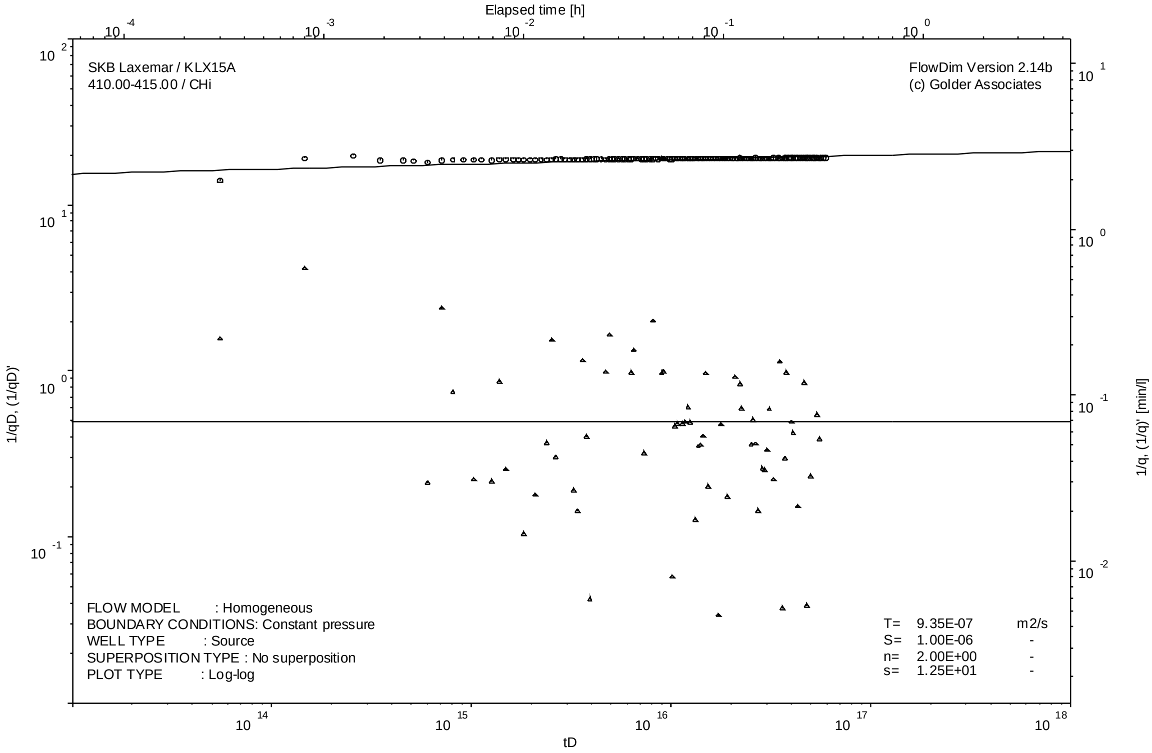
Analysis diagrams



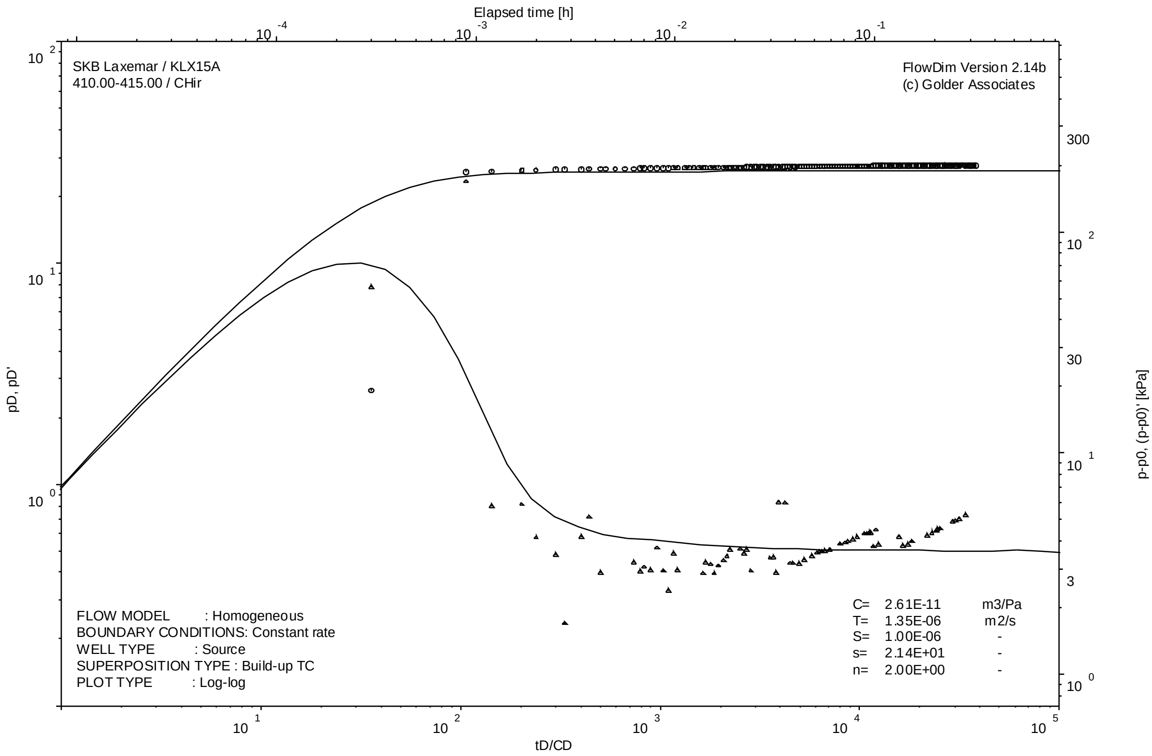
Pressure and flow rate vs. time; cartesian plot



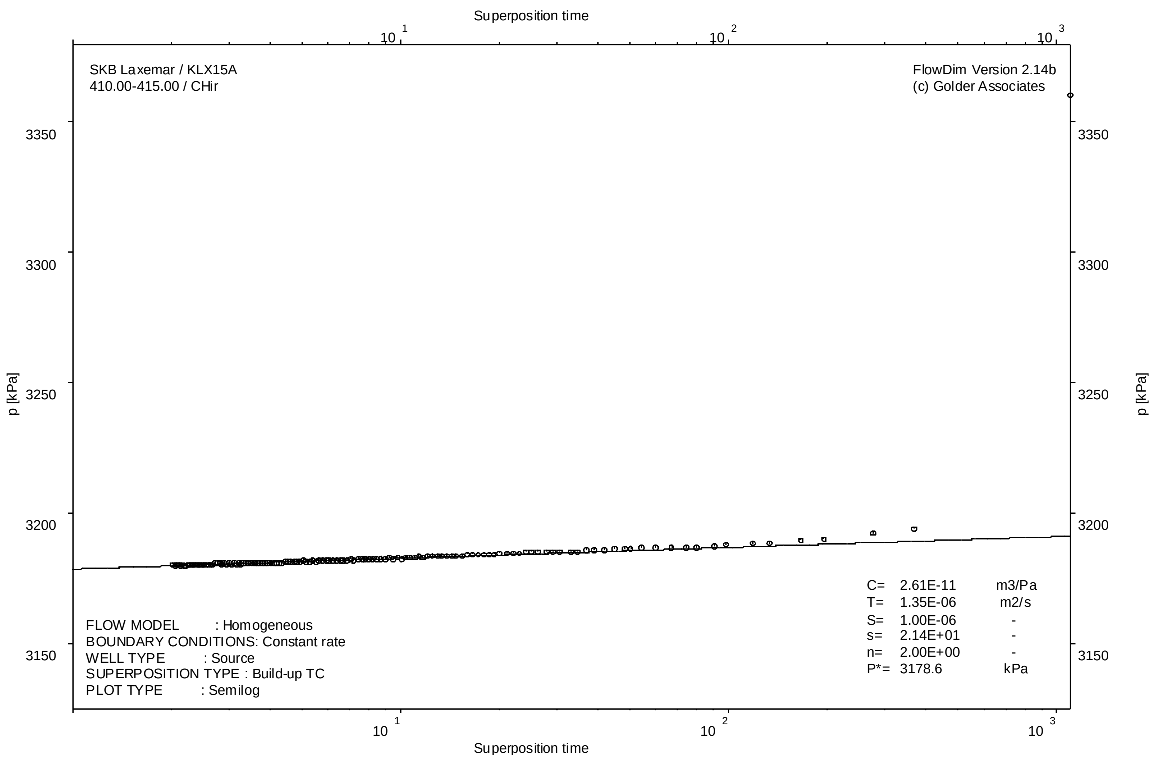
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

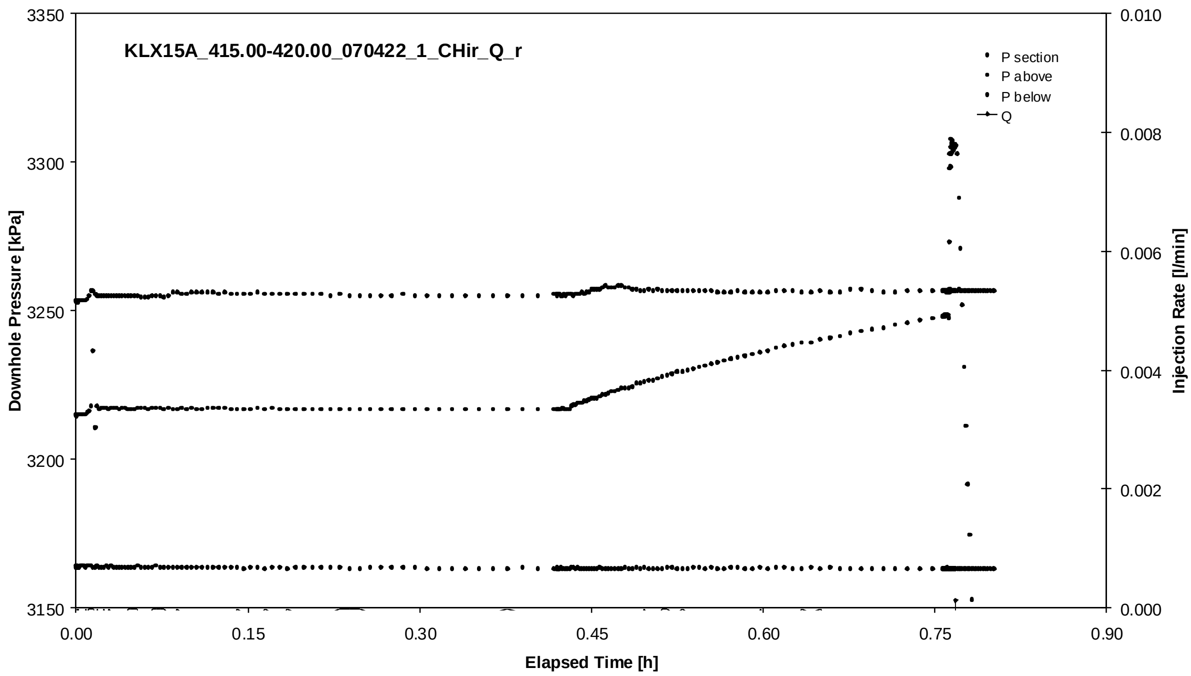


CHIR phase; HORNER match

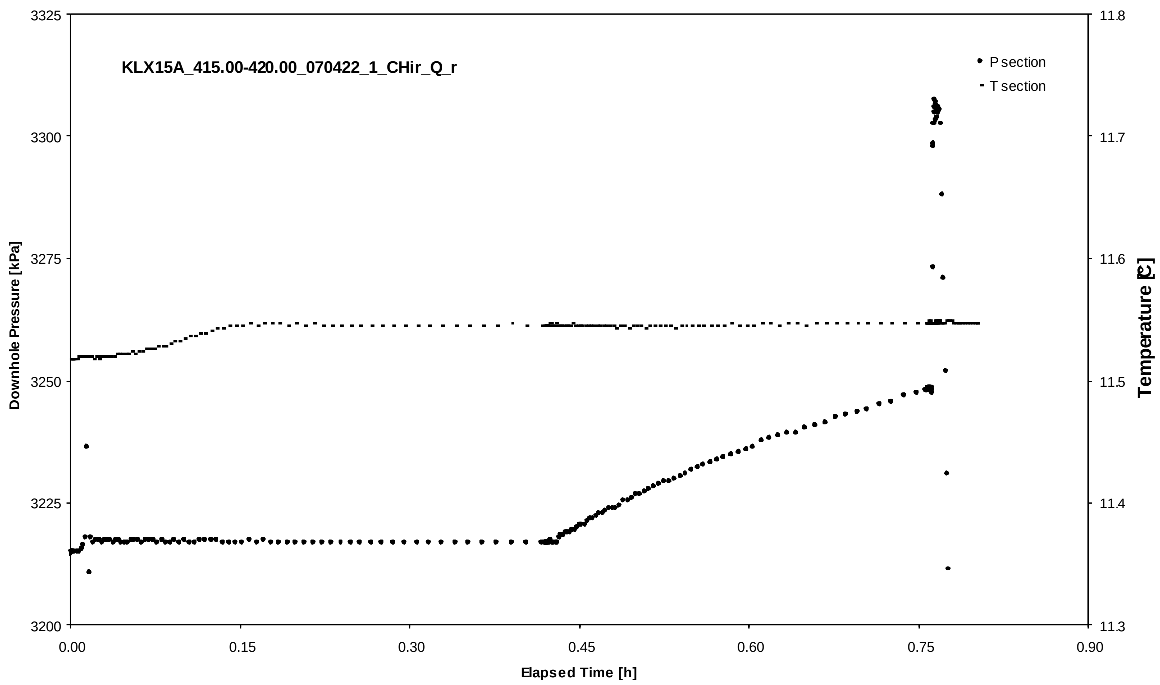
APPENDIX 2-61

Test 415.00 – 420.00 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

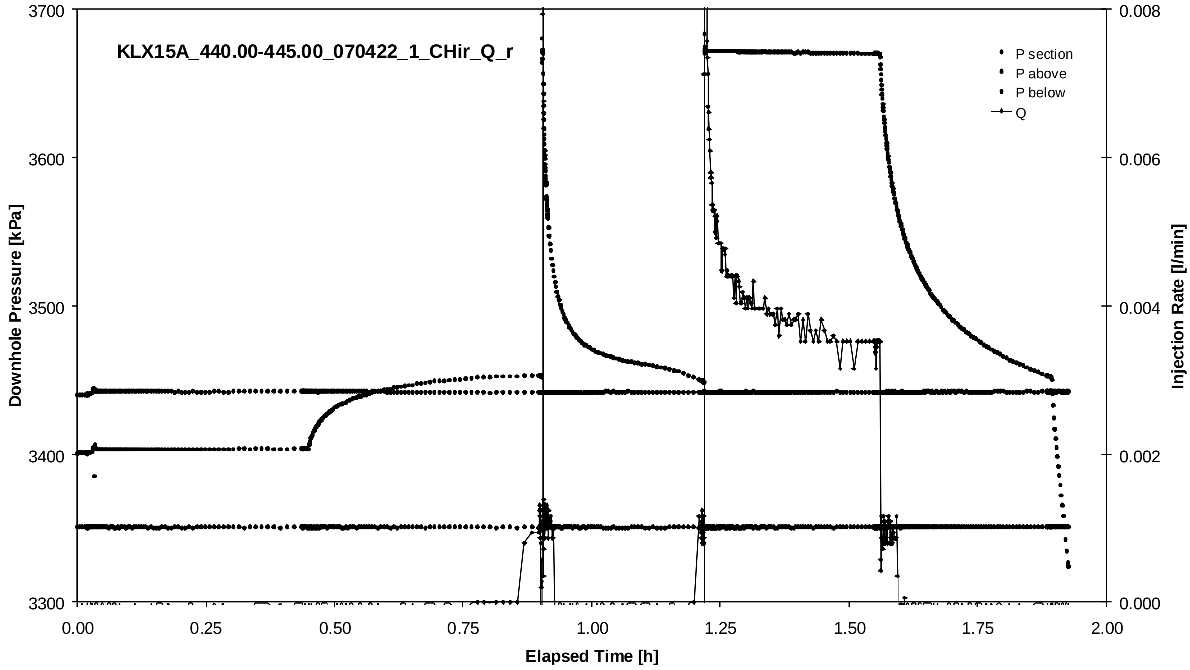
Not analysed

CHIR phase; HORNER match

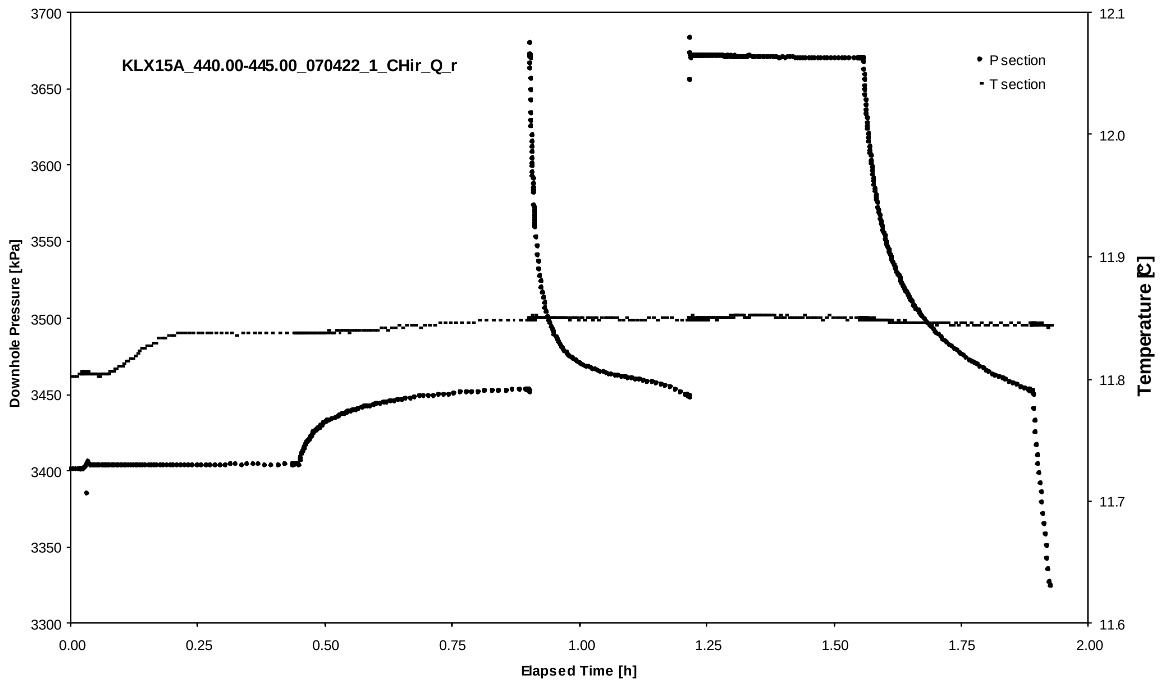
APPENDIX 2-62

Test 440.00 – 445.00 m

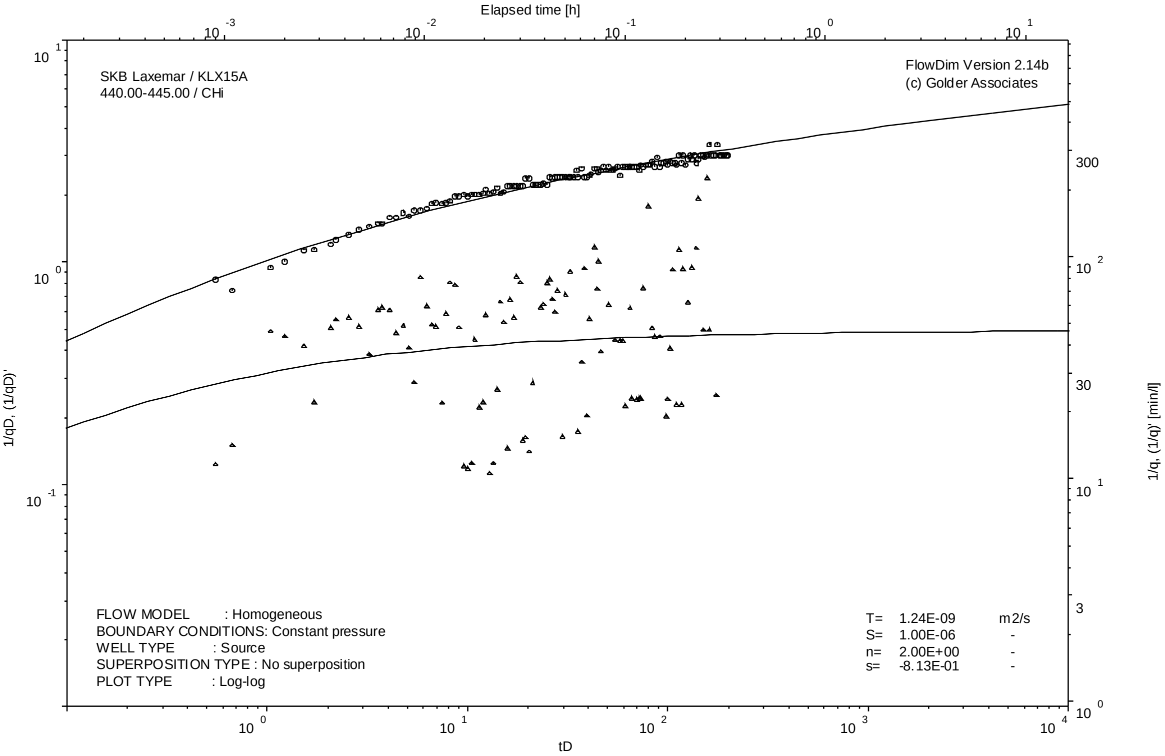
Analysis diagrams



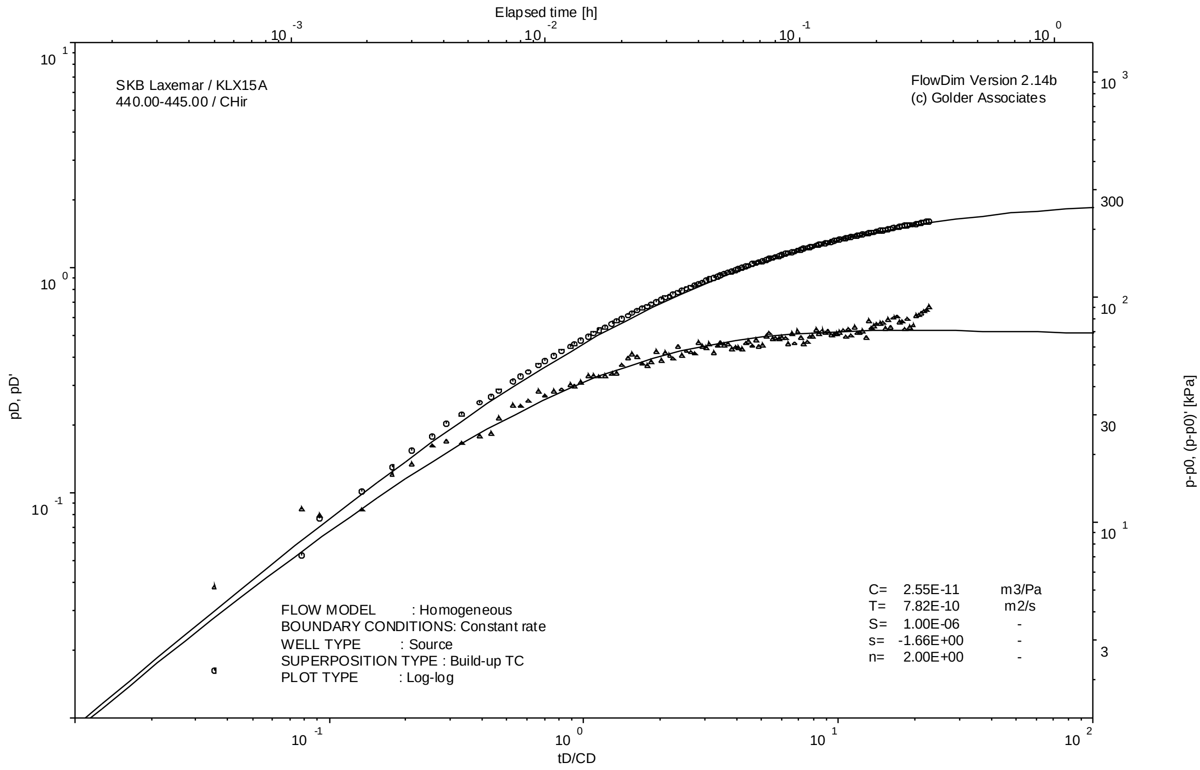
Pressure and flow rate vs. time; cartesian plot



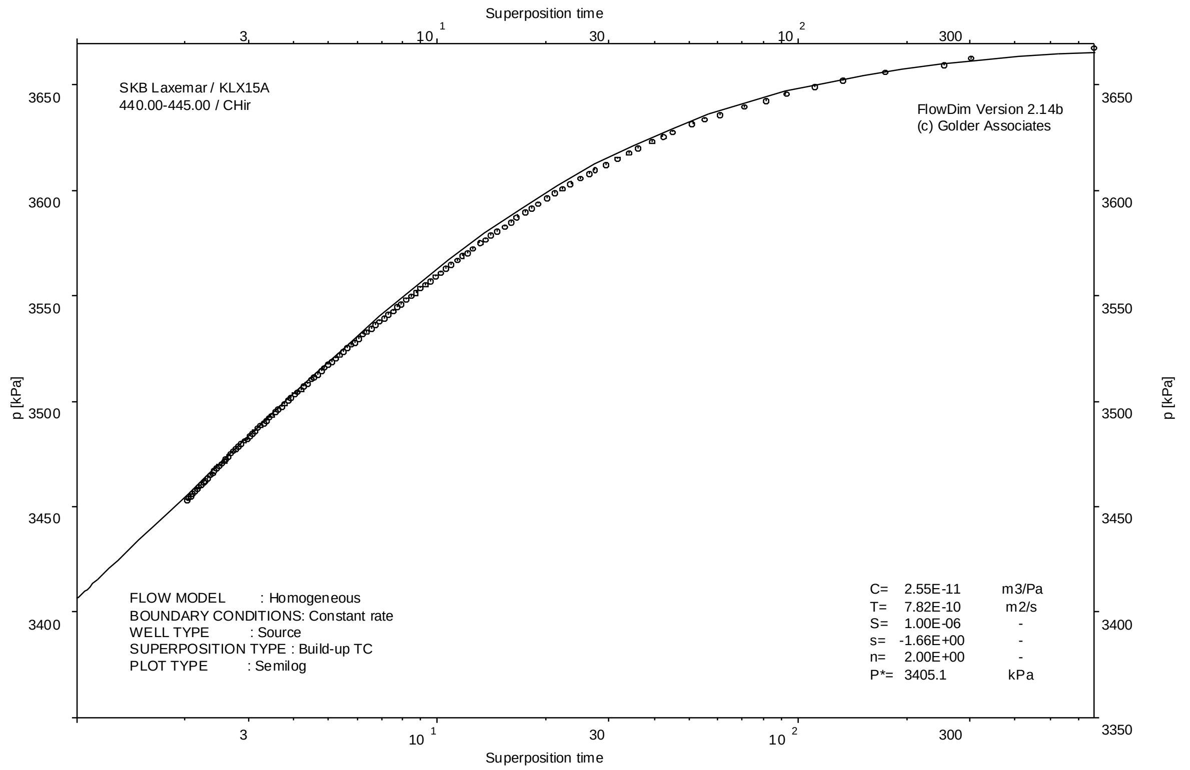
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

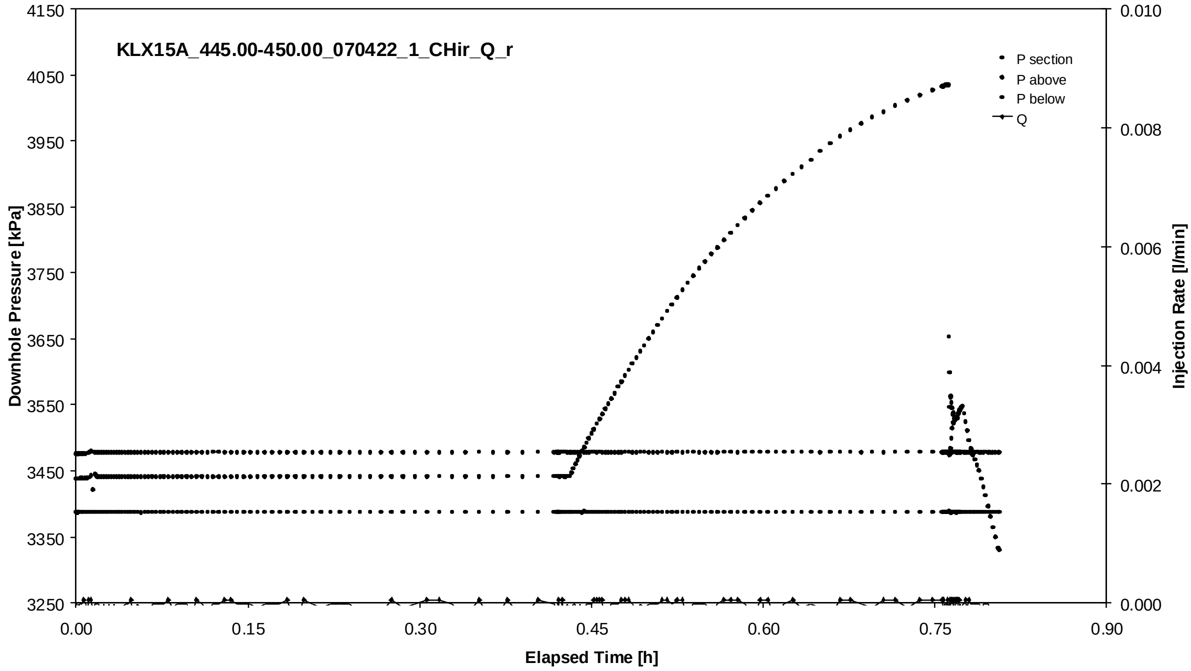


CHIR phase; HORNER match

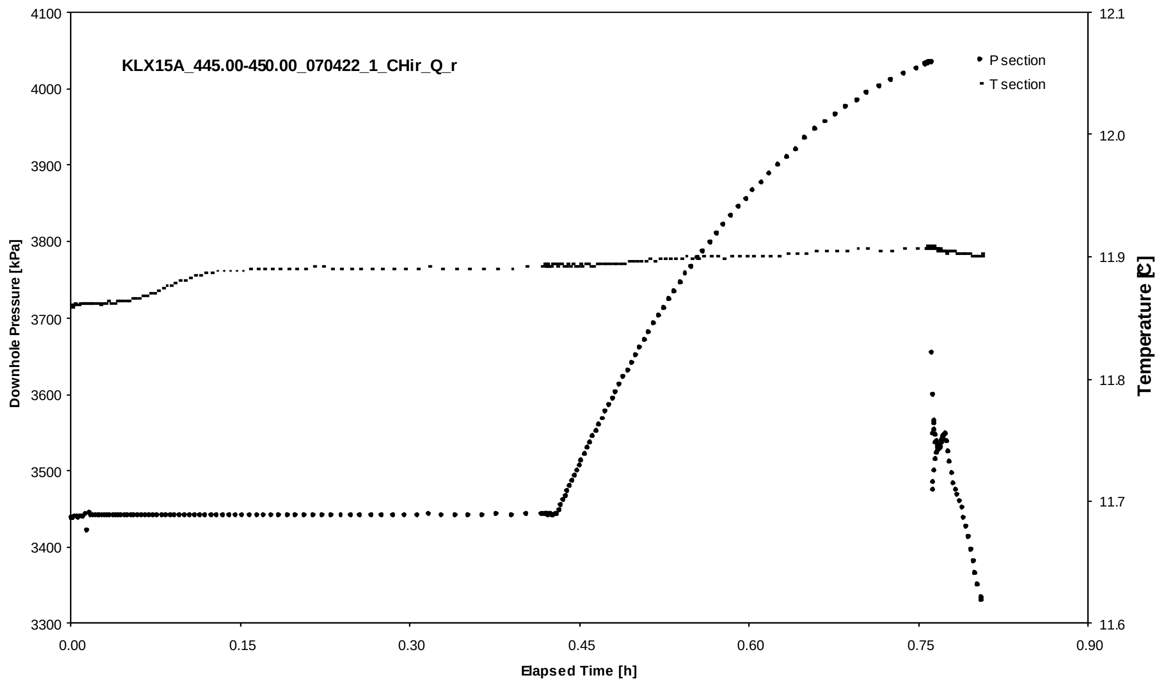
APPENDIX 2-63

Test 445.00 – 450.00 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

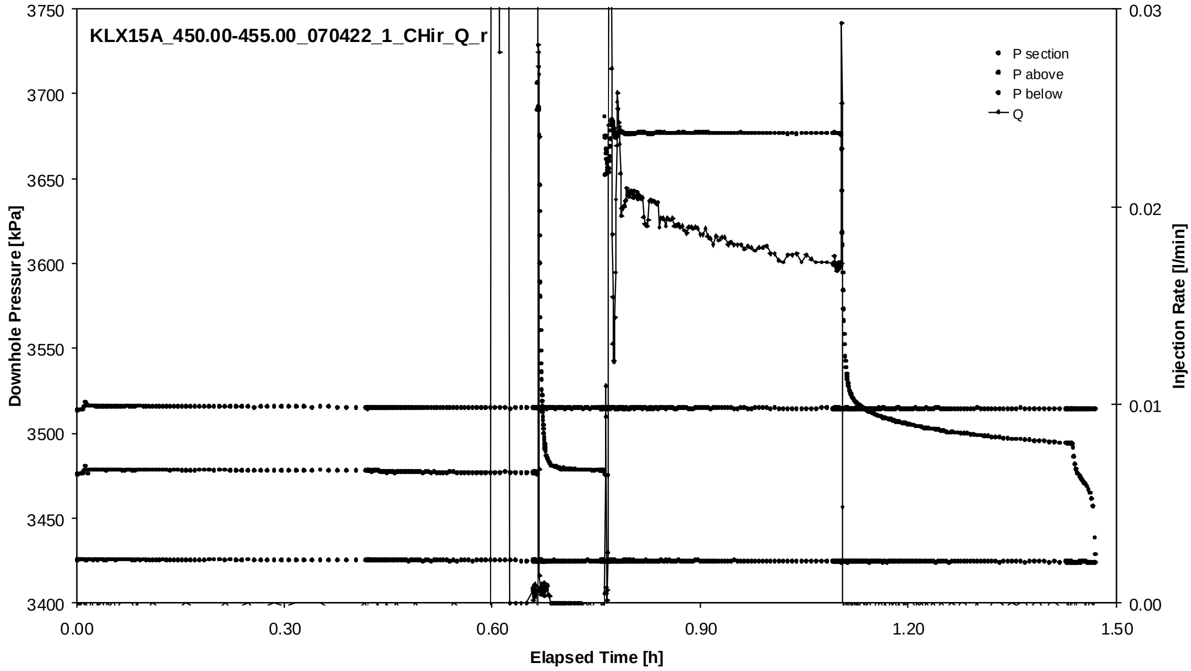
Not analysed

CHIR phase; HORNER match

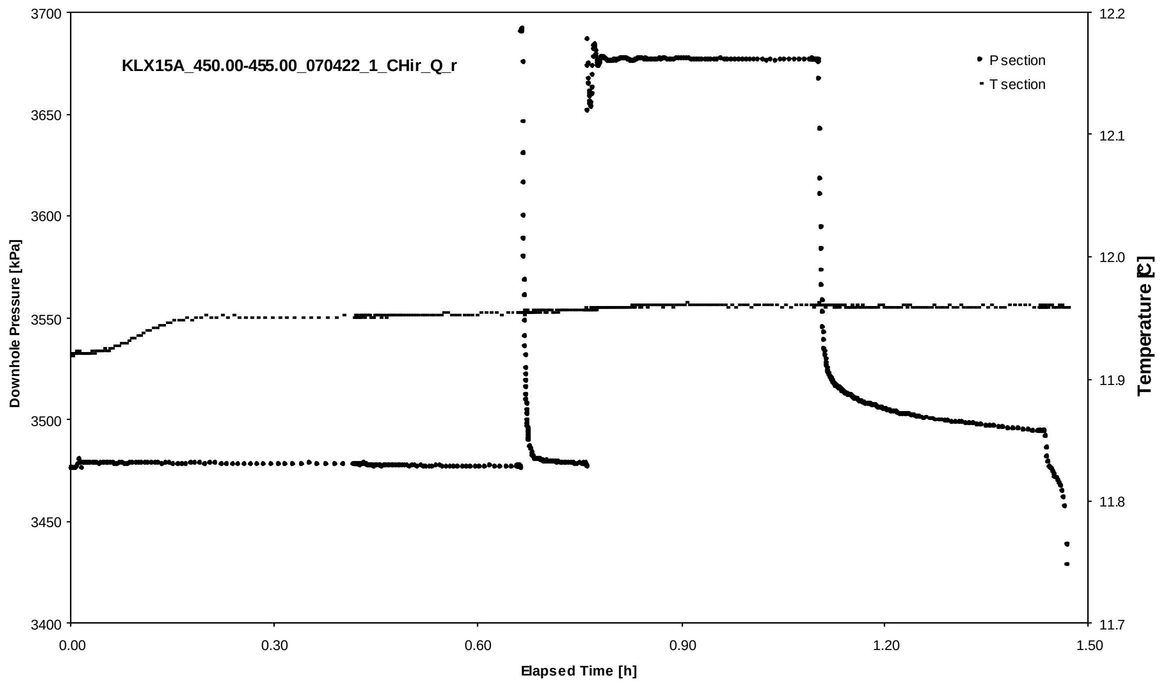
APPENDIX 2-64

Test 450.00 – 455.00 m

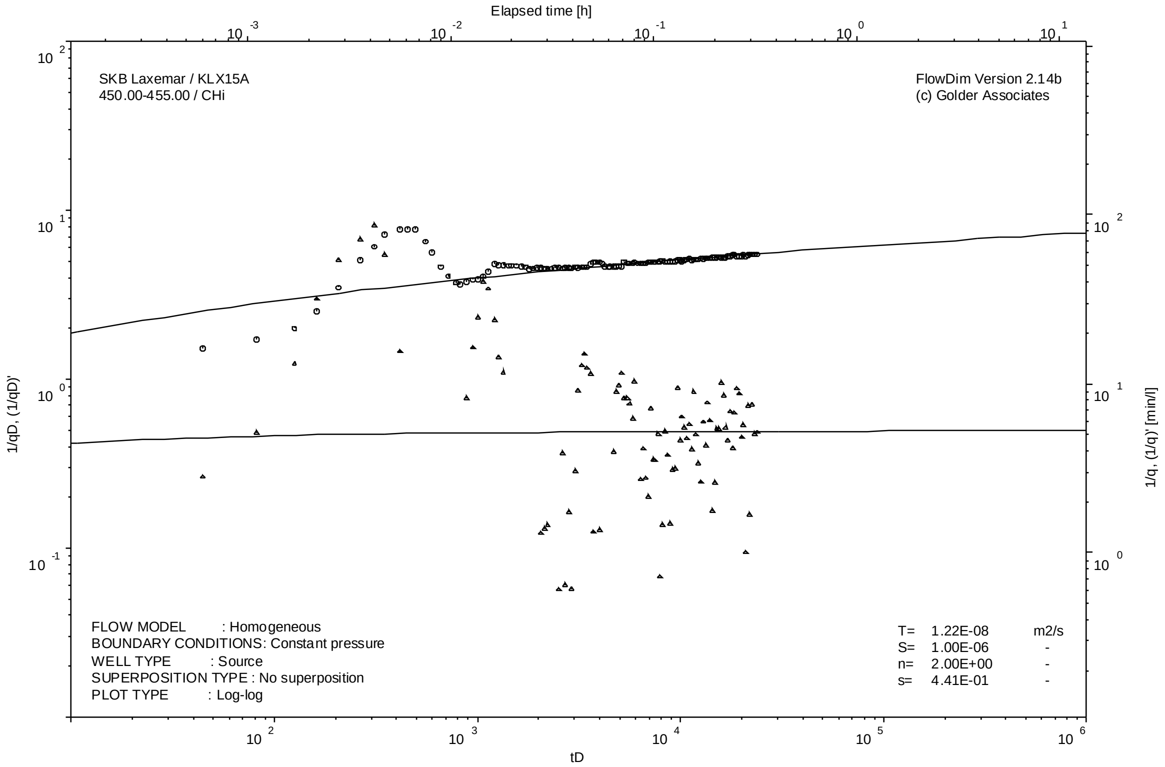
Analysis diagrams



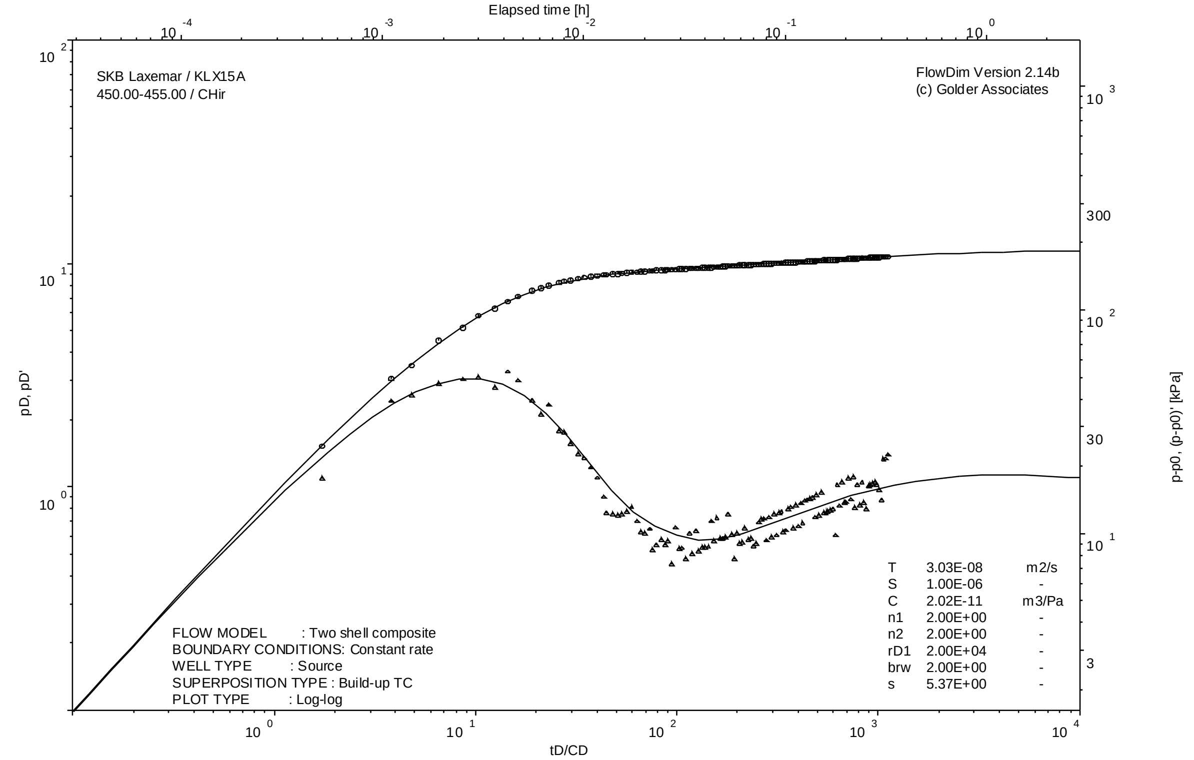
Pressure and flow rate vs. time; cartesian plot



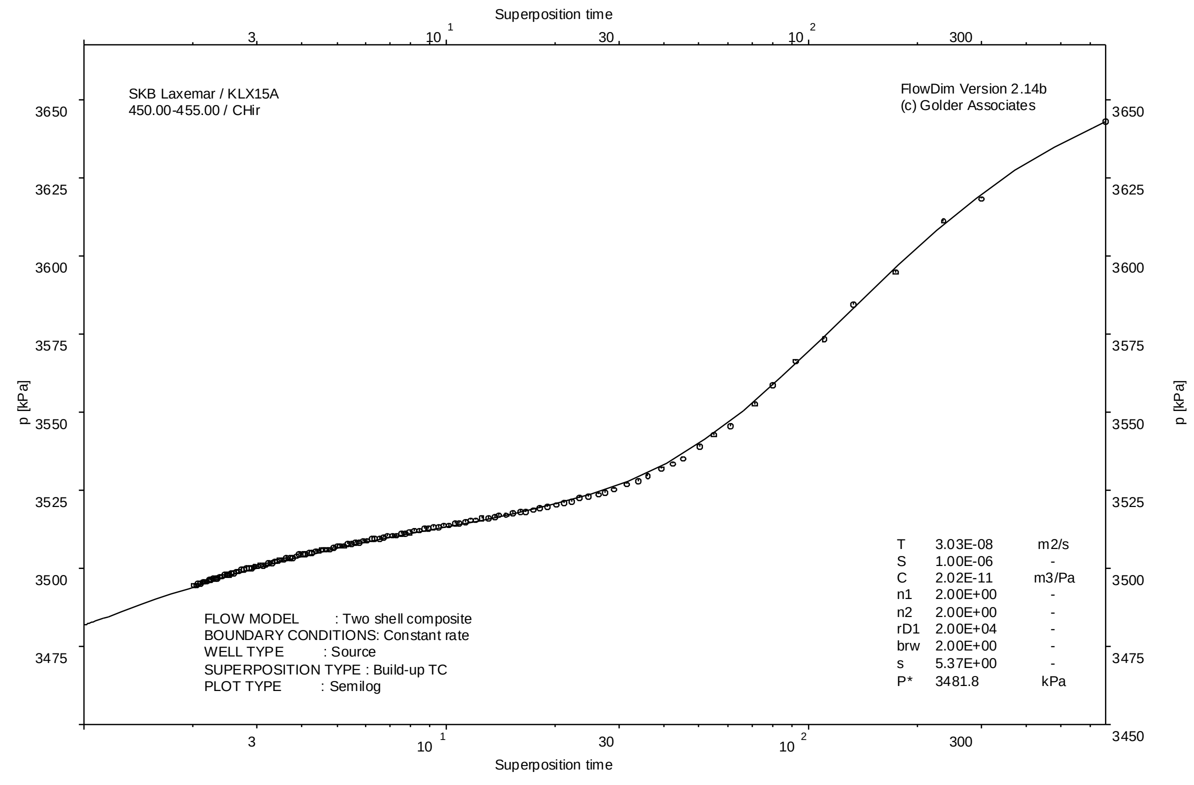
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

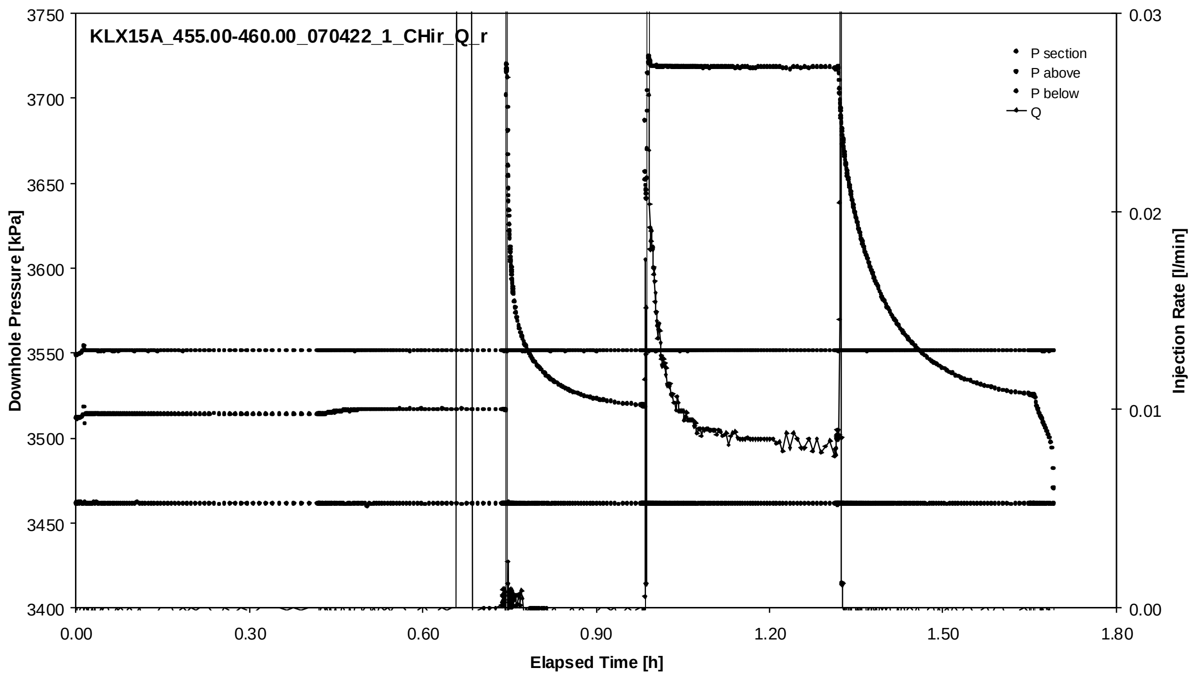


CHIR phase; HORNER match

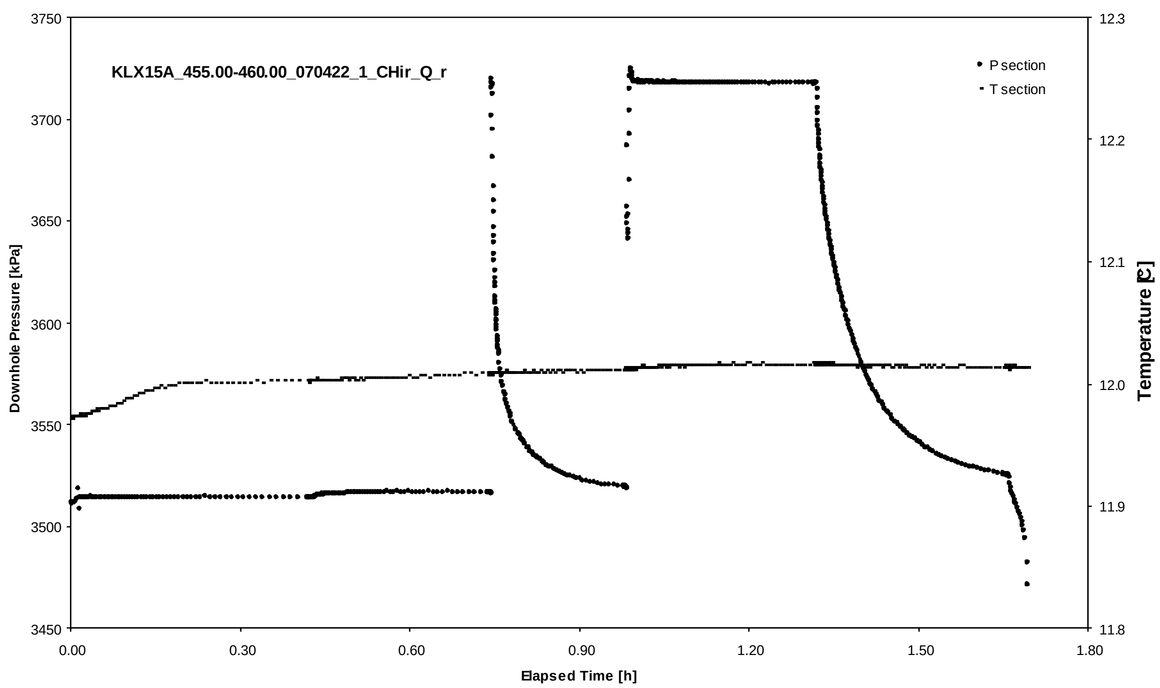
APPENDIX 2-65

Test 455.00 – 460.00 m

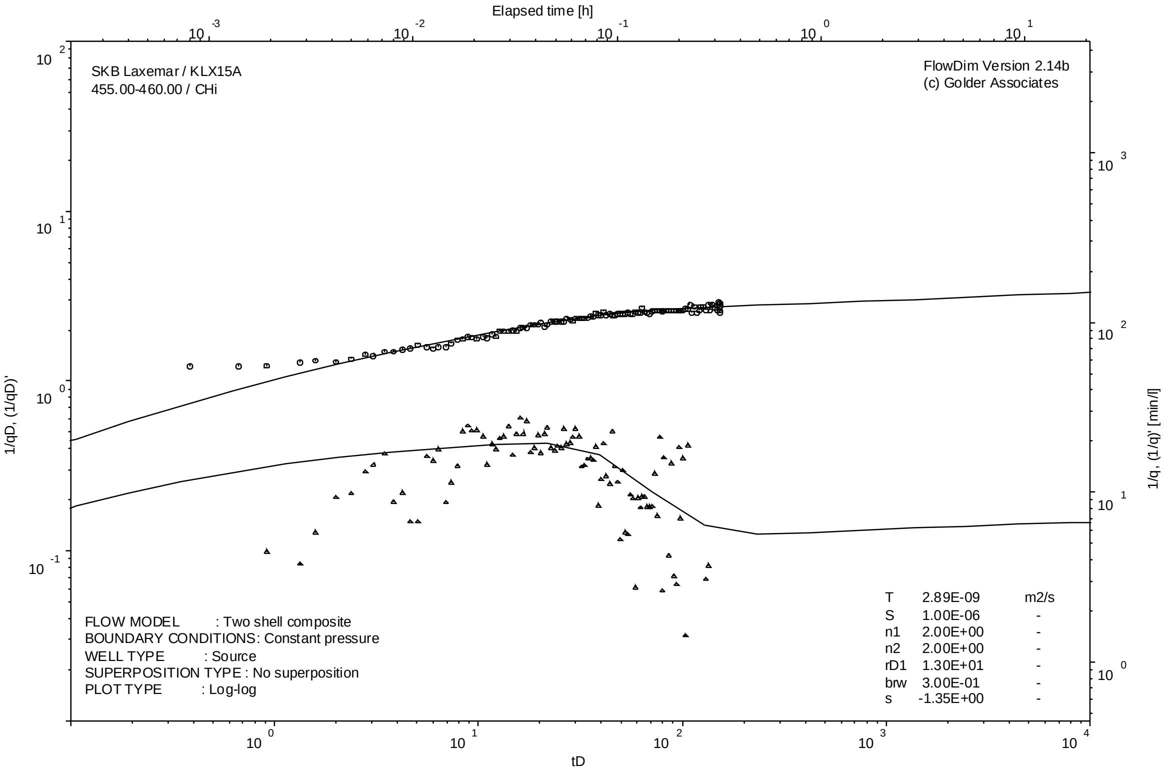
Analysis diagrams



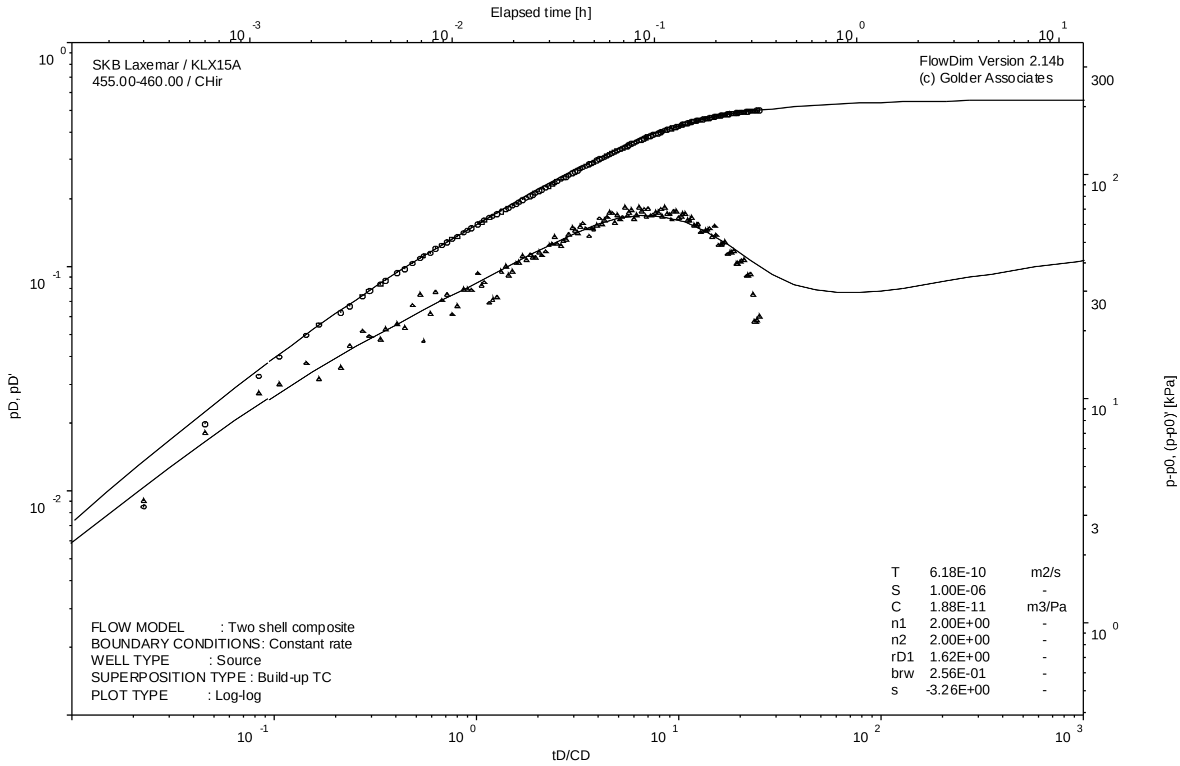
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

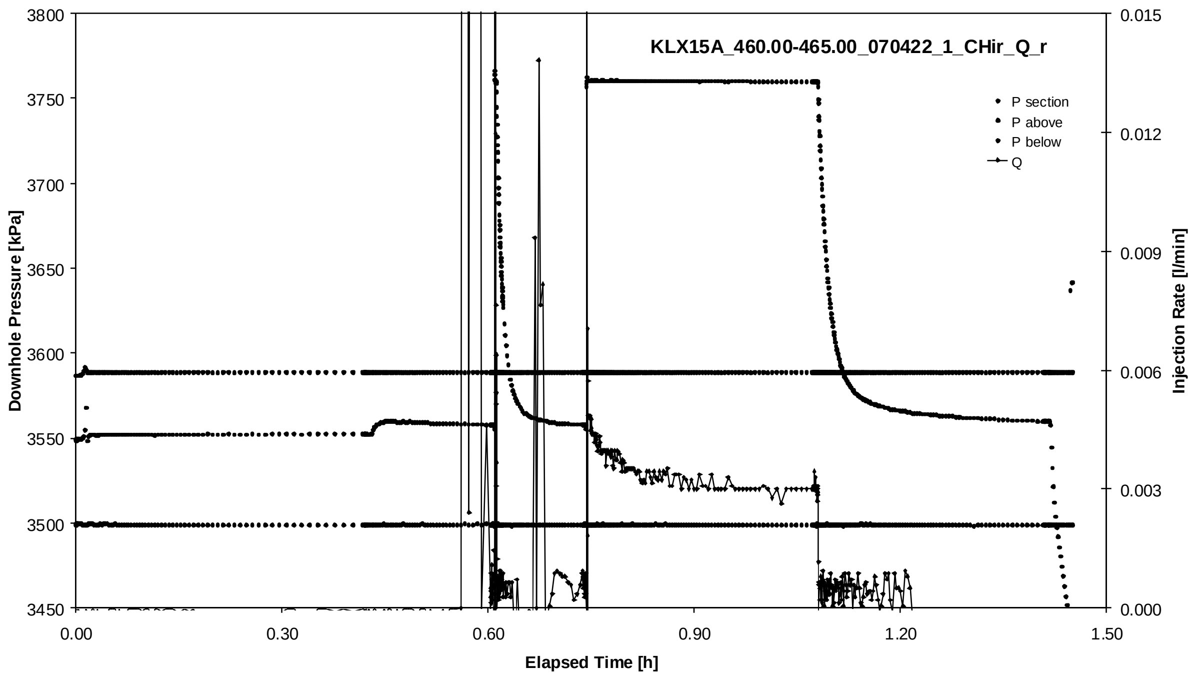
Not analysable

CHIR phase; HORNER match

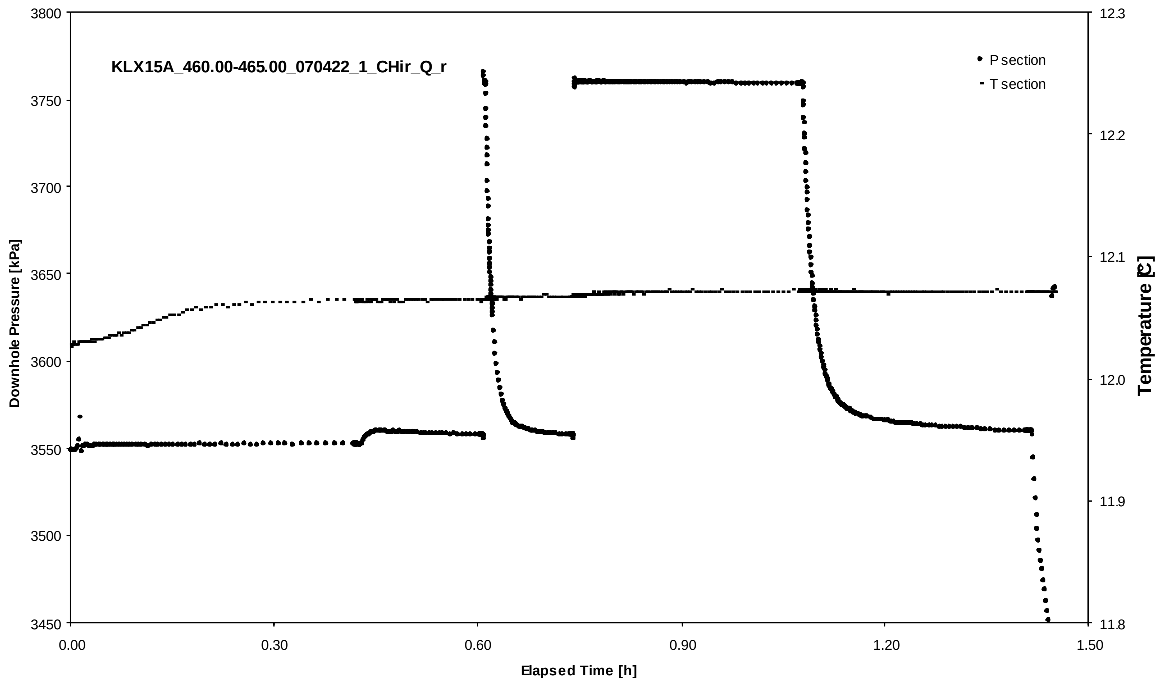
APPENDIX 2-66

Test 460.00 – 465.00 m

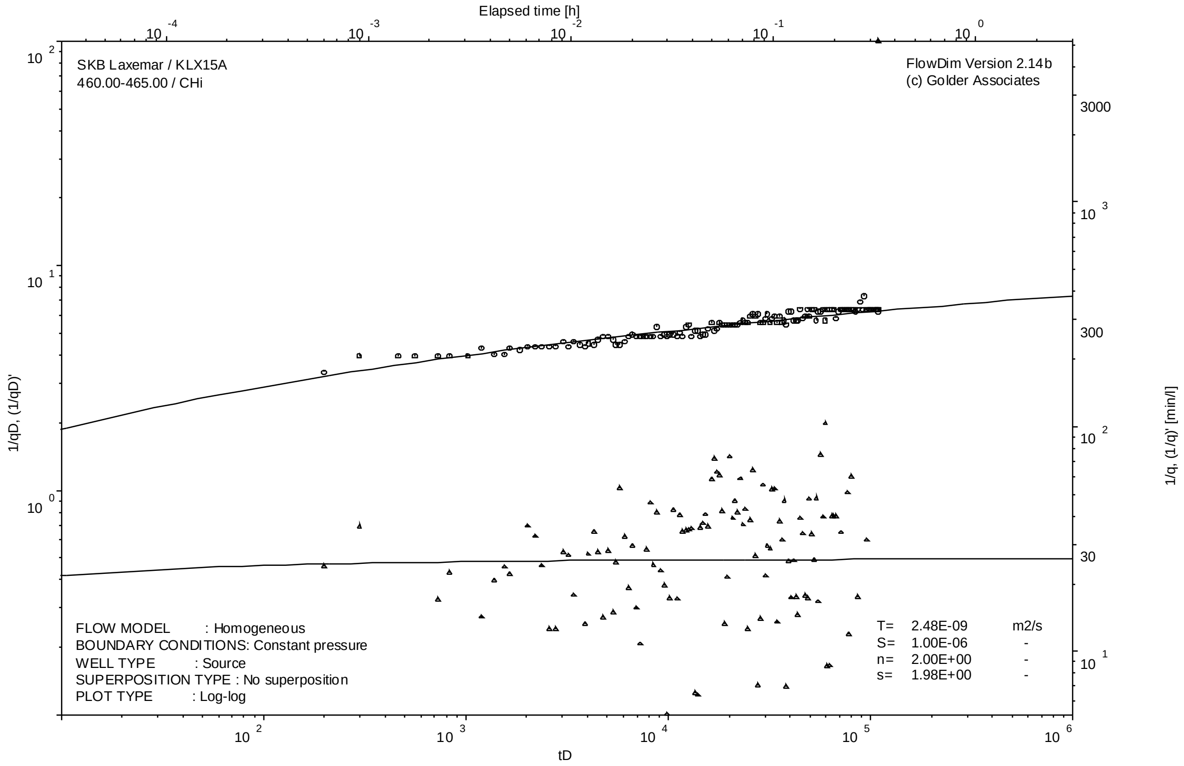
Analysis diagrams



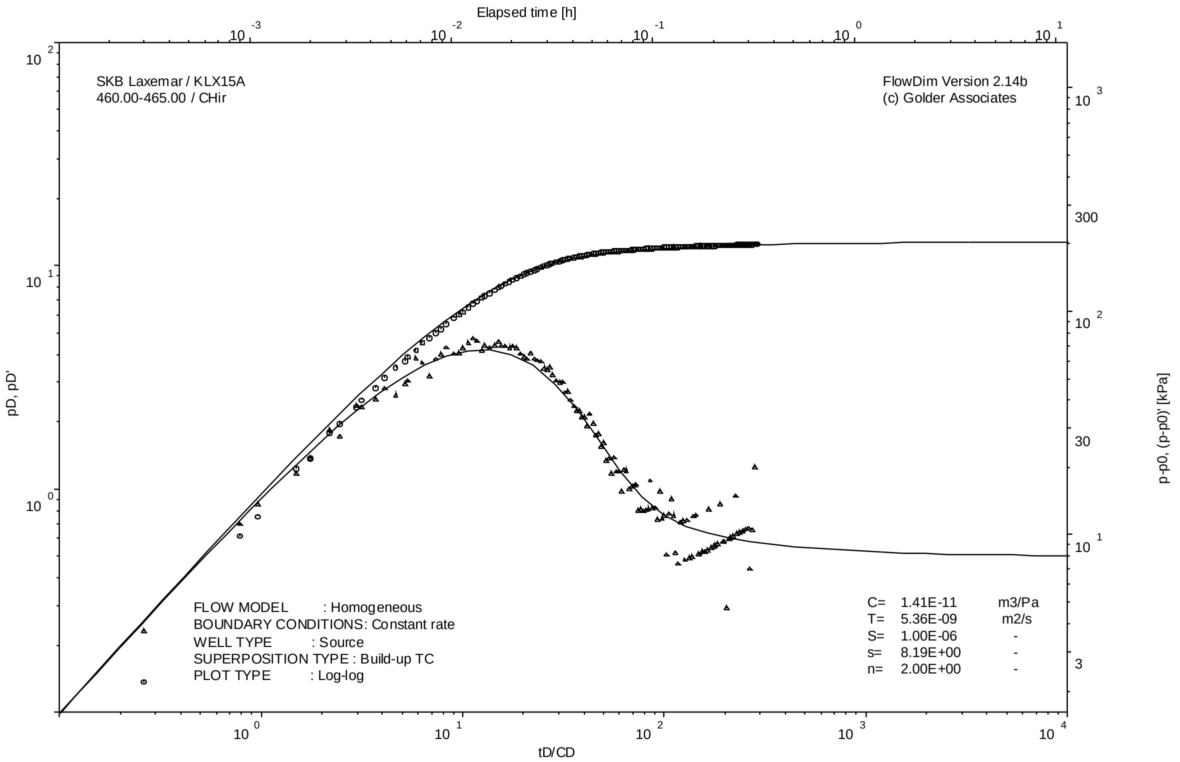
Pressure and flow rate vs. time; cartesian plot



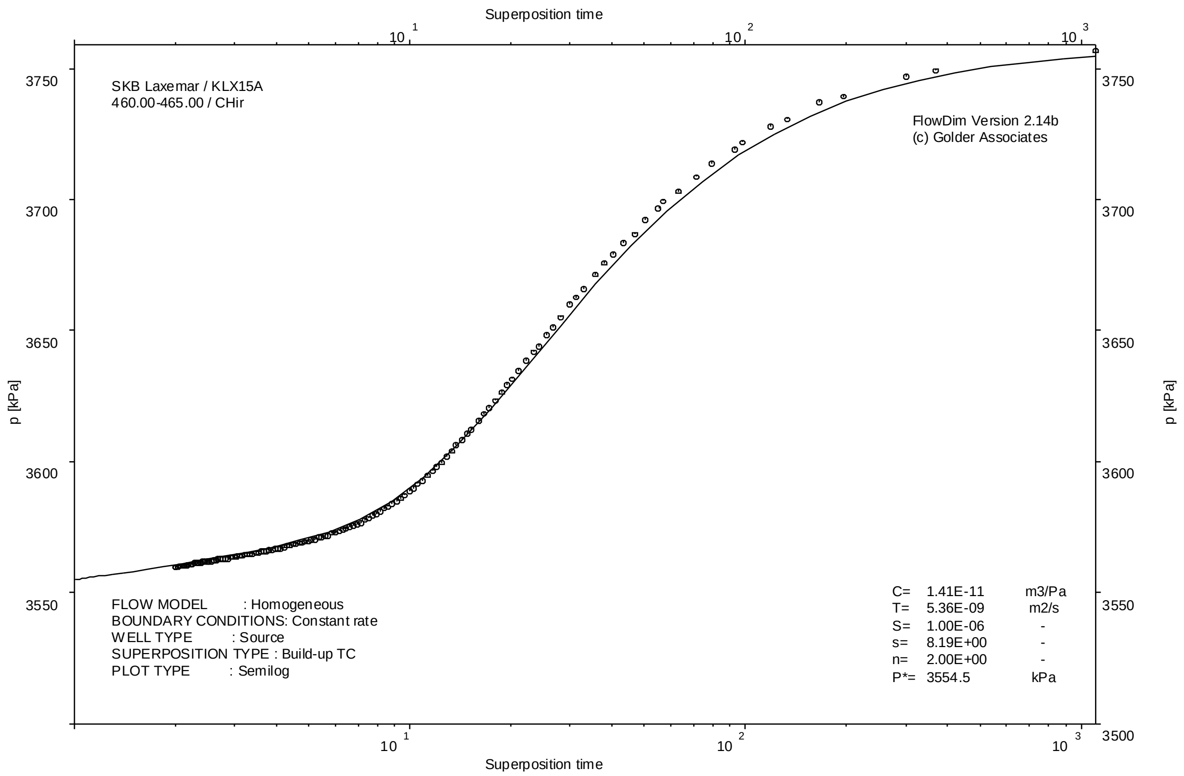
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

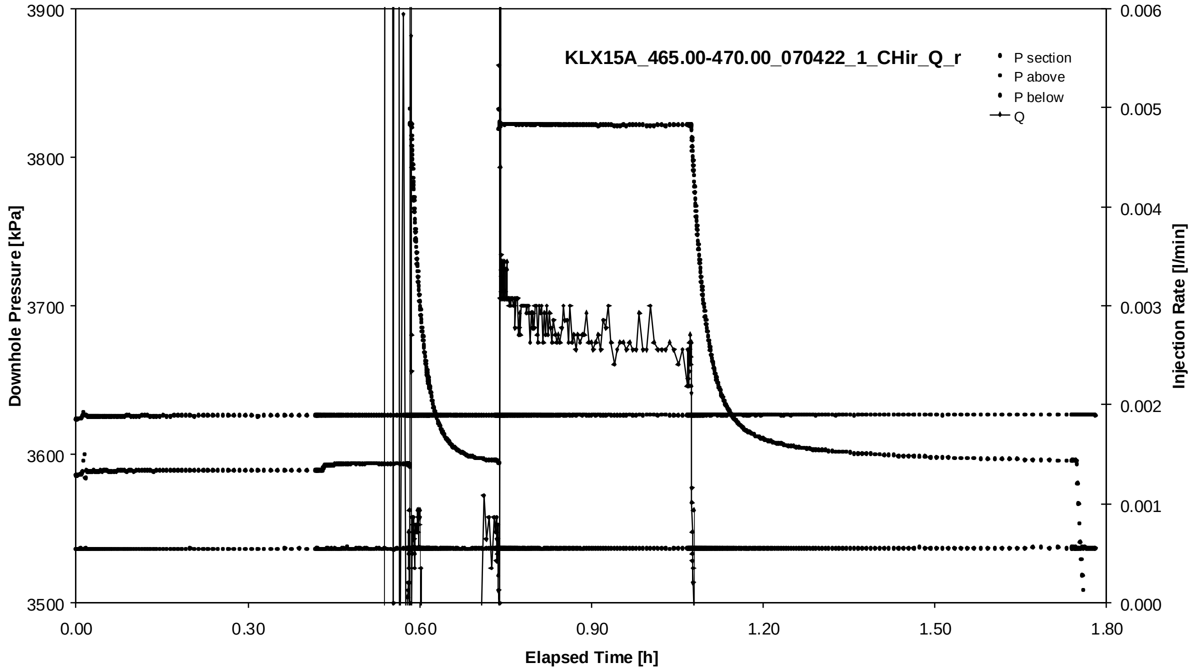


CHIR phase; HORNER match

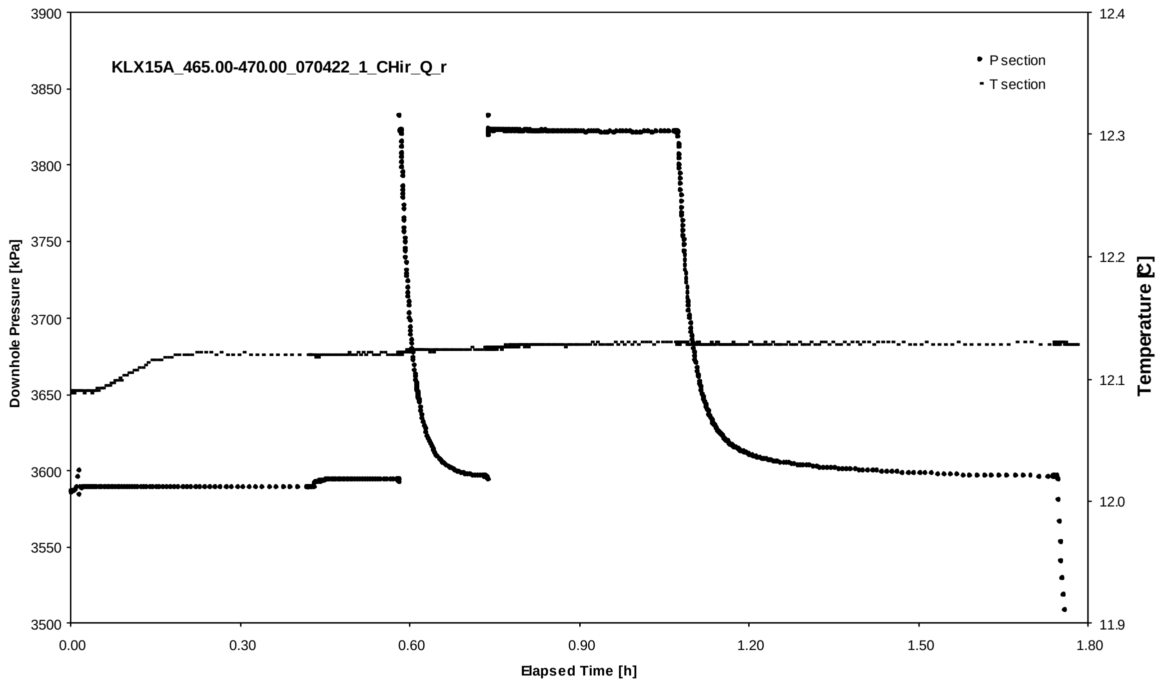
APPENDIX 2-67

Test 465.00 – 470.00 m

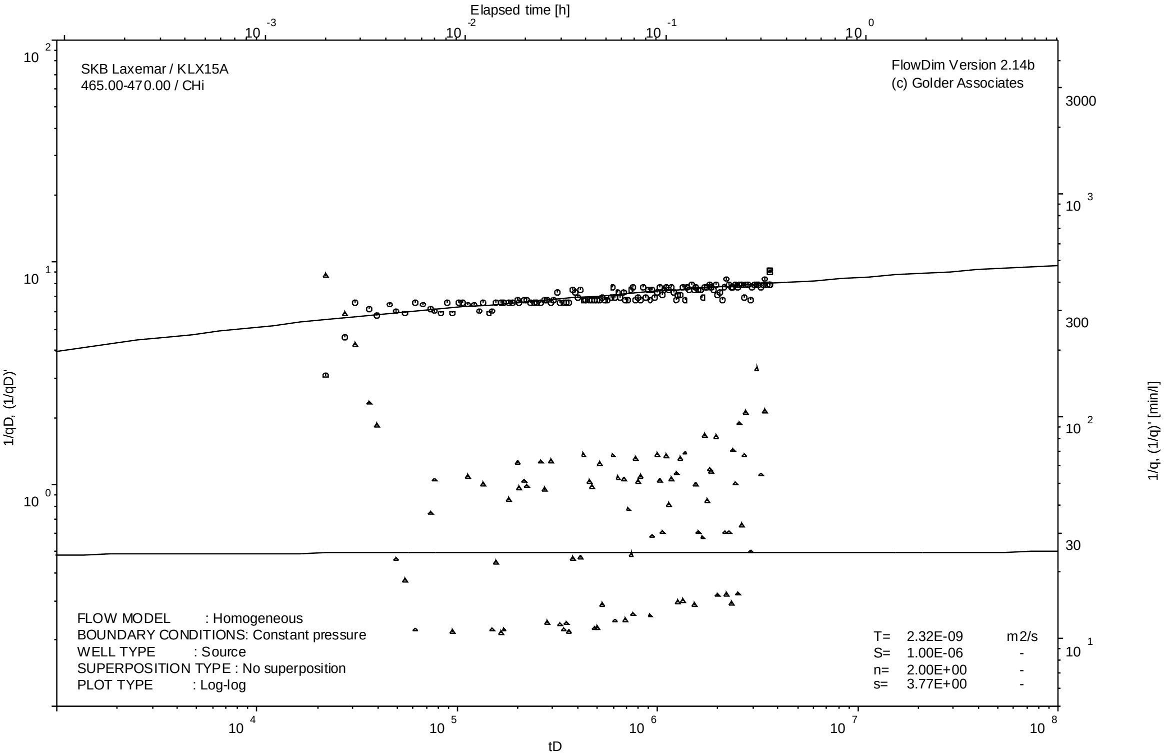
Analysis diagrams



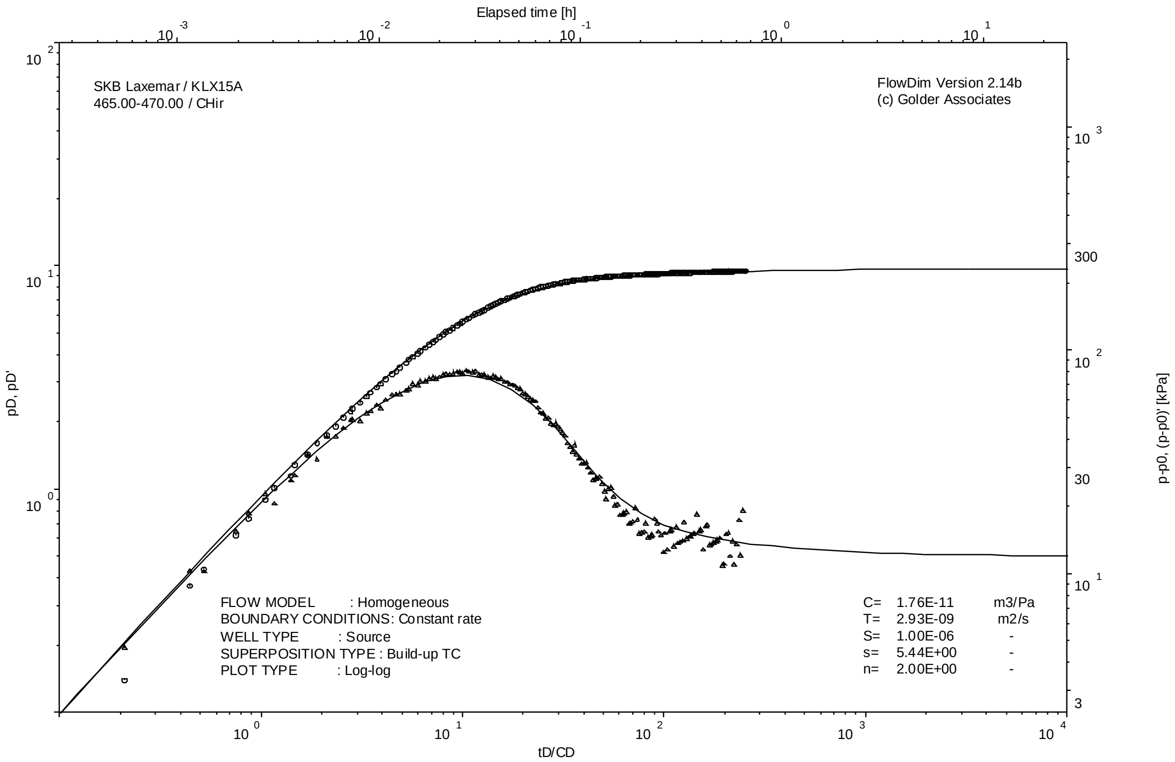
Pressure and flow rate vs. time; cartesian plot



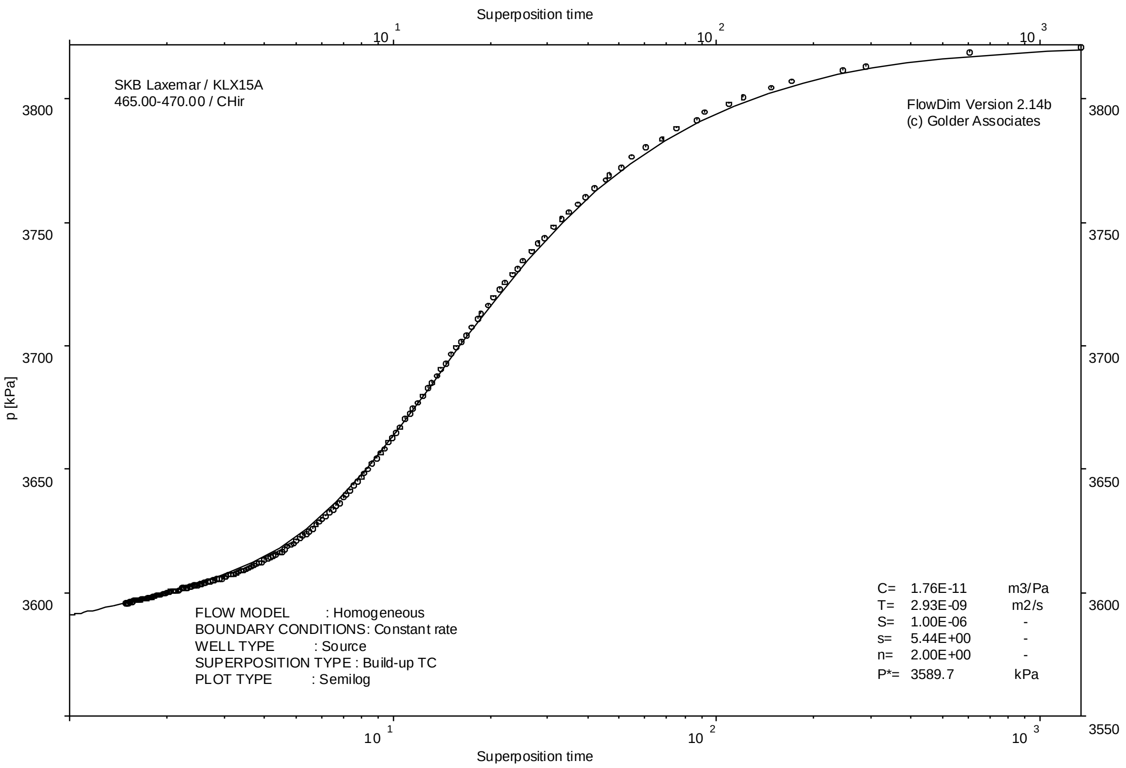
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

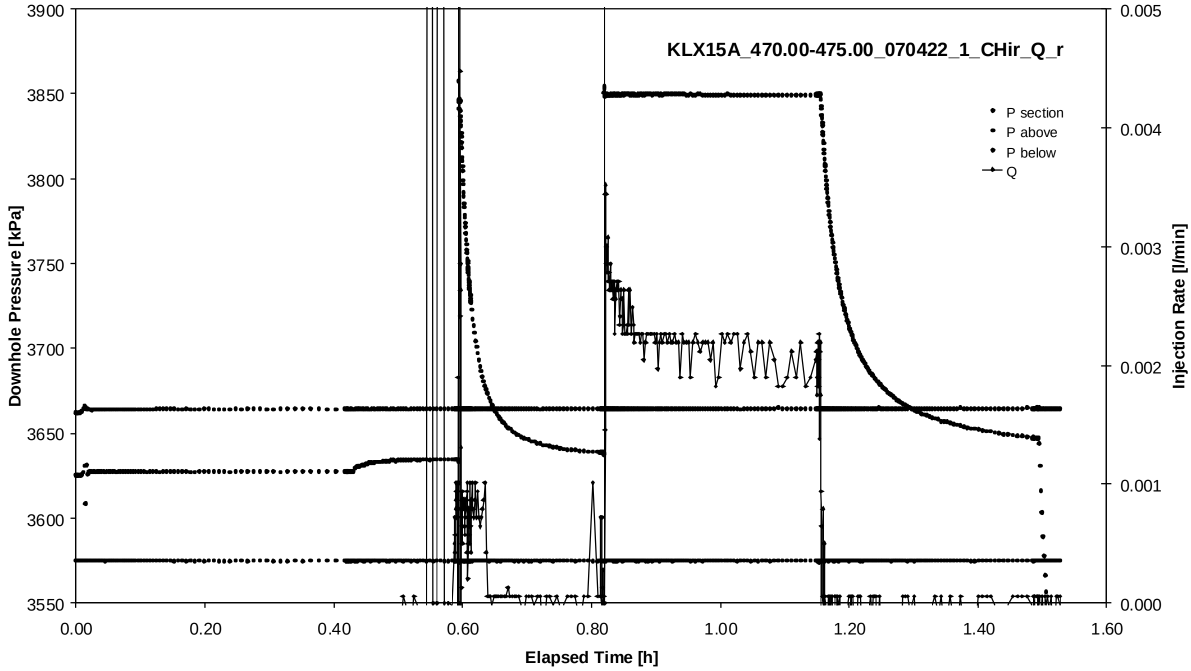


CHIR phase; HORNER match

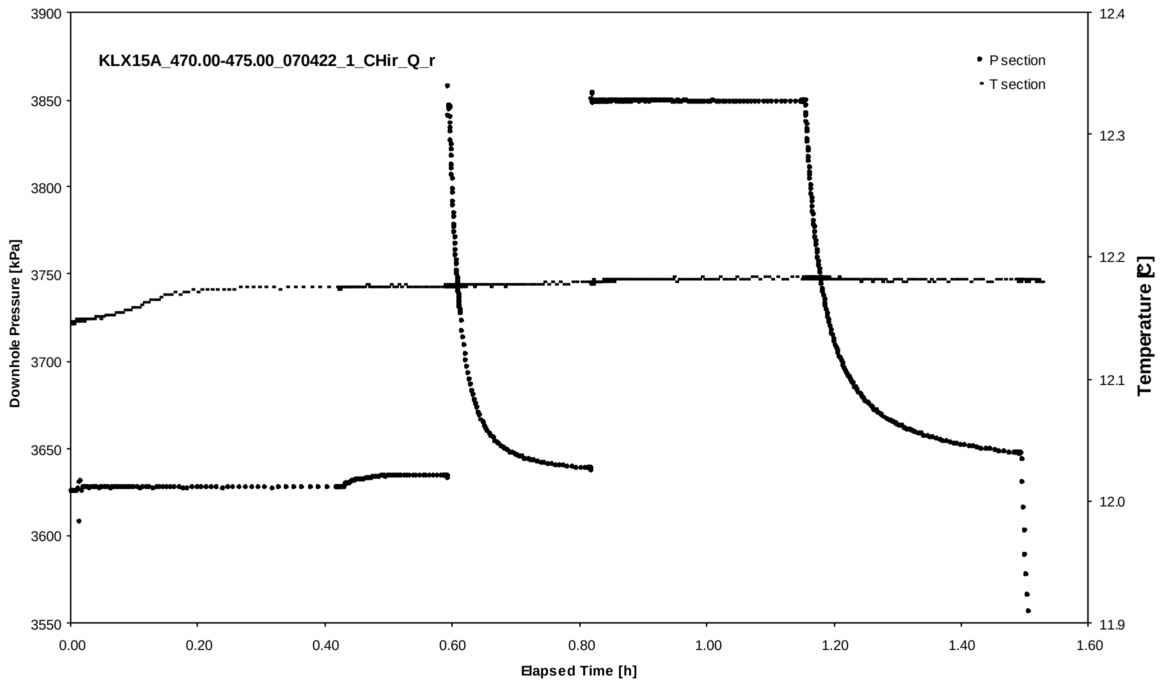
APPENDIX 2-68

Test 470.00 – 475.00 m

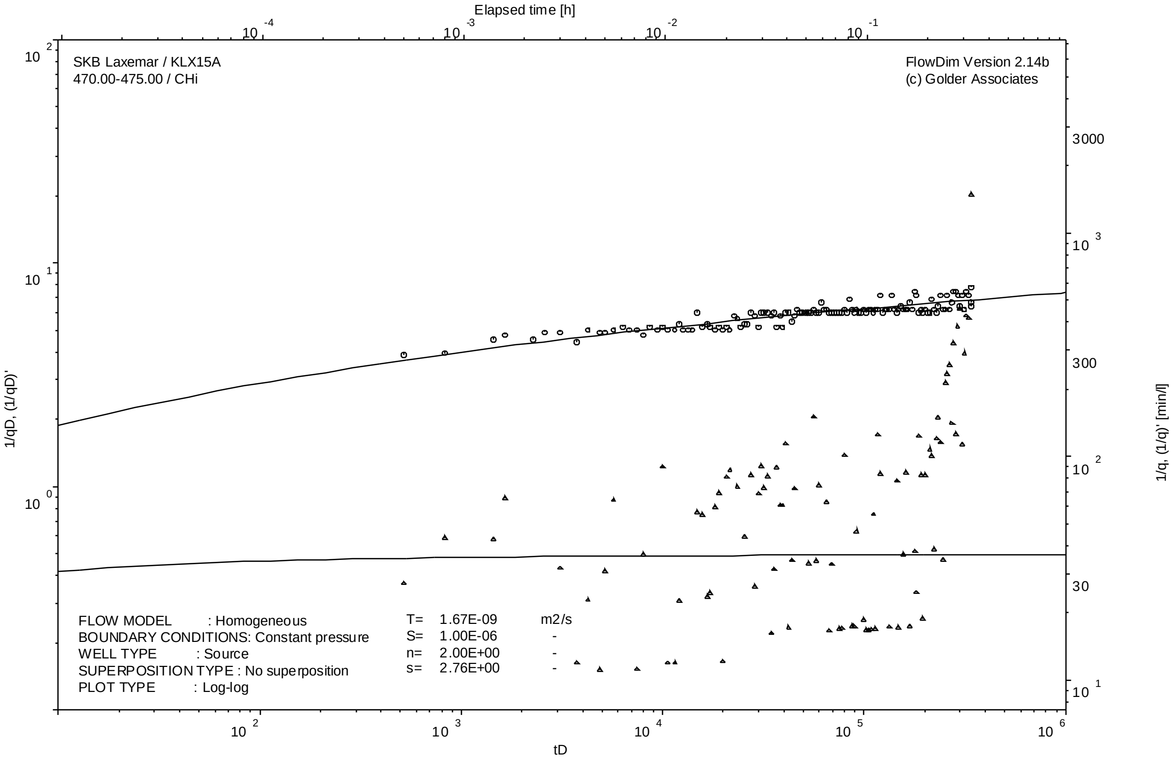
Analysis diagrams



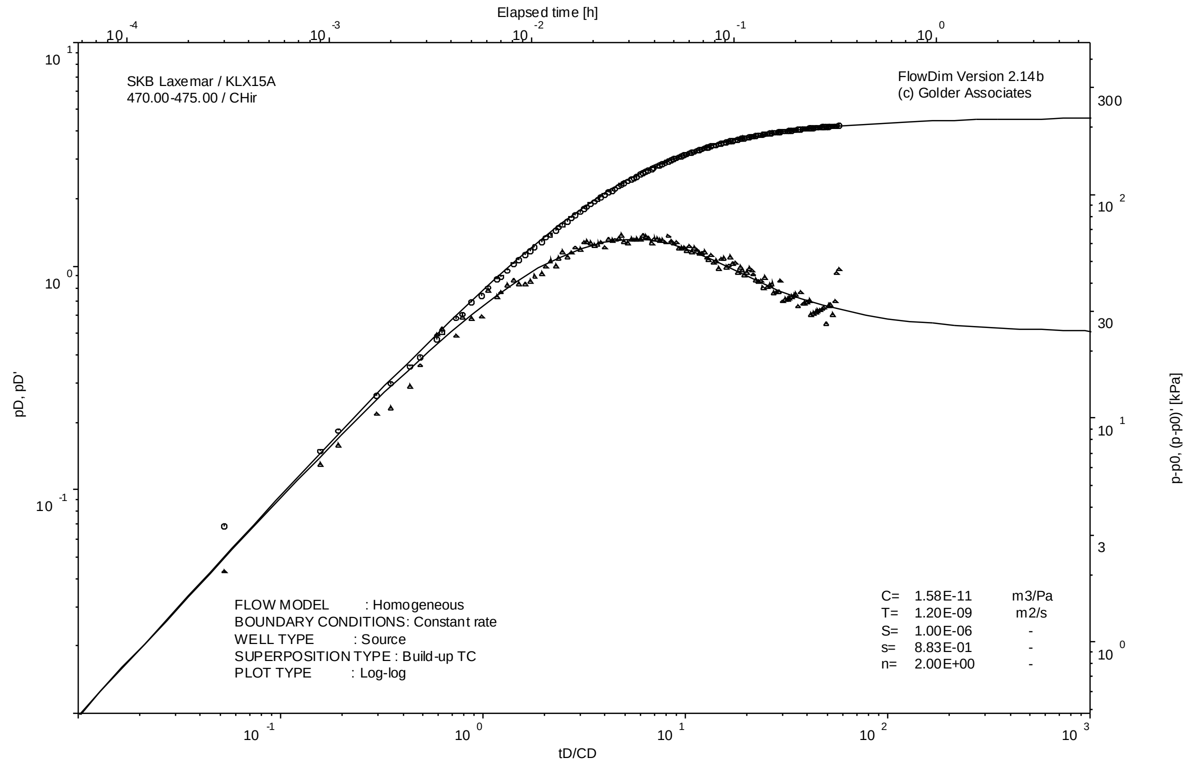
Pressure and flow rate vs. time; cartesian plot



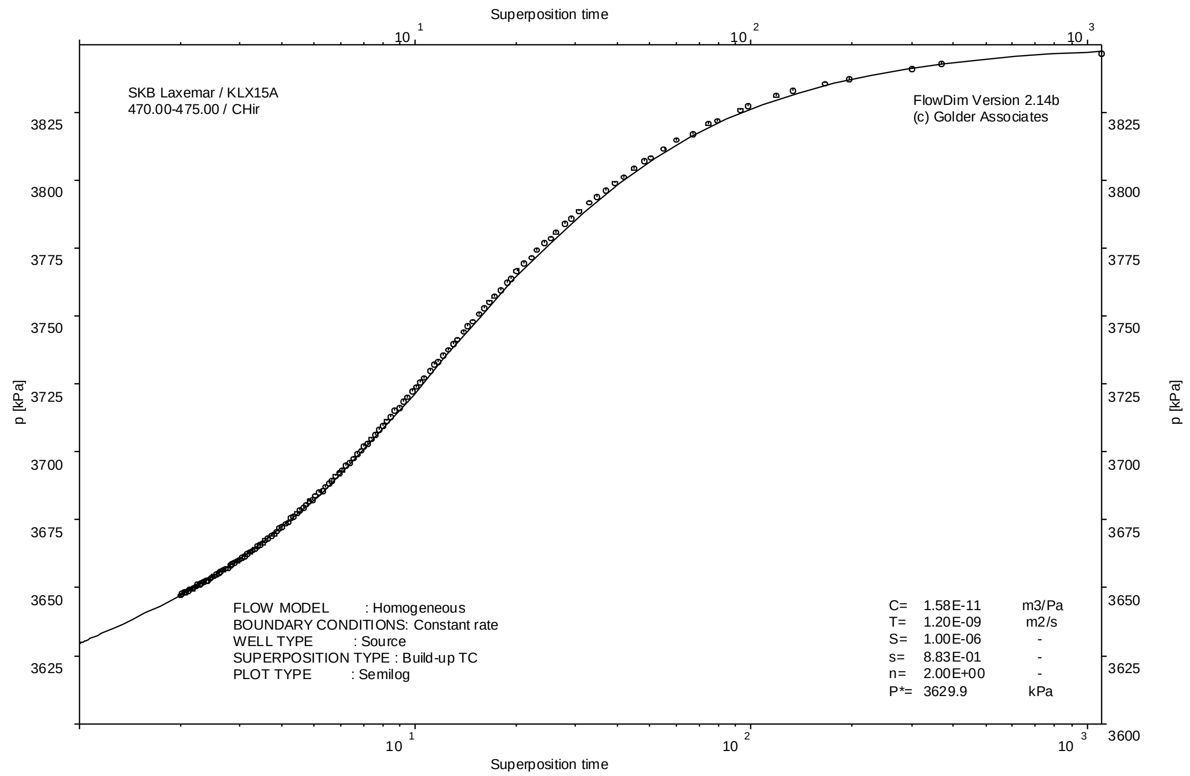
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

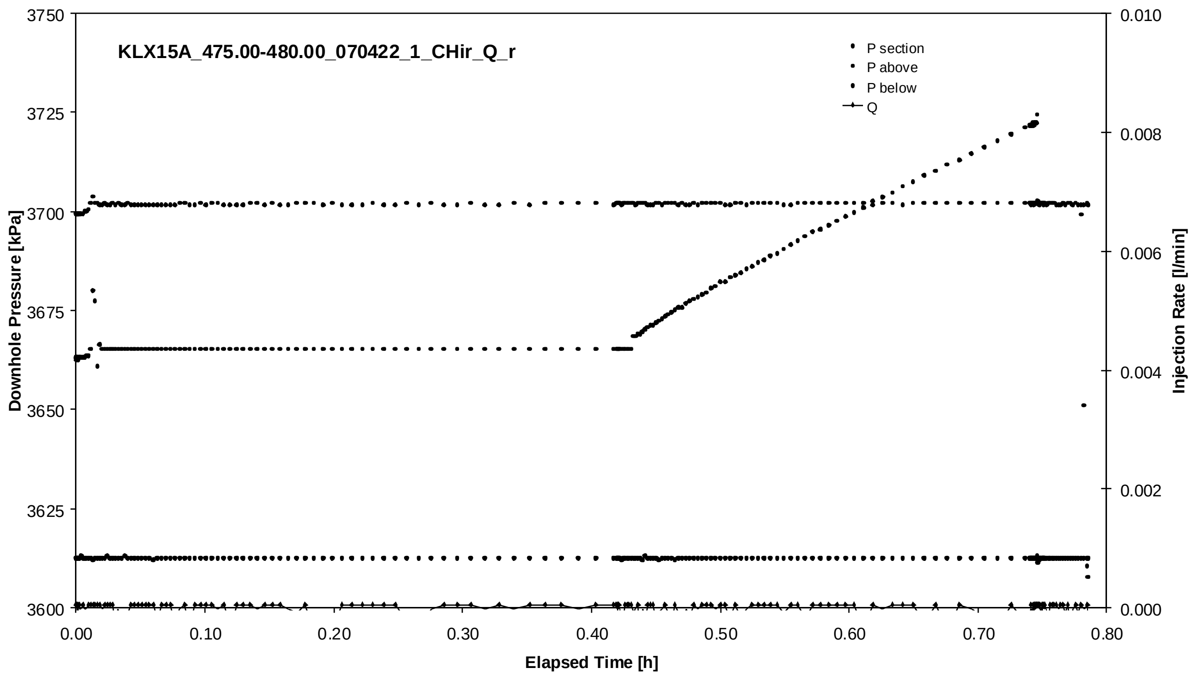


CHIR phase; HORNER match

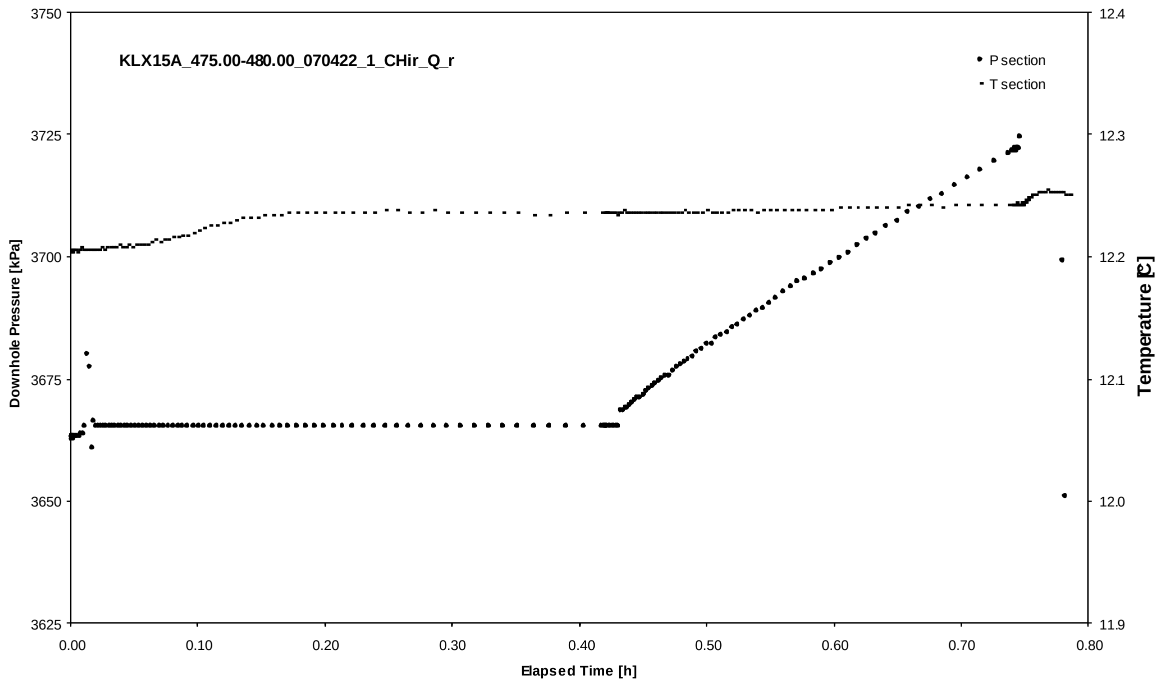
APPENDIX 2-69

Test 475.00 – 480.00 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

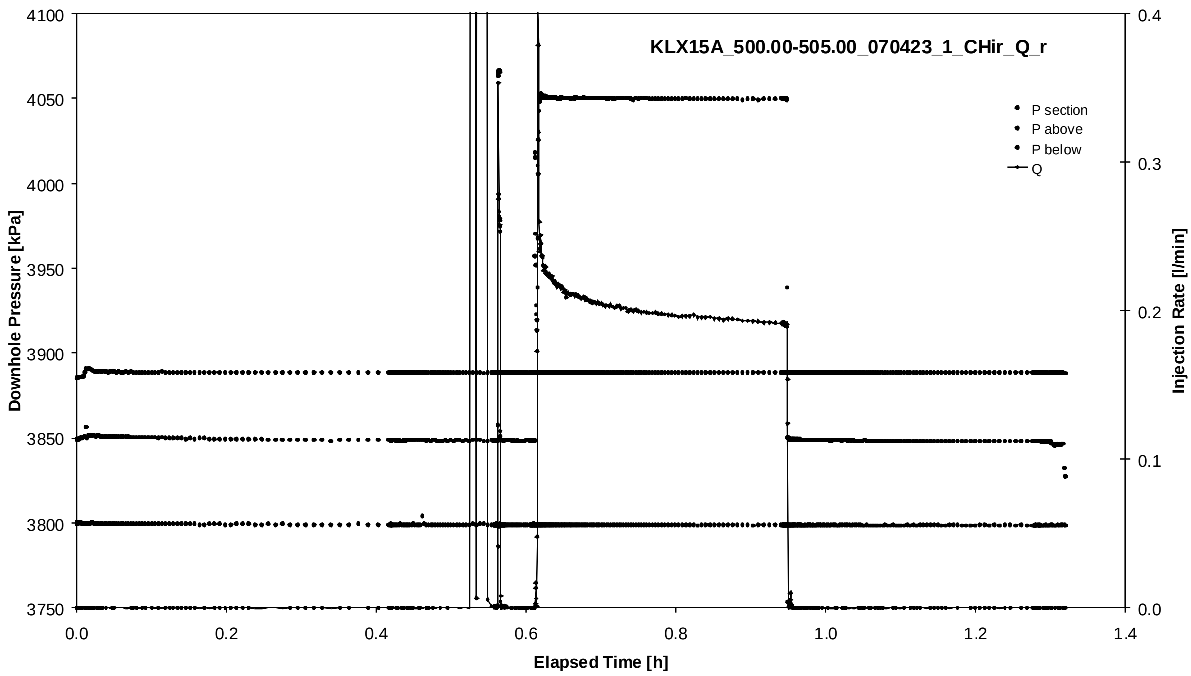
Not analysed

CHIR phase; HORNER match

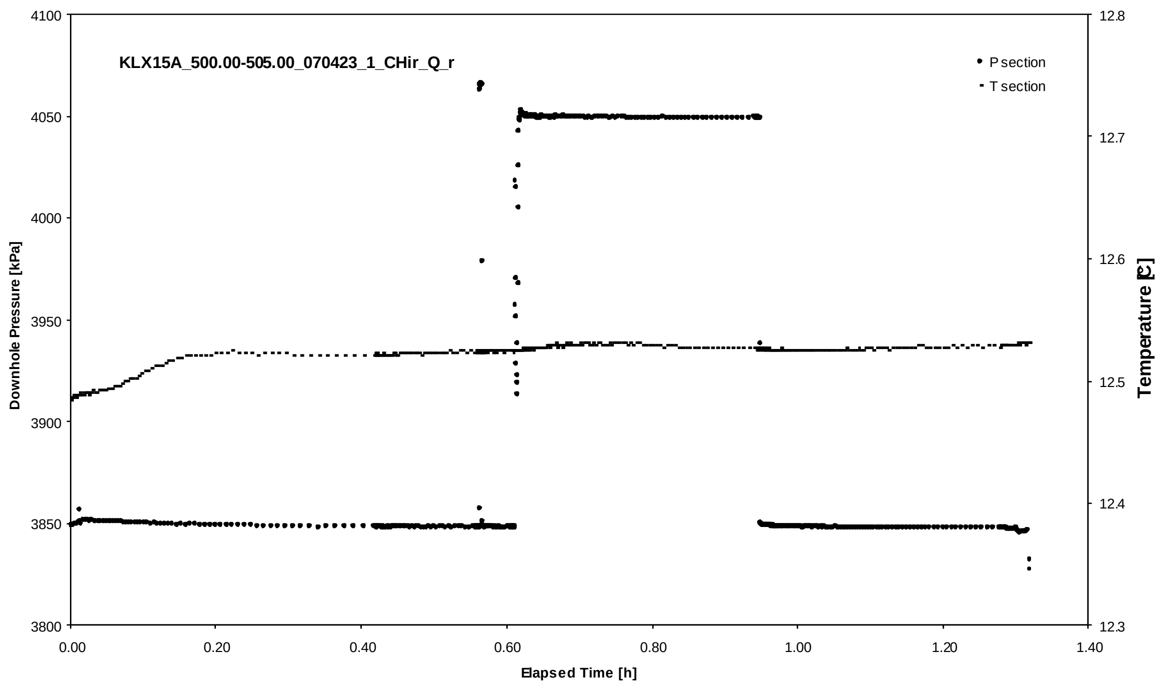
APPENDIX 2-70

Test 500.00 – 505.00 m

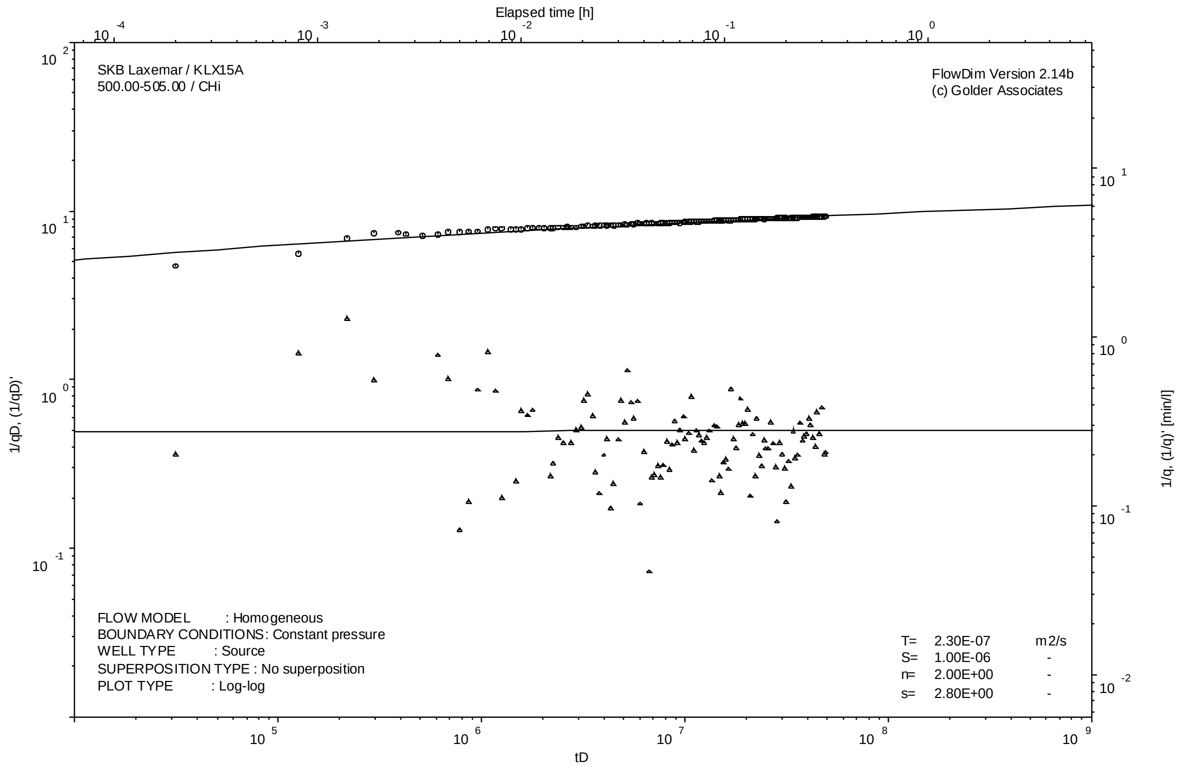
Analysis diagrams



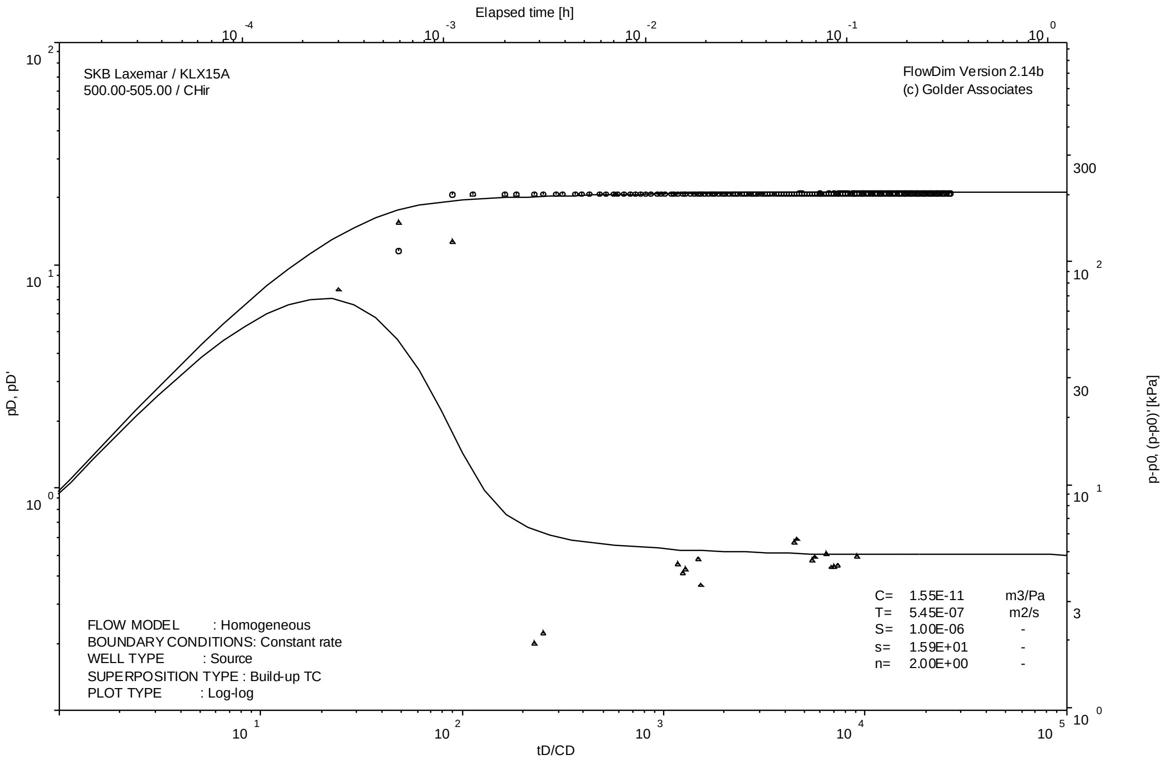
Pressure and flow rate vs. time; cartesian plot



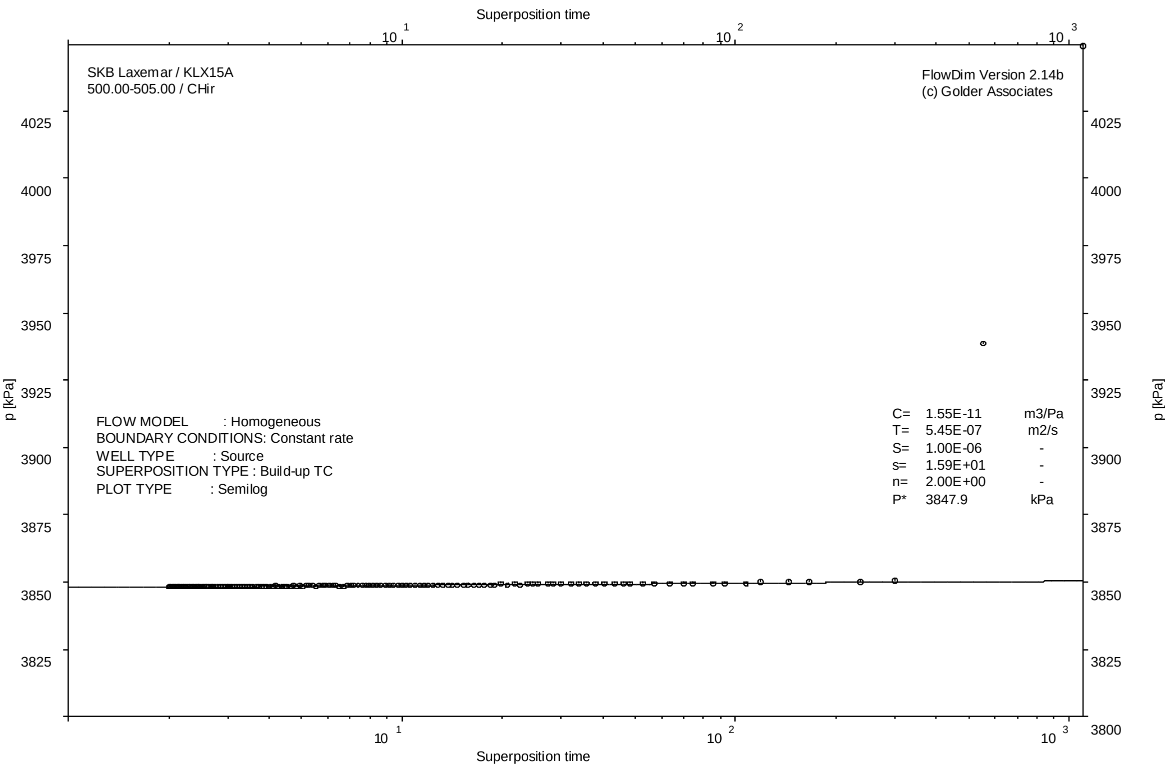
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

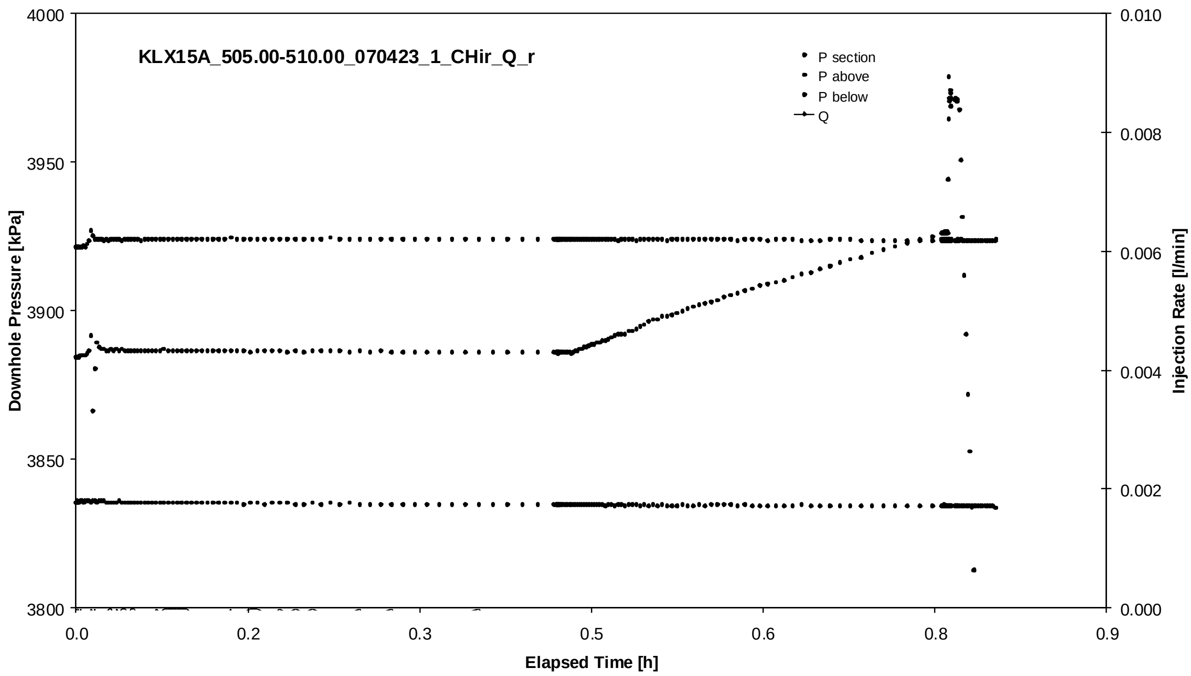


CHIR phase; HORNER match

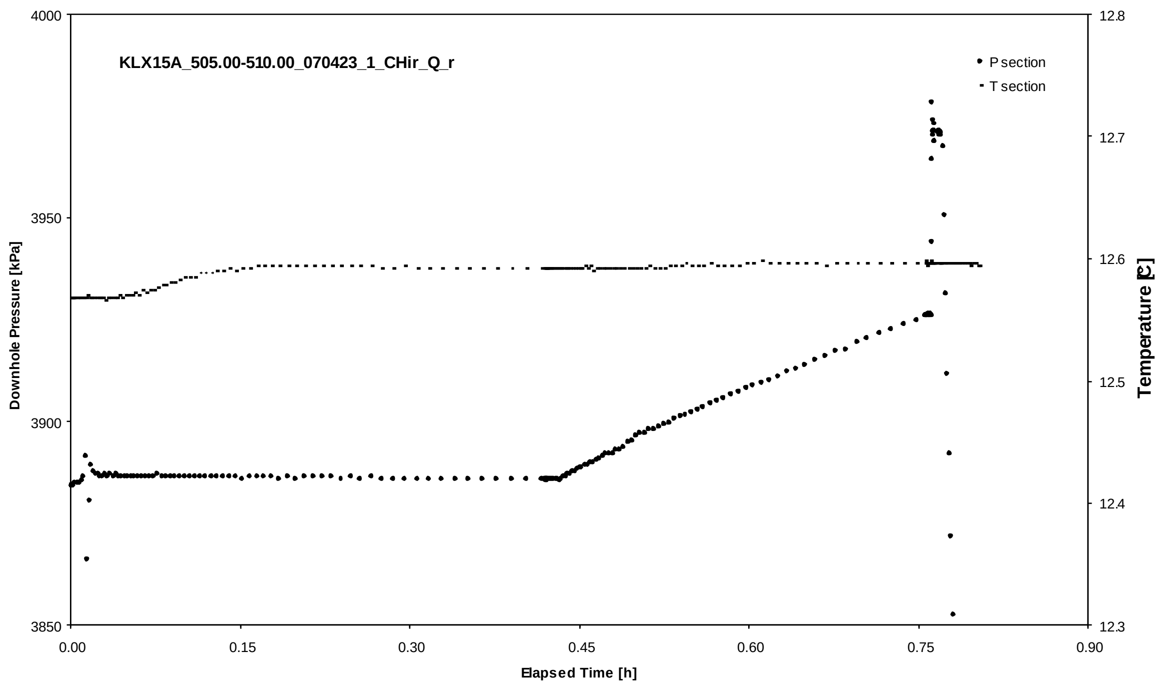
APPENDIX 2-71

Test 505.00 – 510.00 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

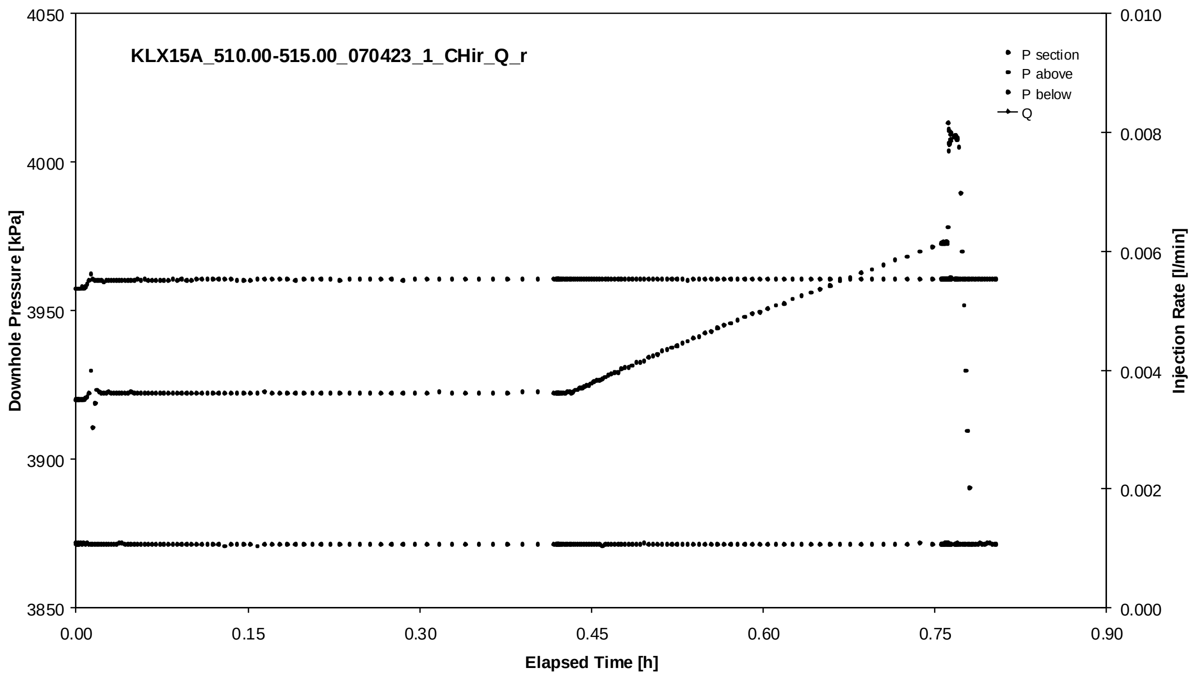
Not analysed

CHIR phase; HORNER match

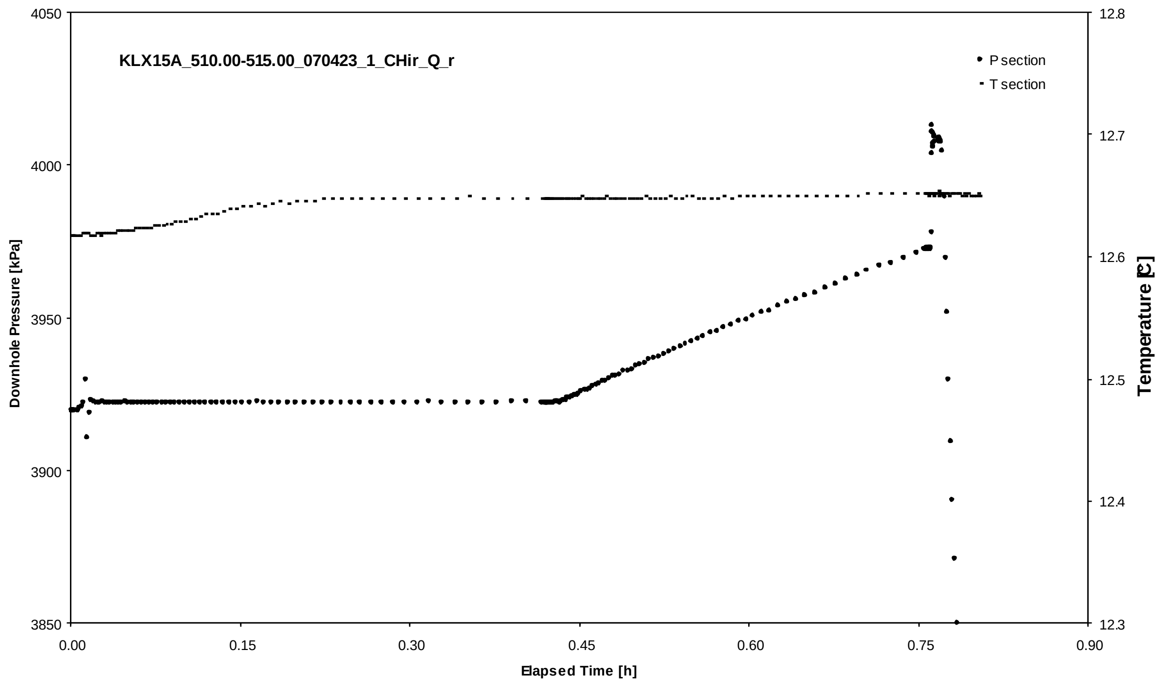
APPENDIX 2-72

Test 510.00 – 515.00 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

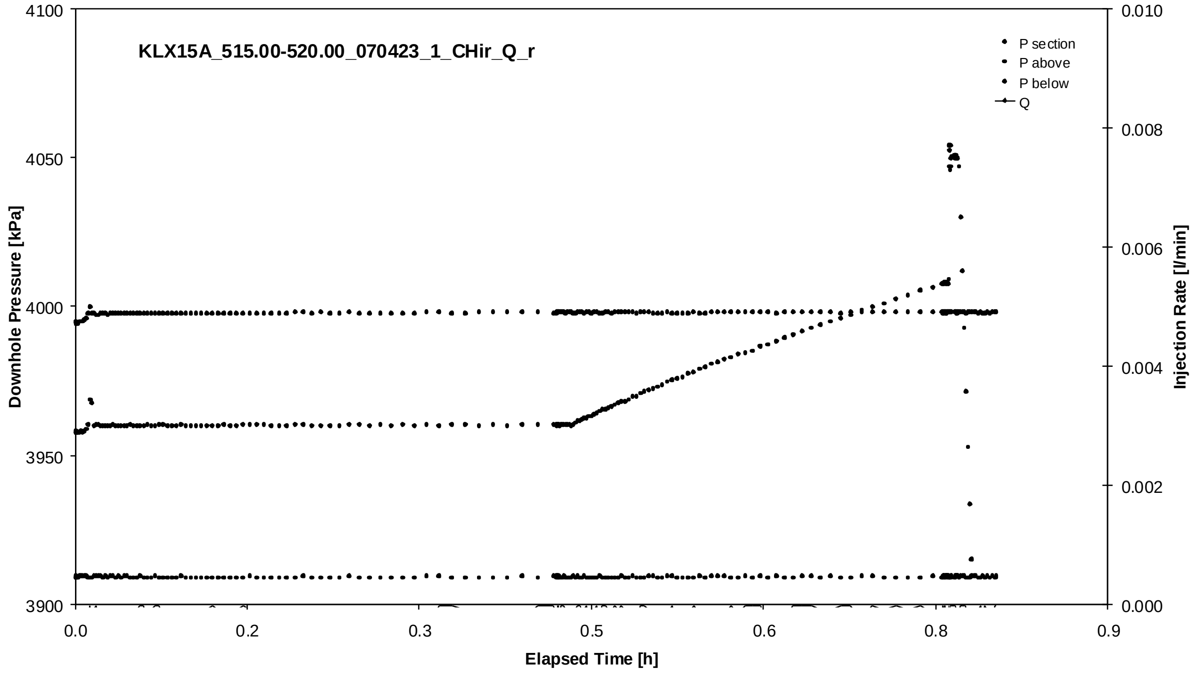
Not analysed

CHIR phase; HORNER match

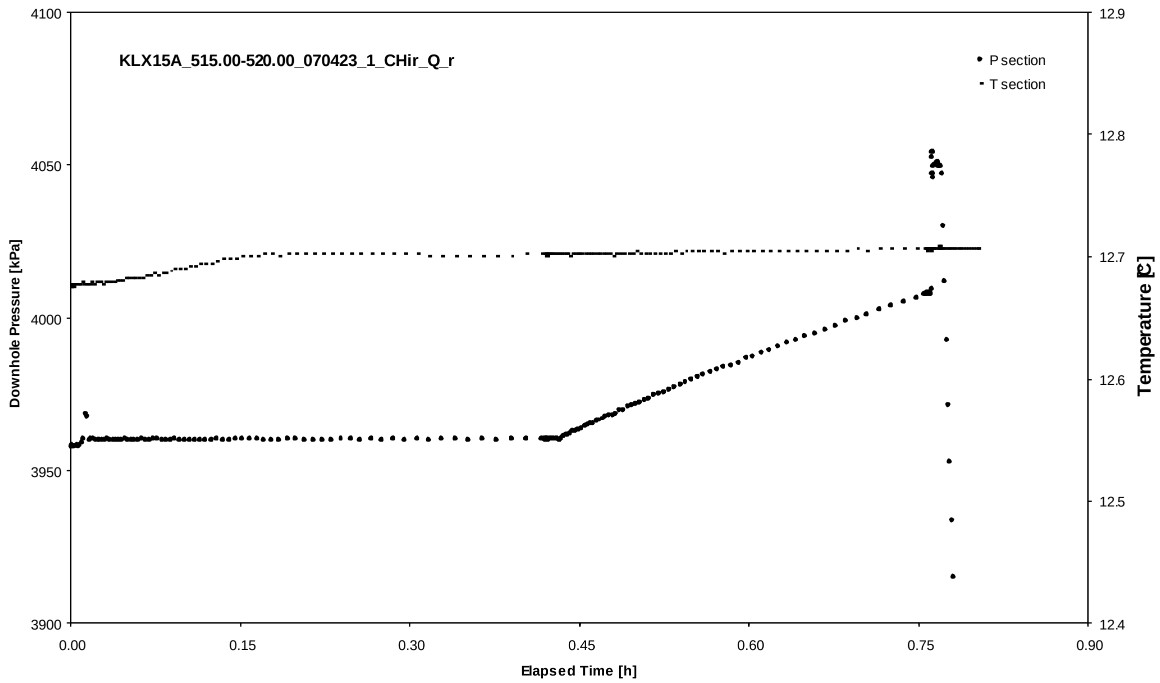
APPENDIX 2-73

Test 515.00 – 520.00 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

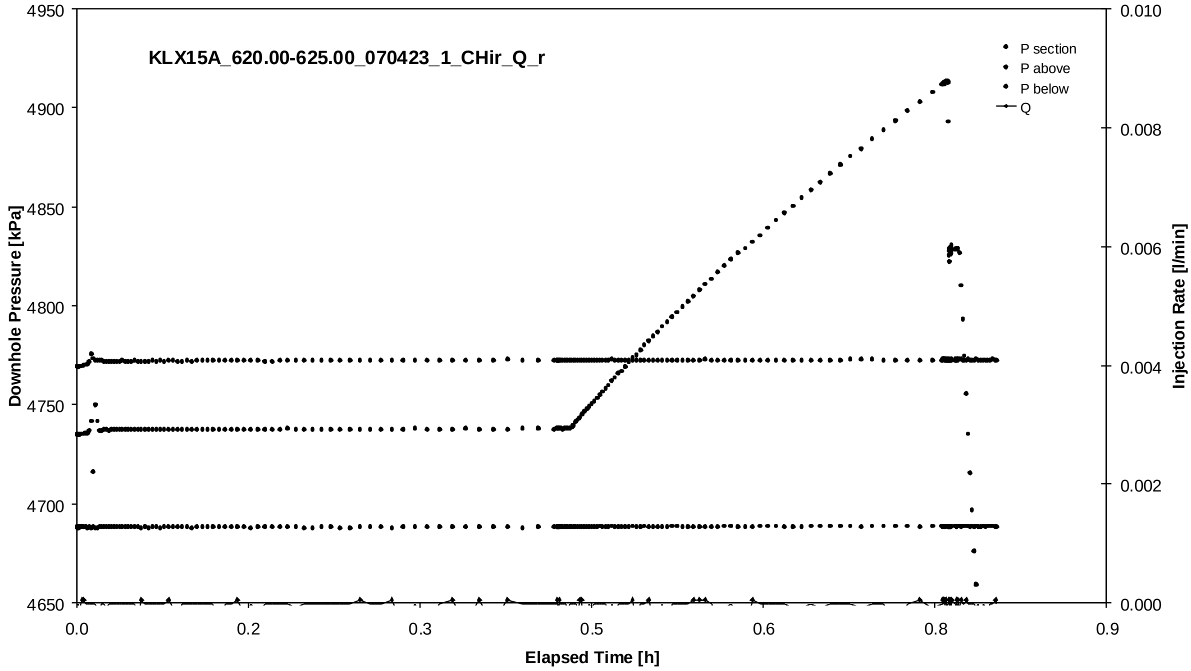
Not analysed

CHIR phase; HORNER match

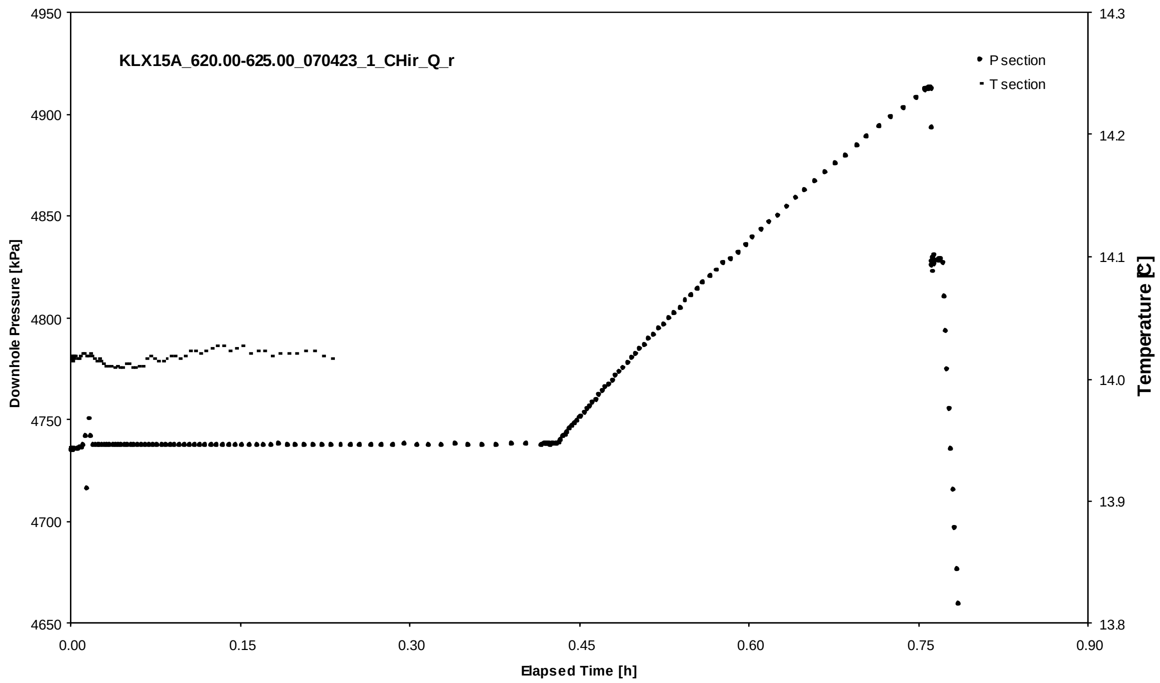
APPENDIX 2-74

Test 620.00 – 625.00 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

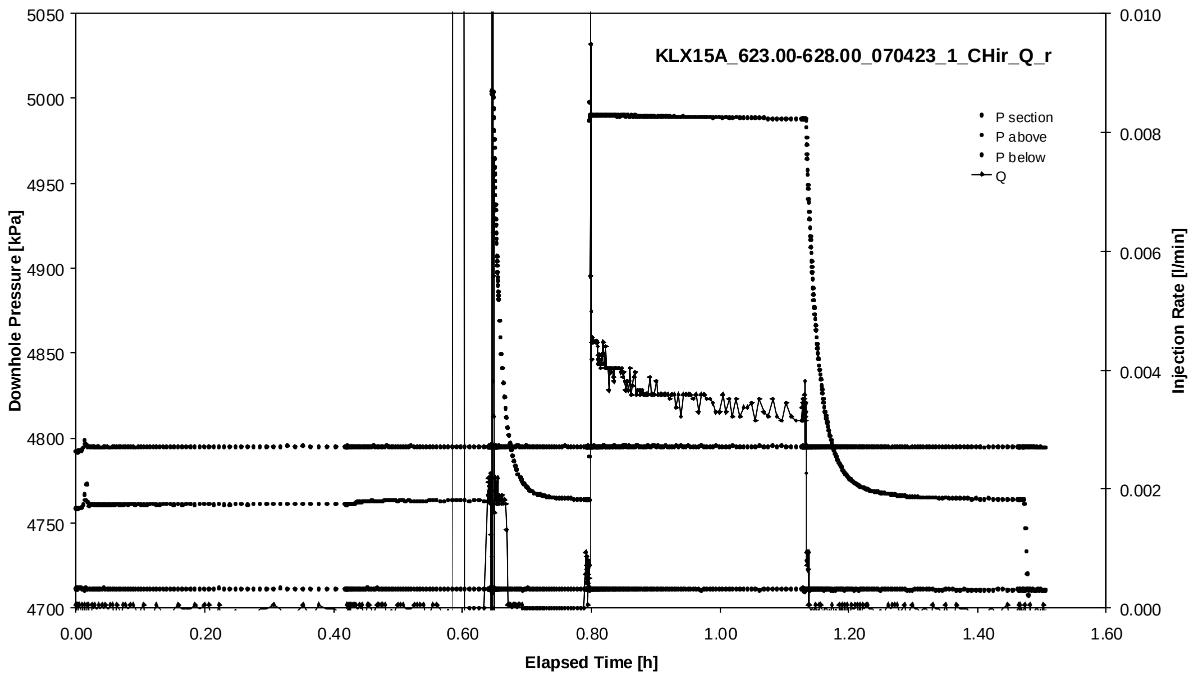
Not analysed

CHIR phase; HORNER match

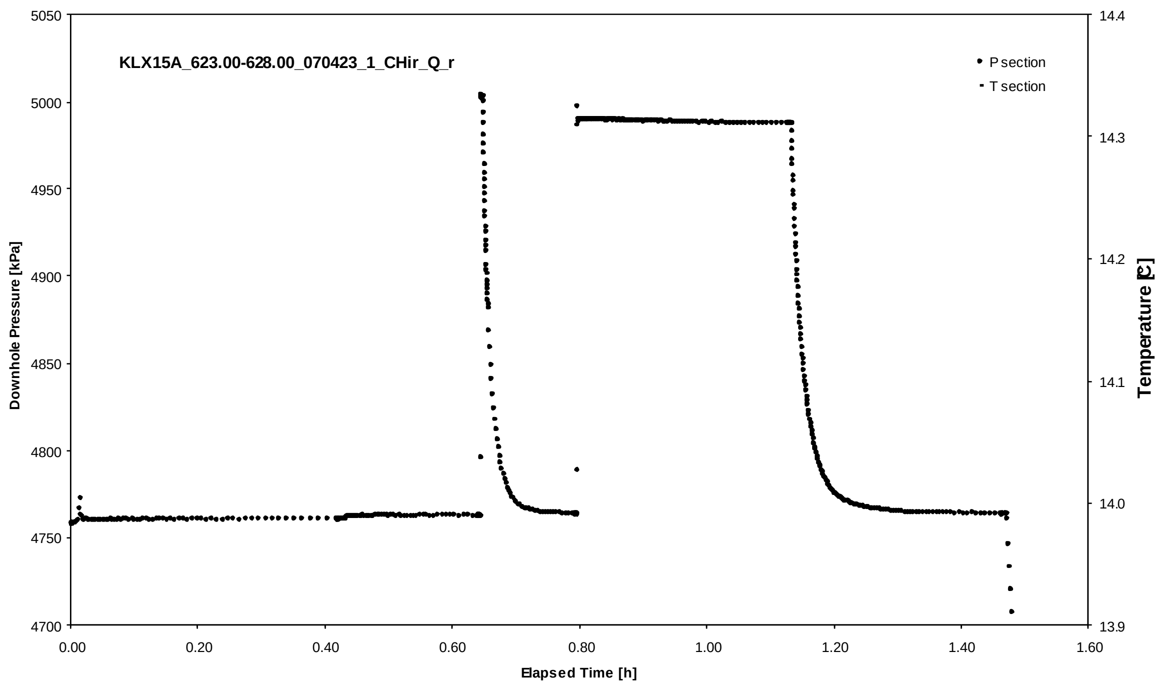
APPENDIX 2-75

Test 623.00 – 628.00 m

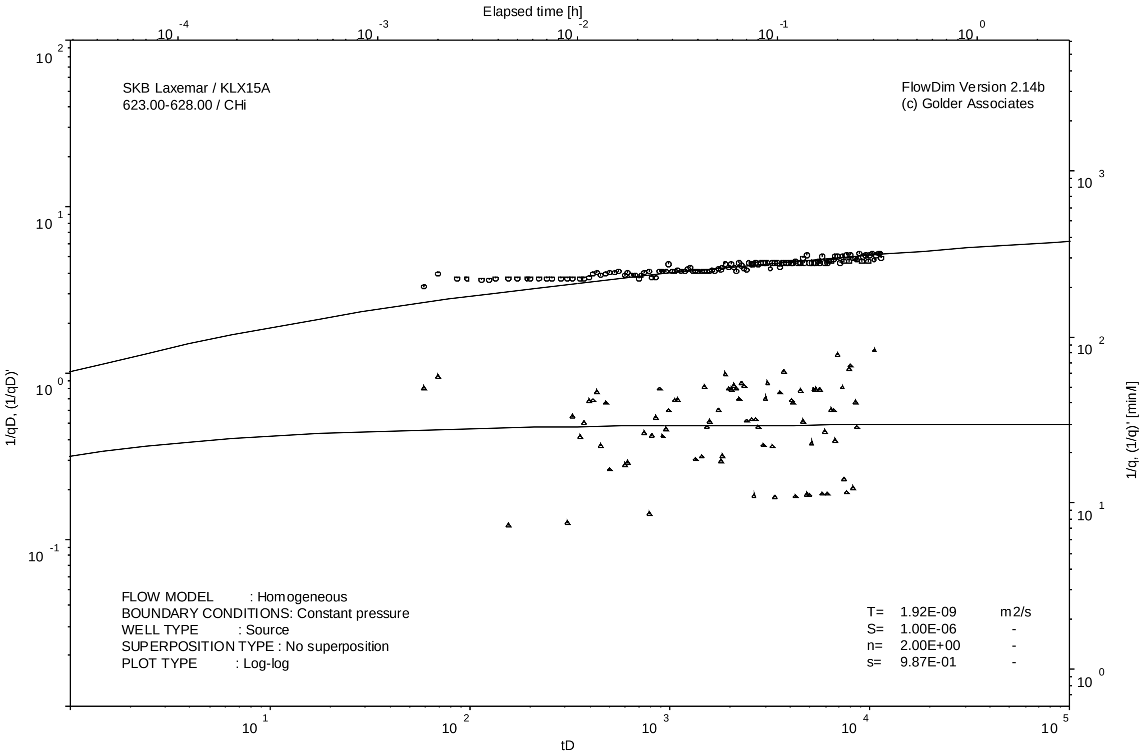
Analysis diagrams



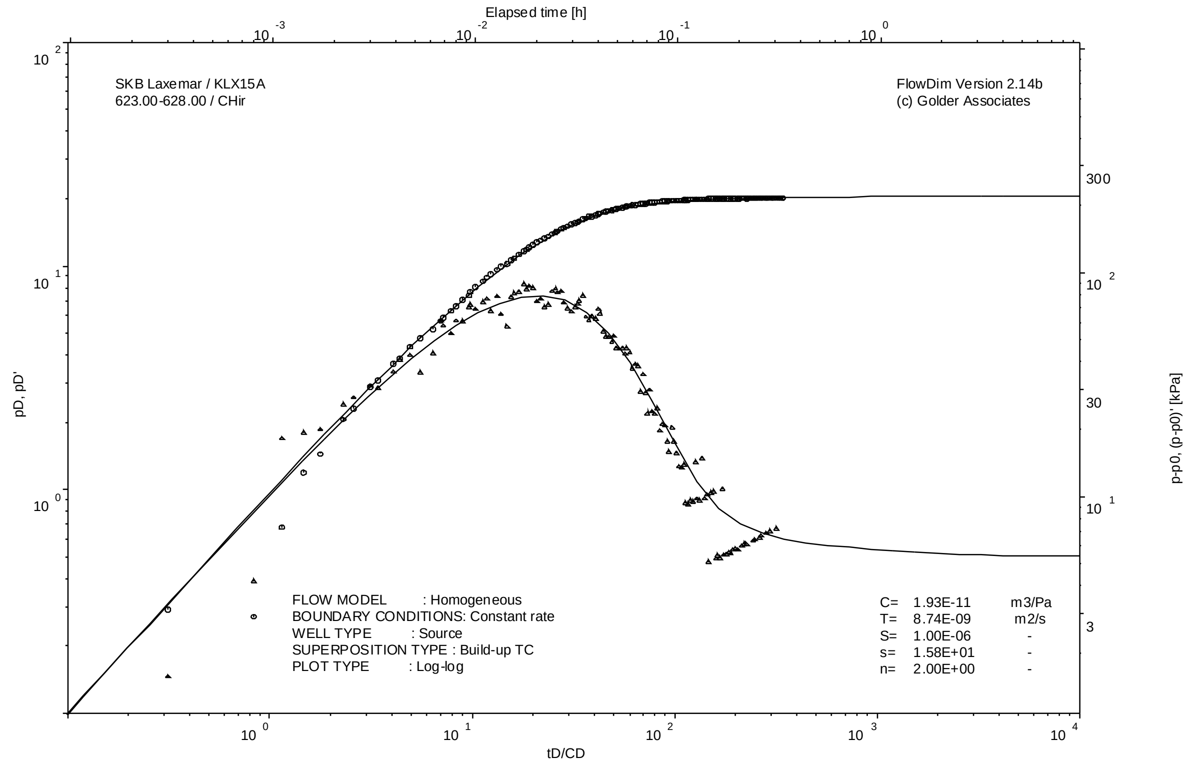
Pressure and flow rate vs. time; cartesian plot



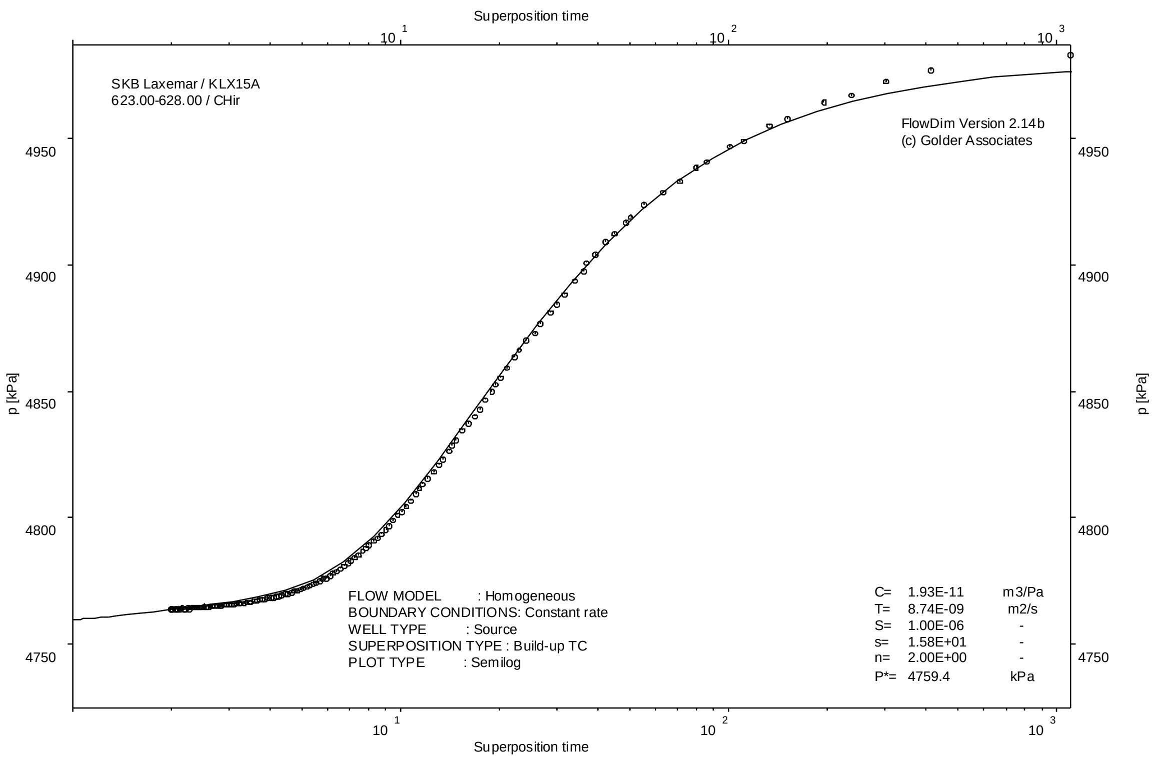
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

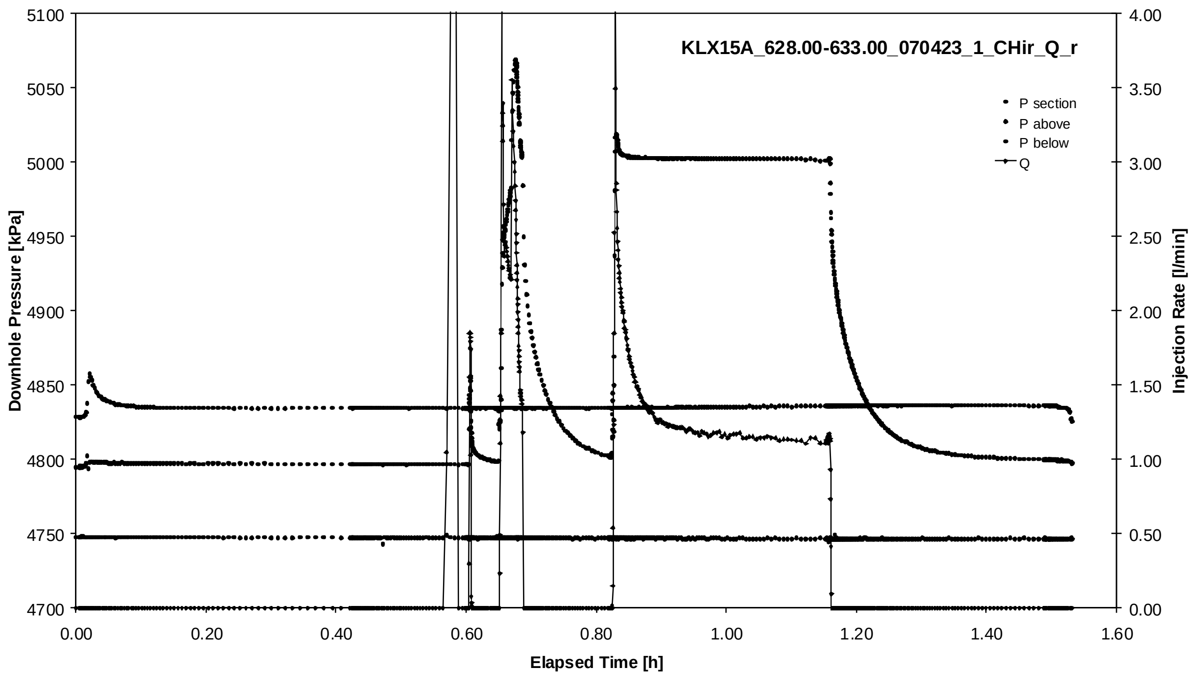


CHIR phase; HORNER match

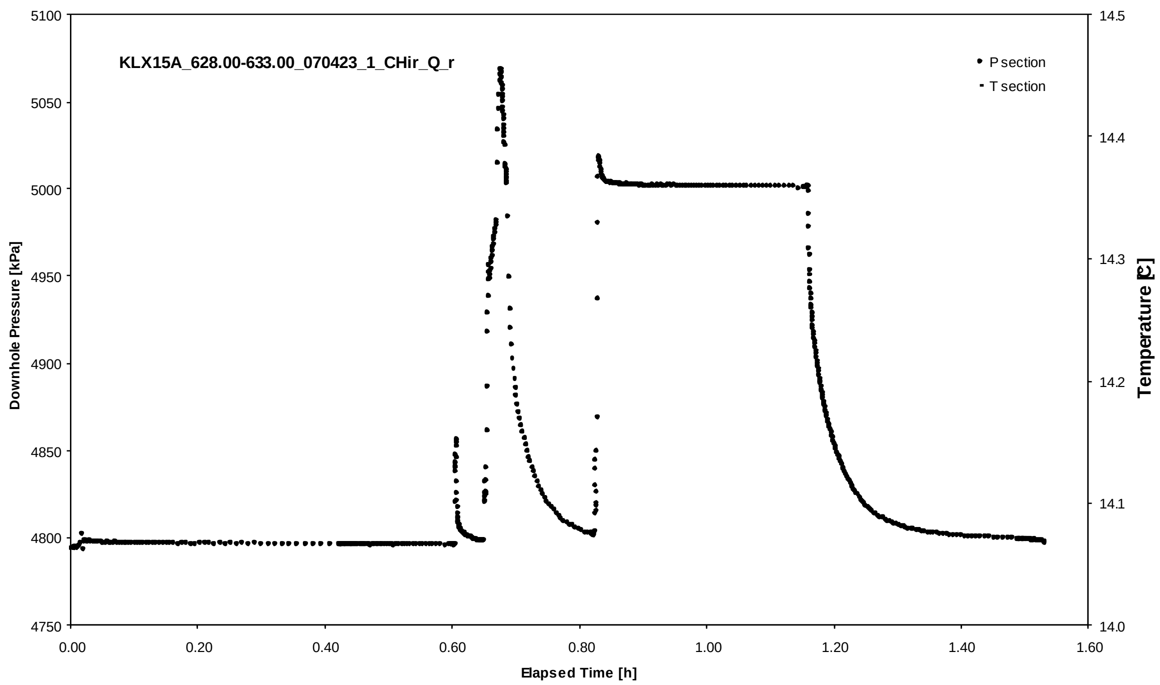
APPENDIX 2-76

Test 628.00 – 633.00 m

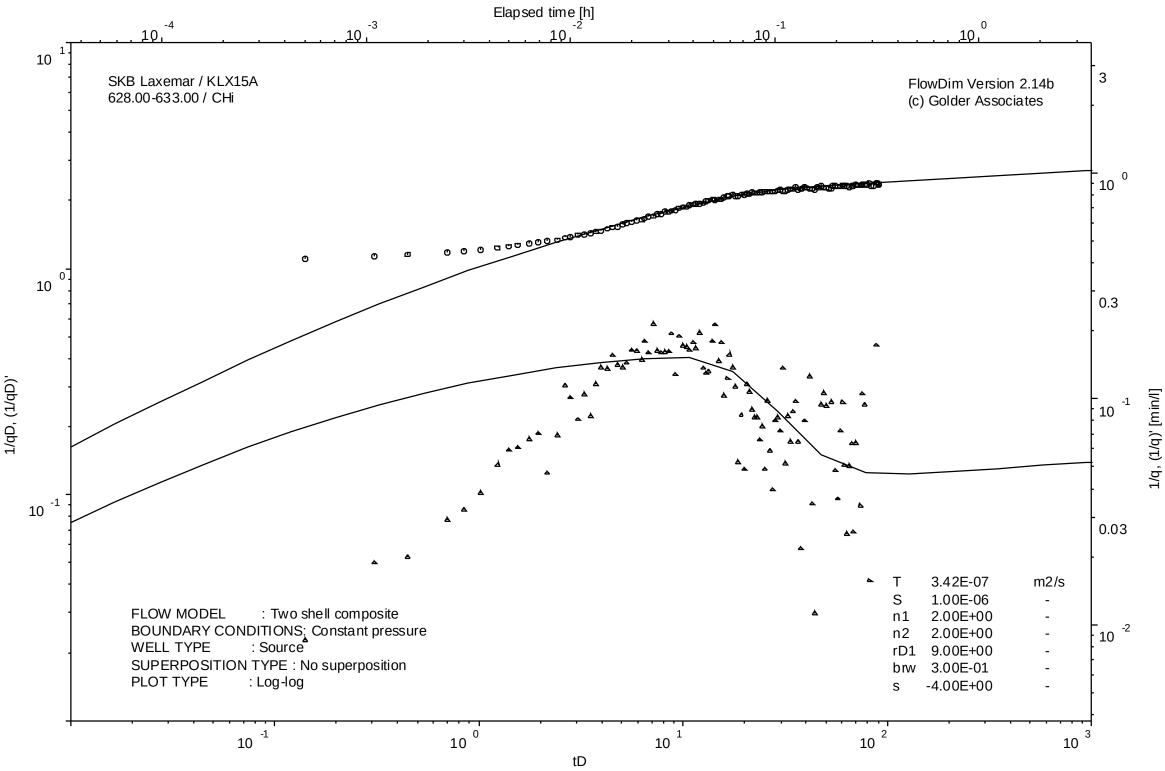
Analysis diagrams



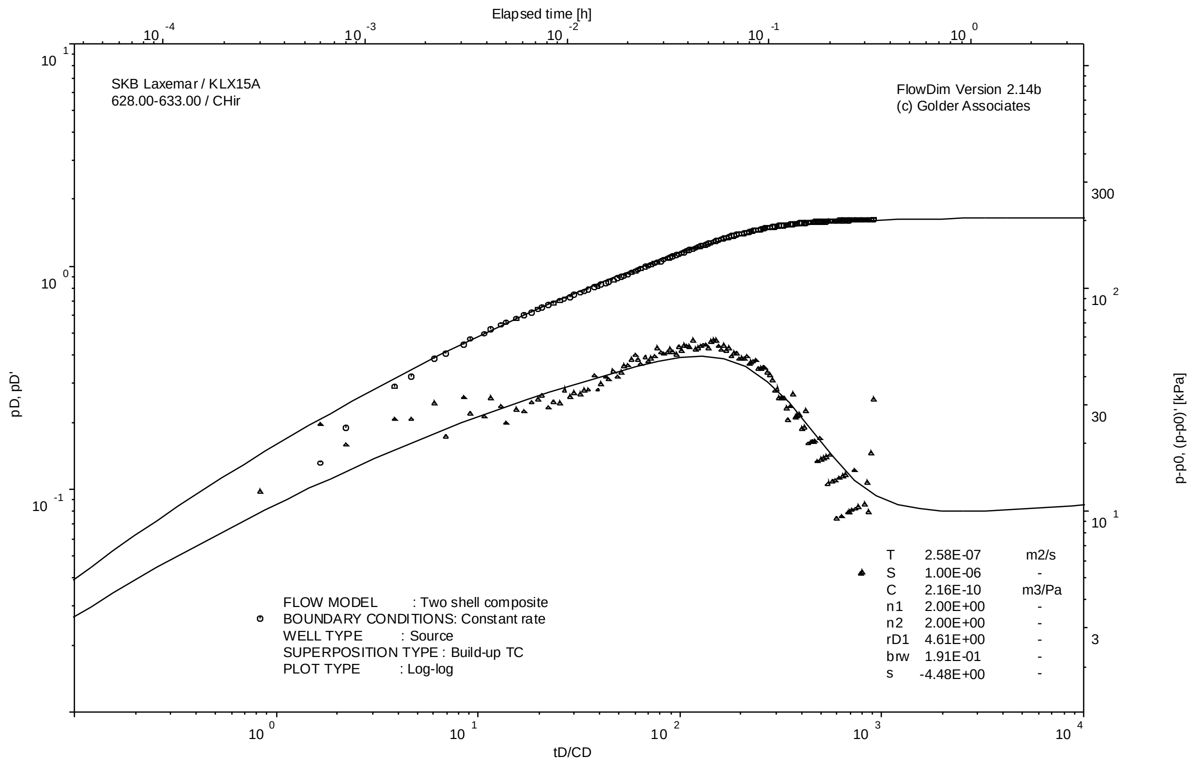
Pressure and flow rate vs. time; cartesian plot



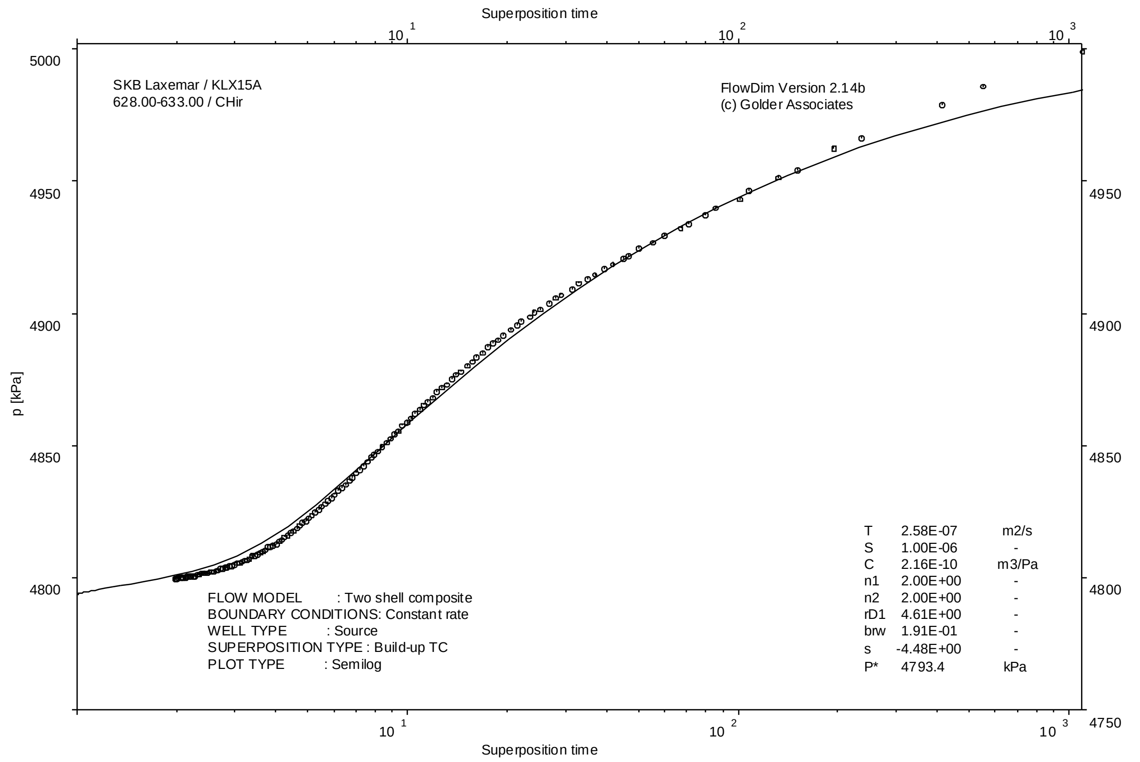
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

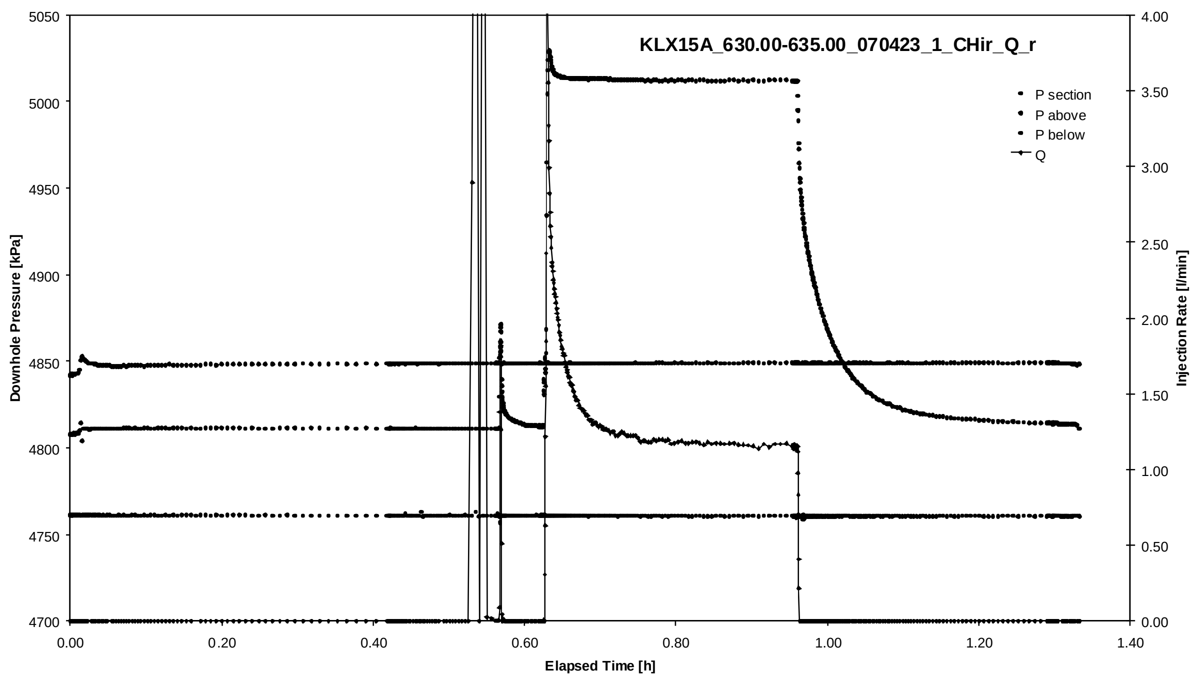


CHIR phase; HORNER match

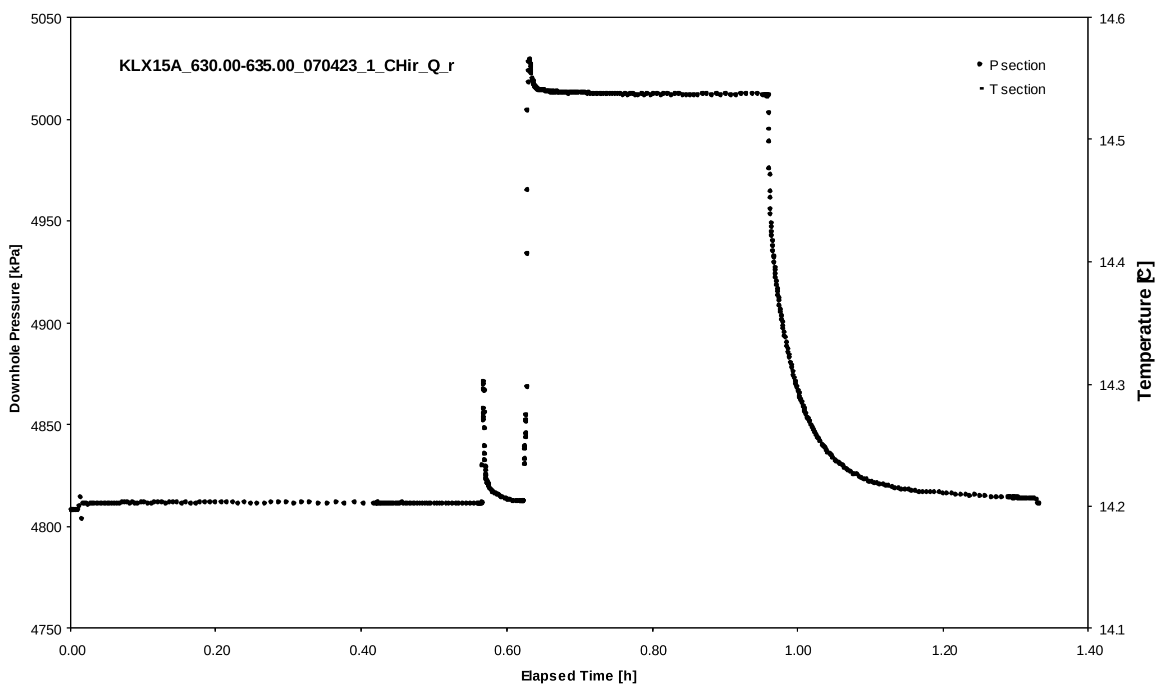
APPENDIX 2-77

Test 630.00 – 635.00 m

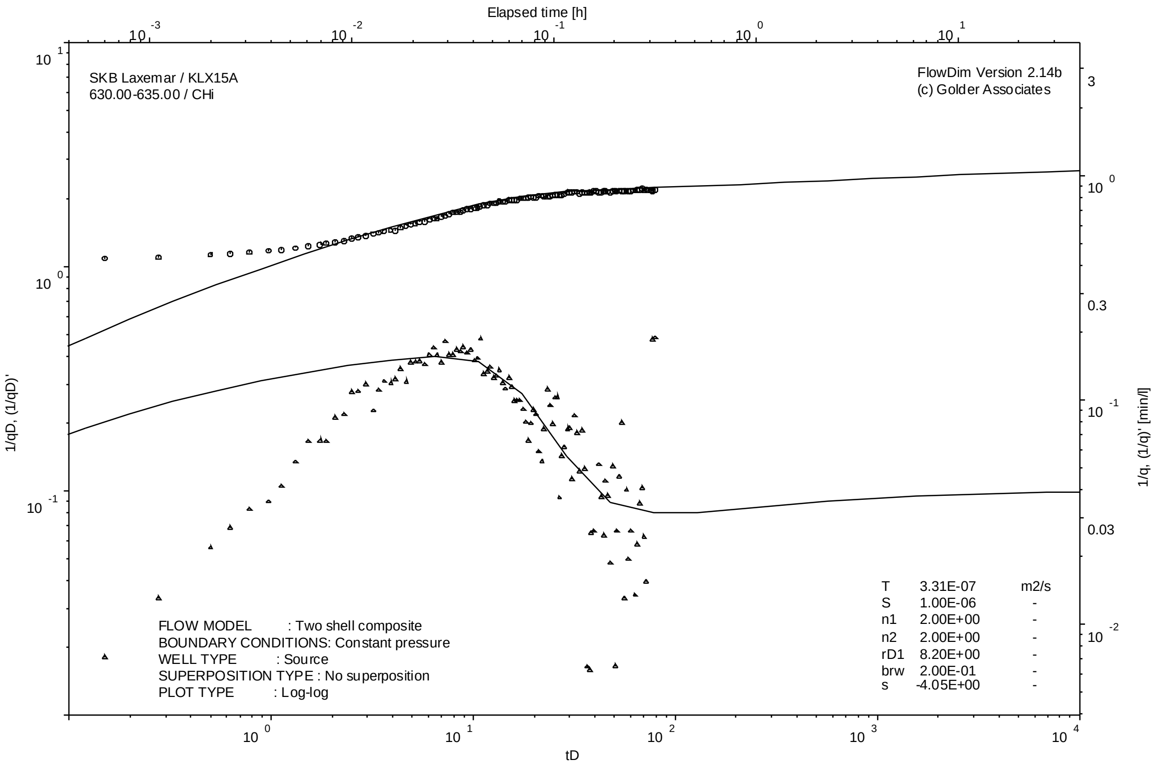
Analysis diagrams



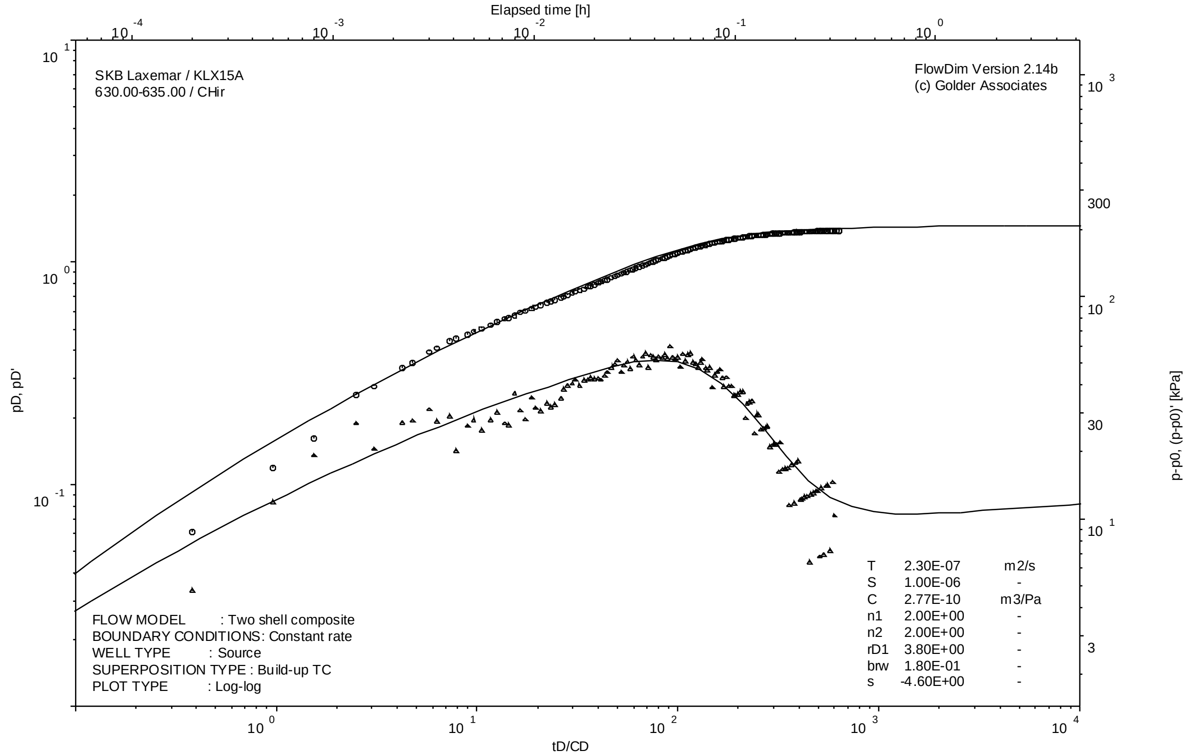
Pressure and flow rate vs. time; cartesian plot



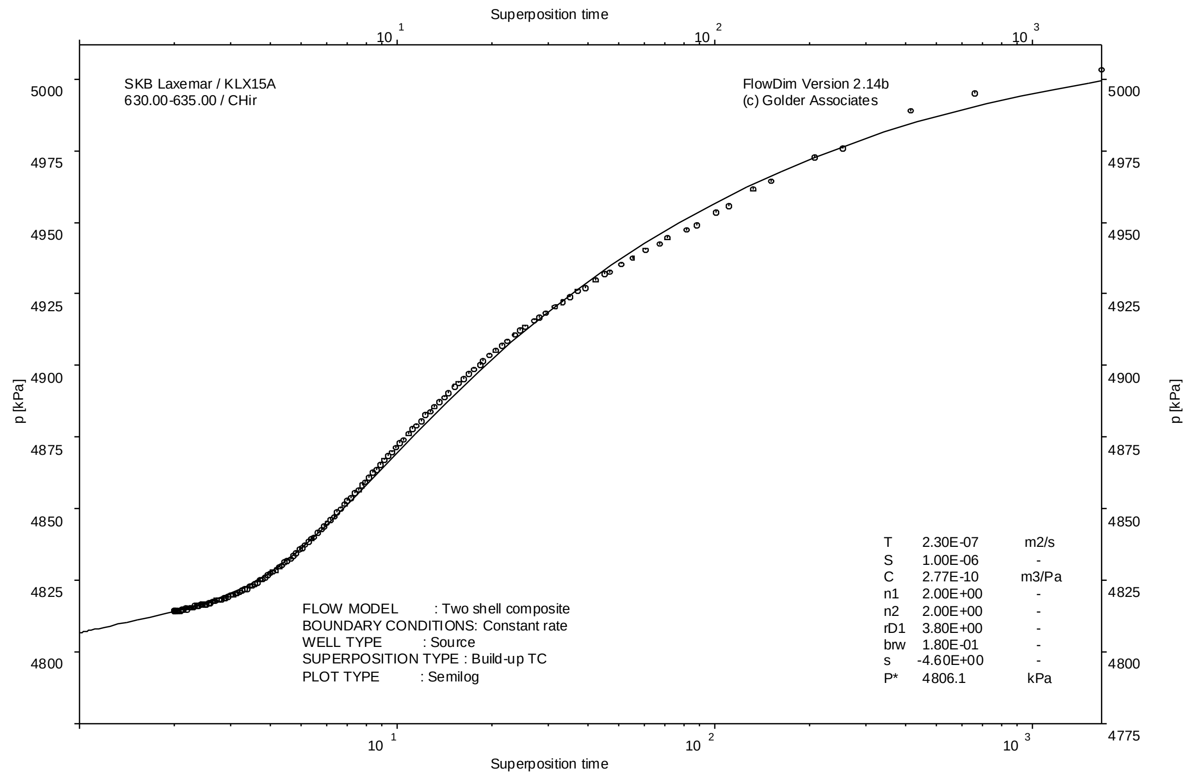
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

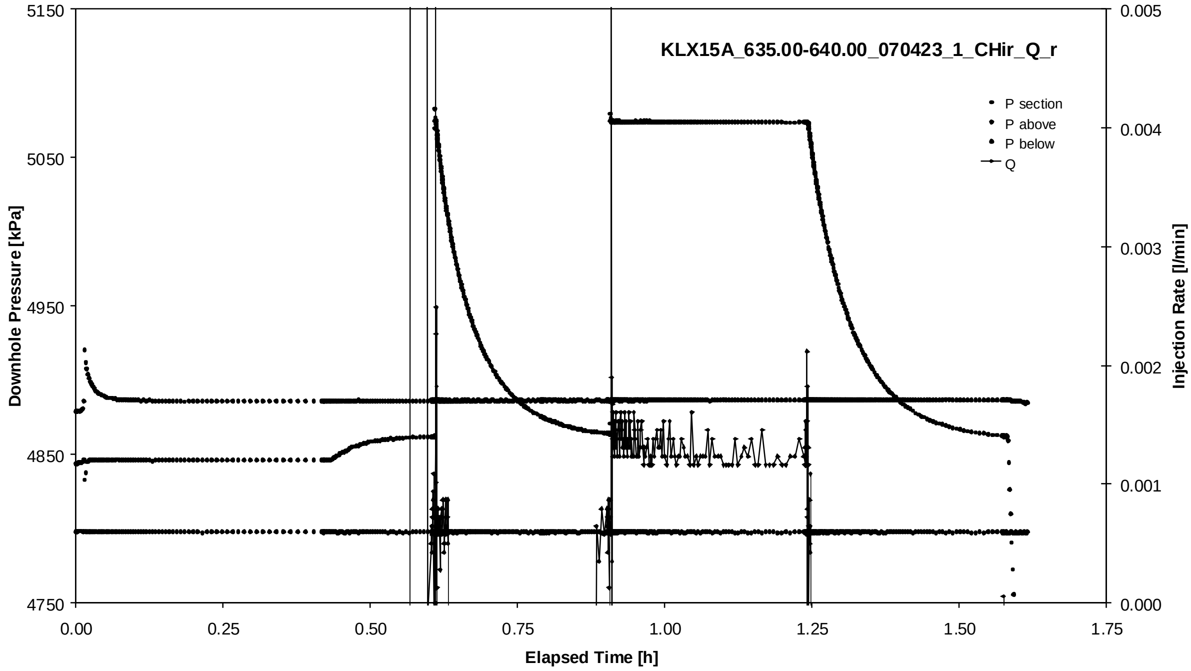


CHIR phase; HORNER match

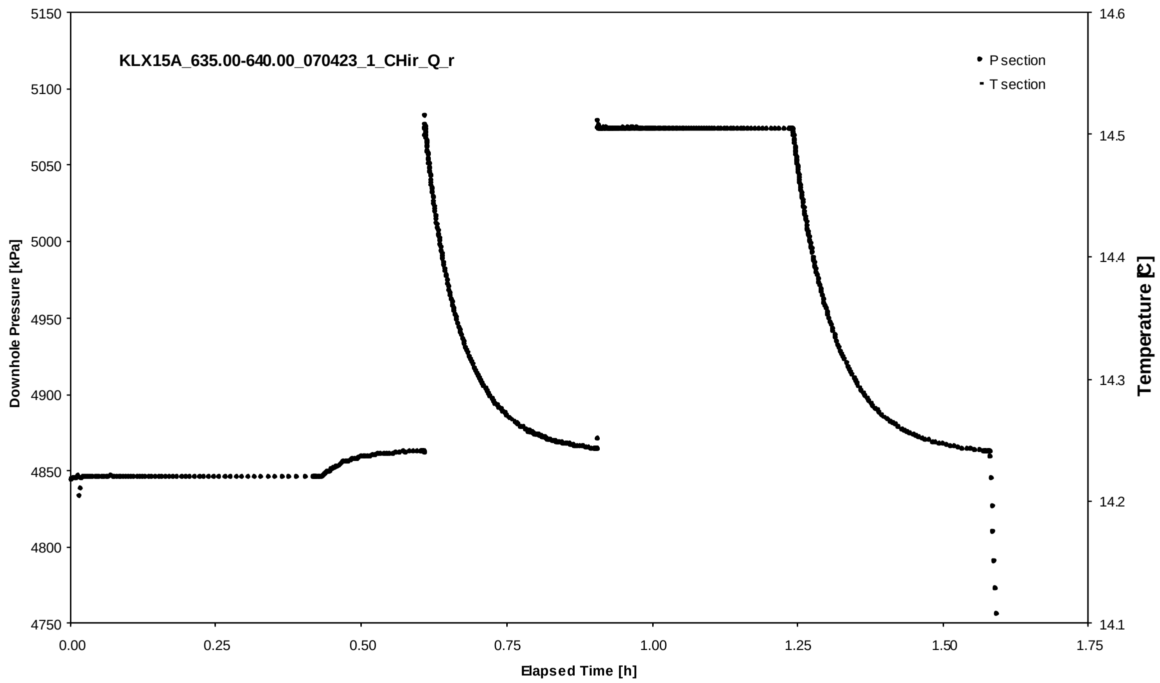
APPENDIX 2-78

Test 635.00 – 640.00 m

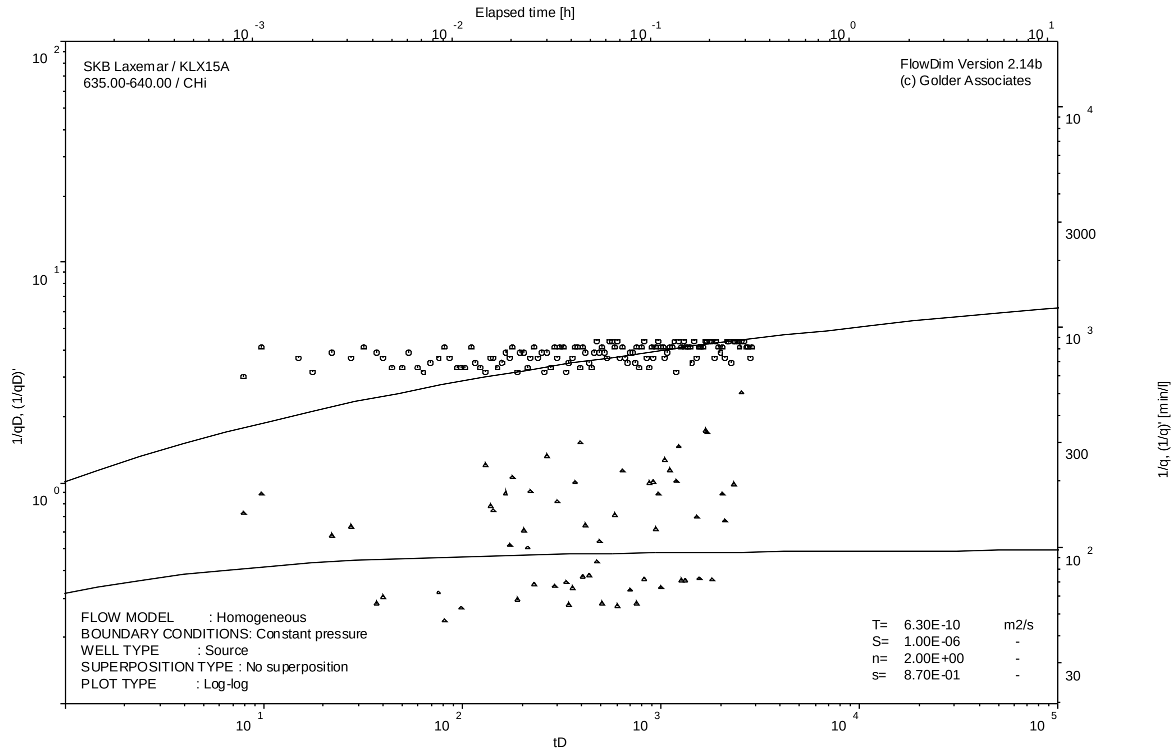
Analysis diagrams



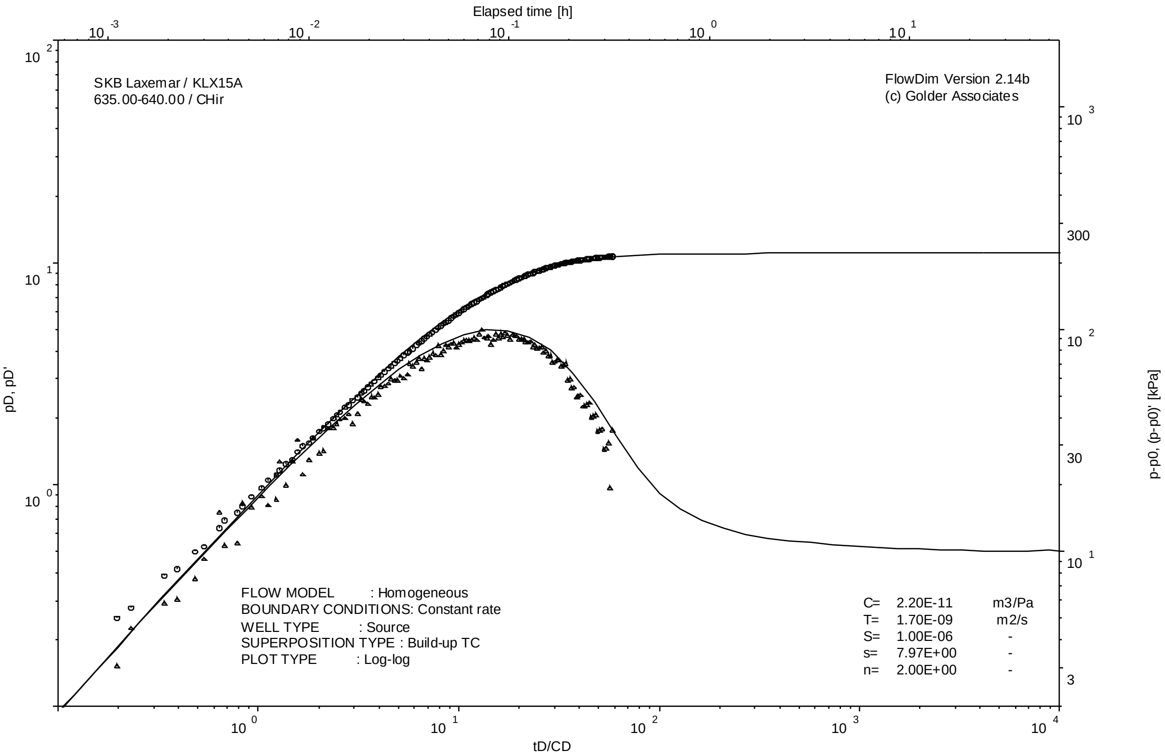
Pressure and flow rate vs. time; cartesian plot



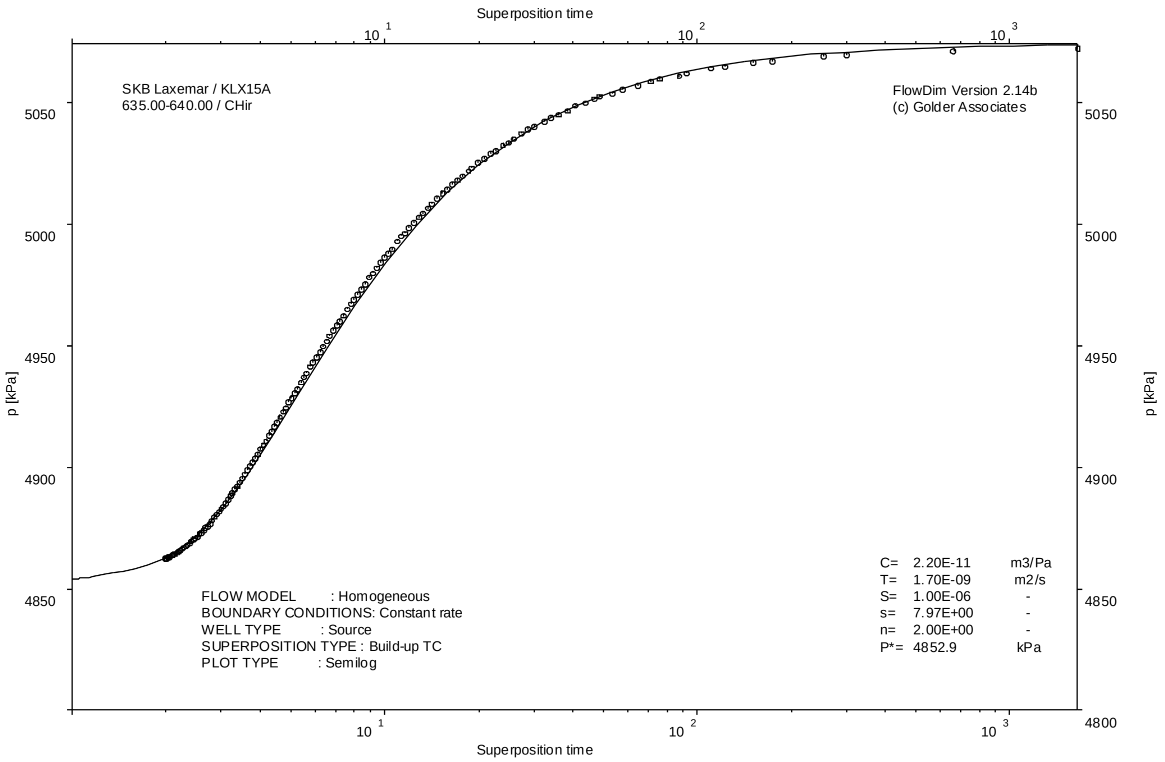
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

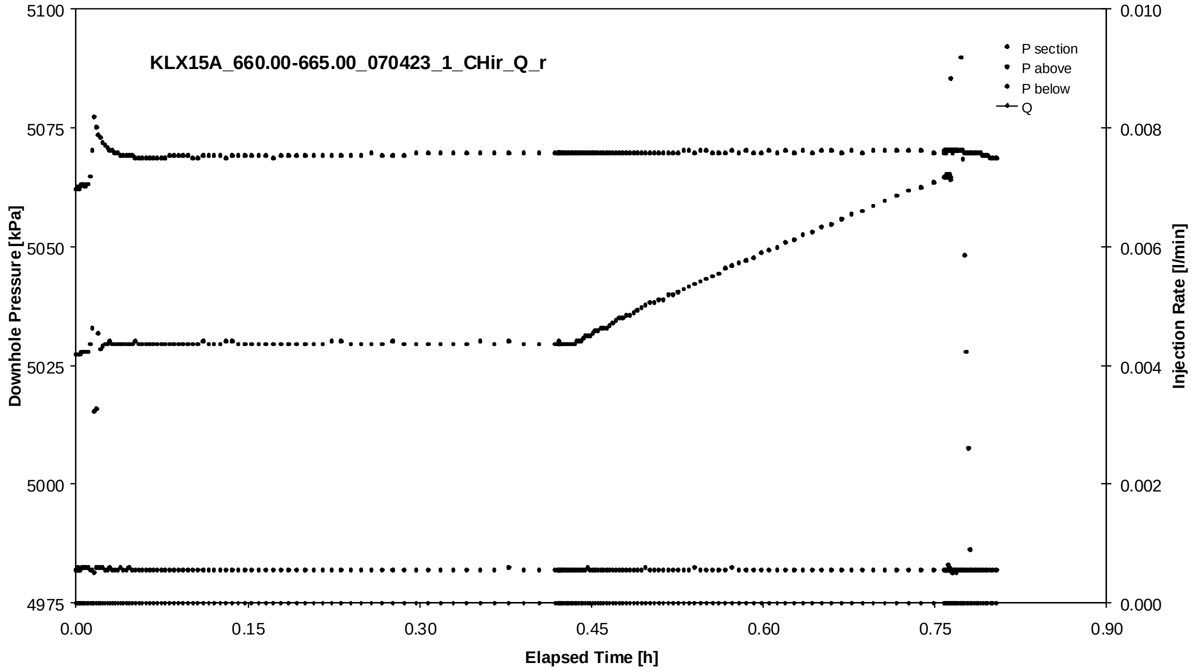


CHIR phase; HORNER match

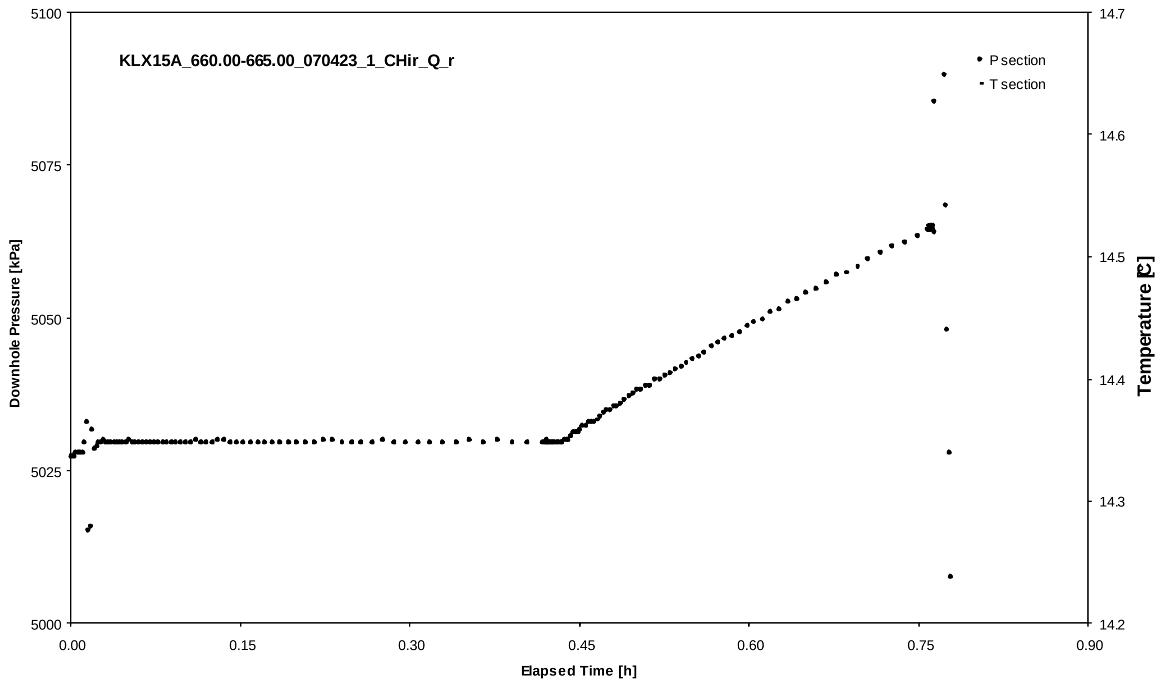
APPENDIX 2-79

Test 660.00 – 665.00 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

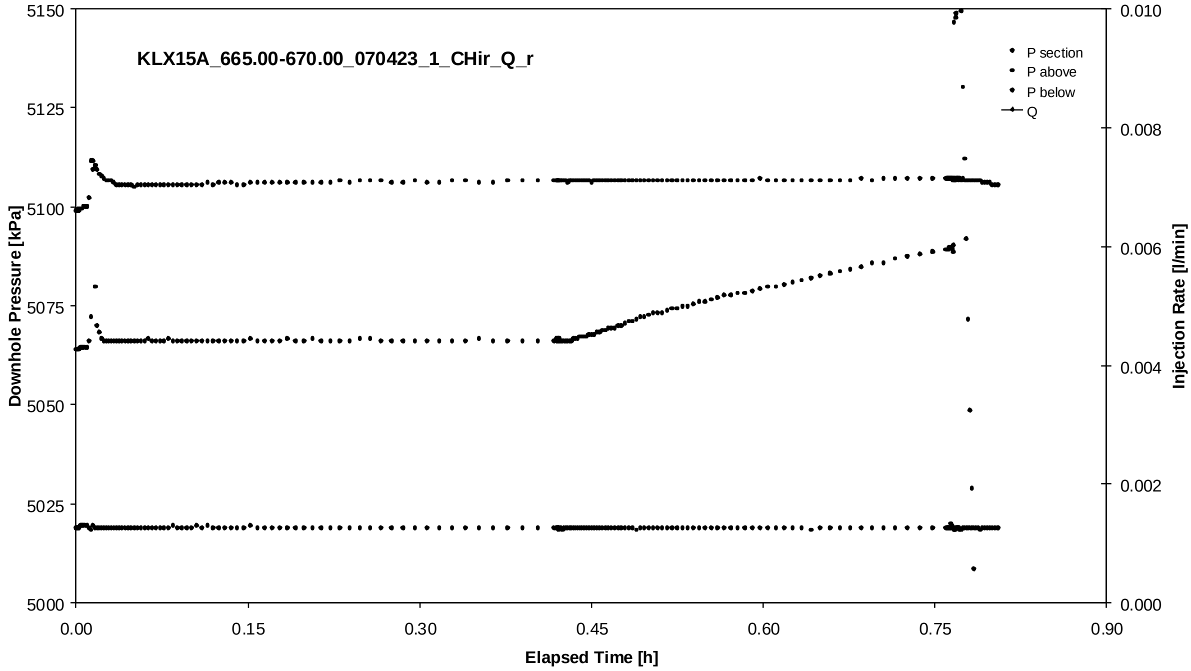
Not analysed

CHIR phase; HORNER match

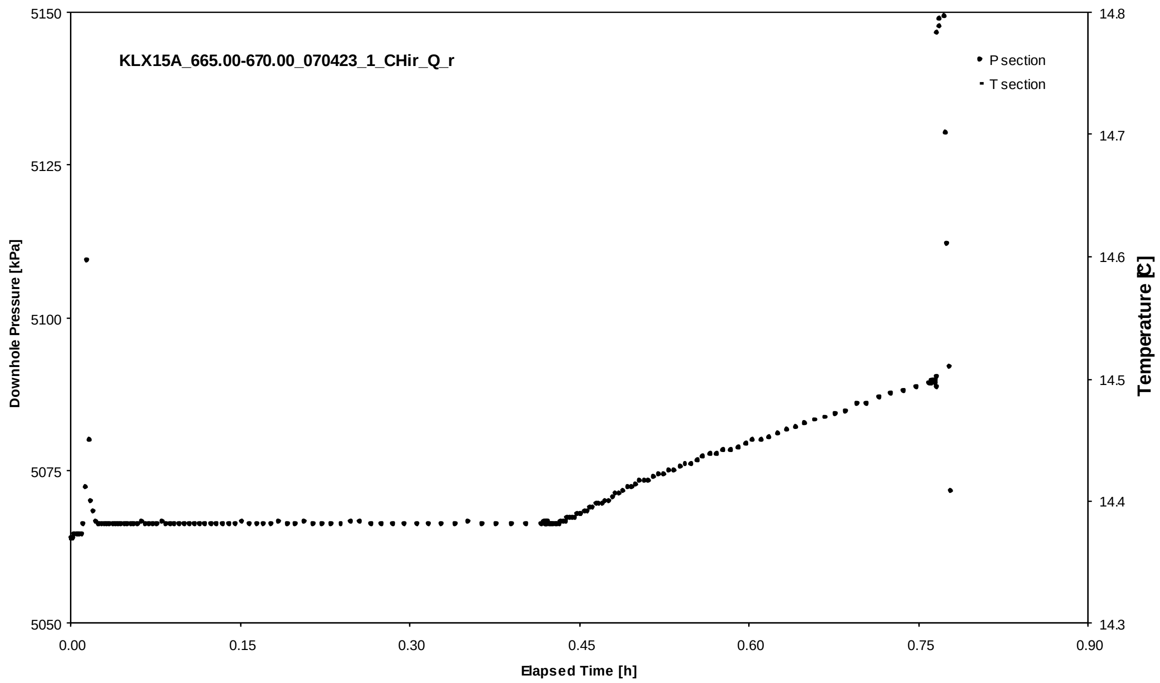
APPENDIX 2-80

Test 665.00 – 670.00 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

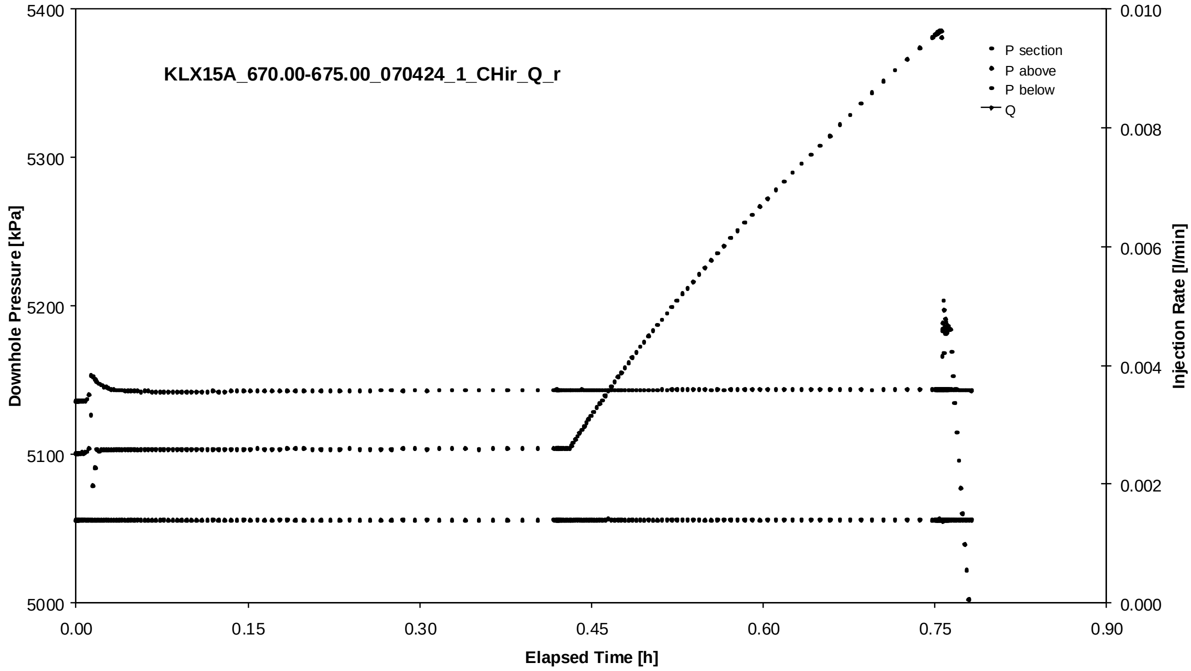
Not analysed

CHIR phase; HORNER match

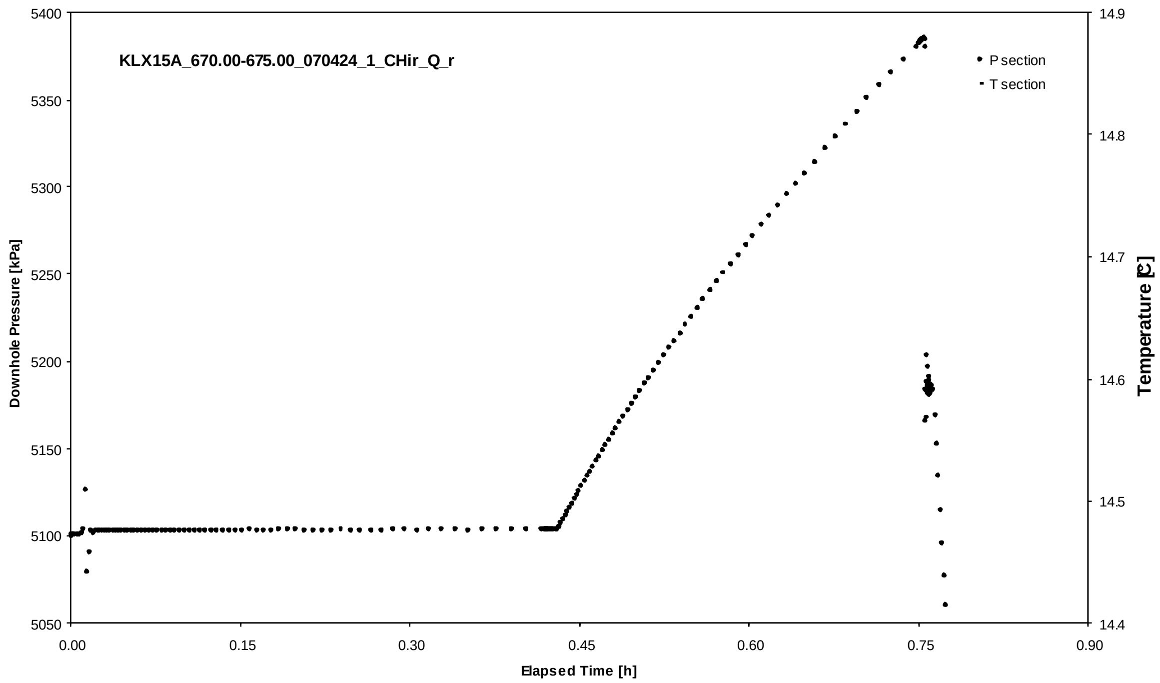
APPENDIX 2-81

Test 670.00 – 675.00 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

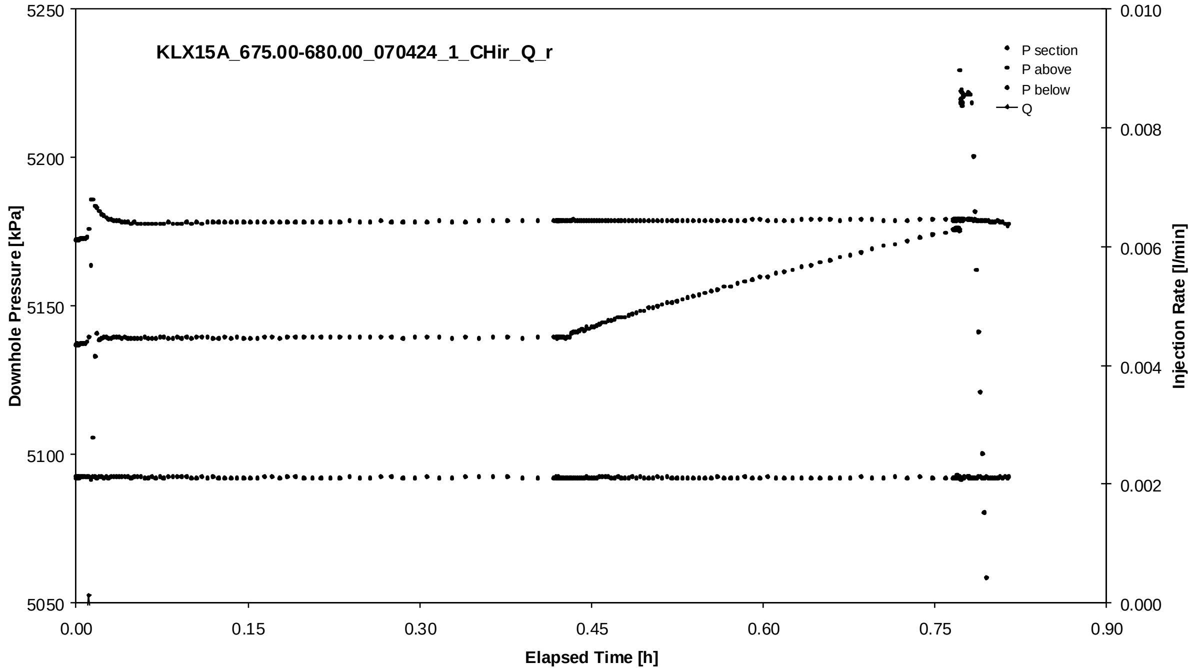
Not analysed

CHIR phase; HORNER match

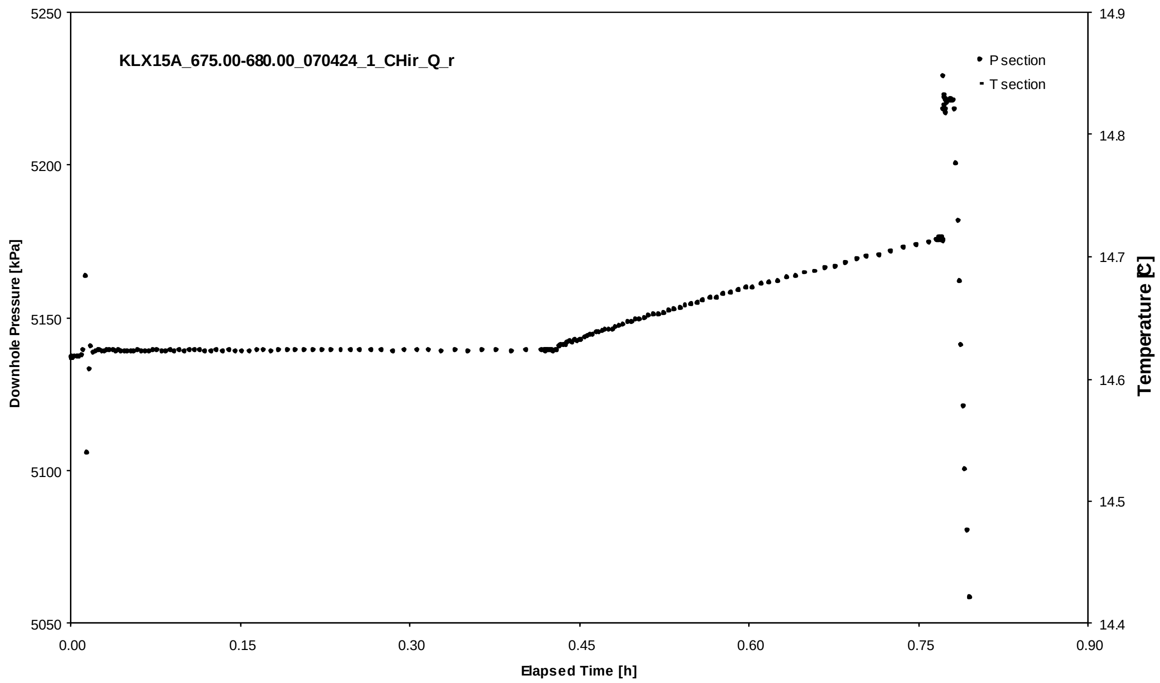
APPENDIX 2-82

Test 675.00 – 680.00 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

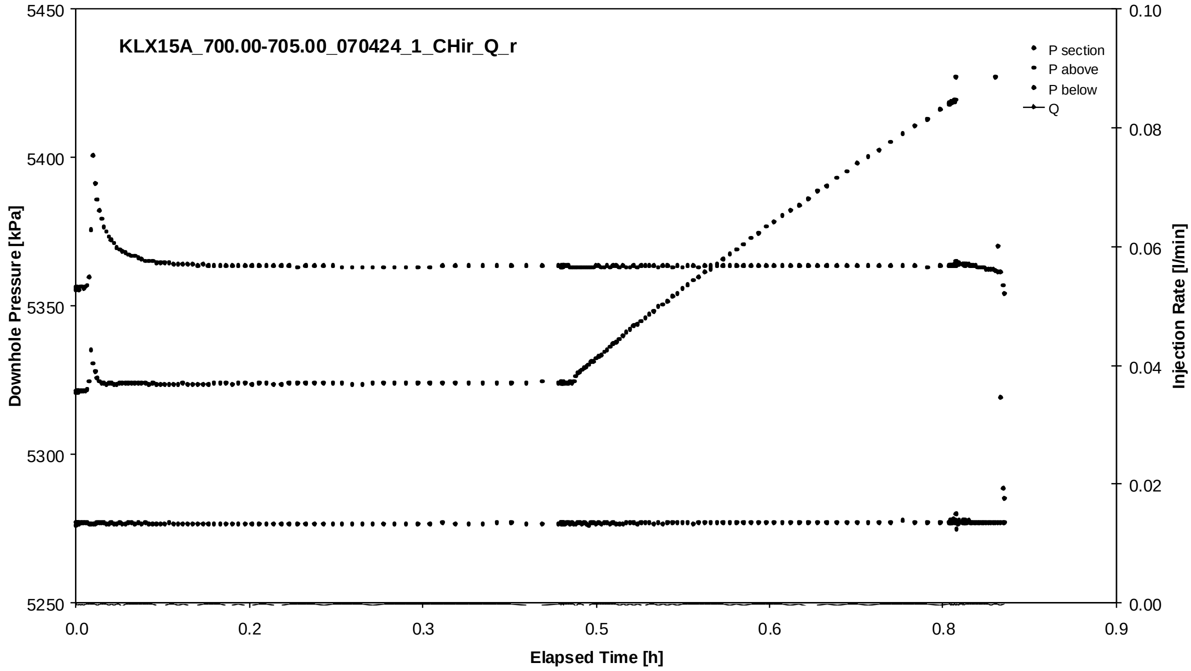
Not analysed

CHIR phase; HORNER match

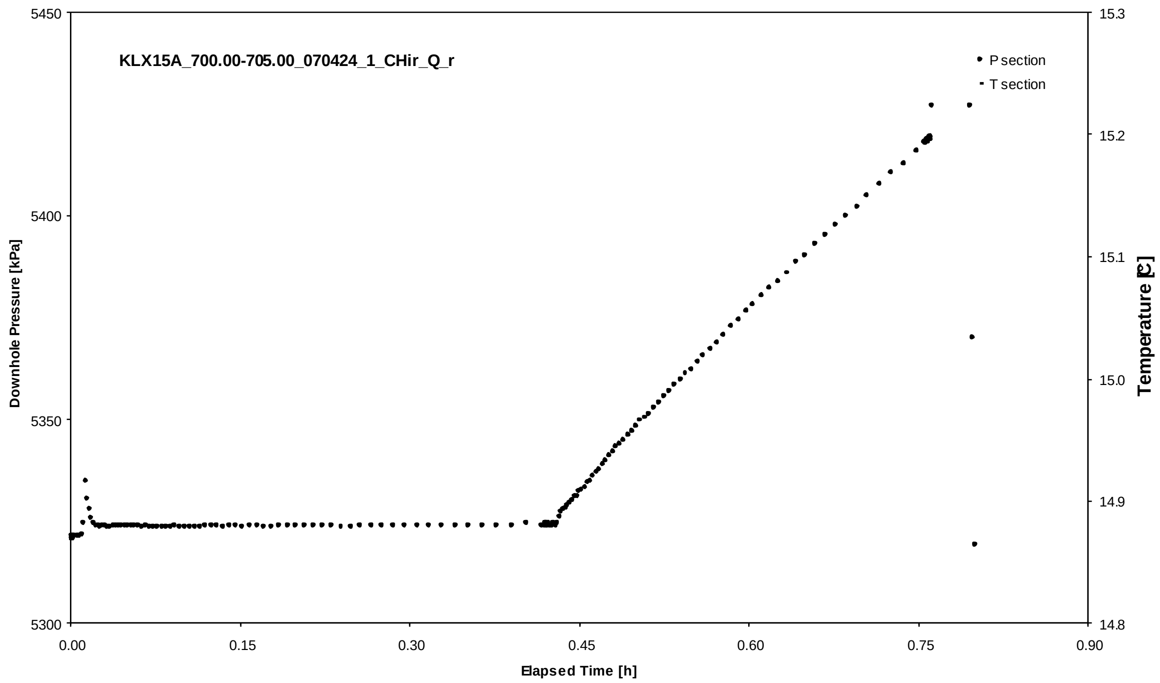
APPENDIX 2-83

Test 700.00 – 705.00 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

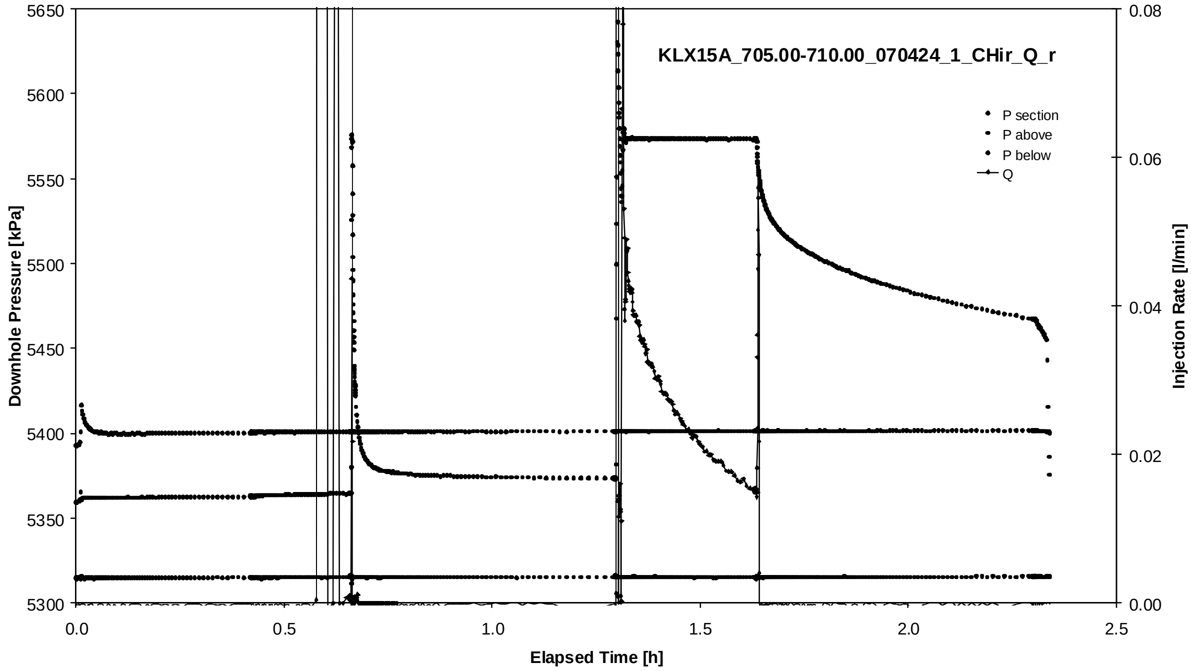
Not analysed

CHIR phase; HORNER match

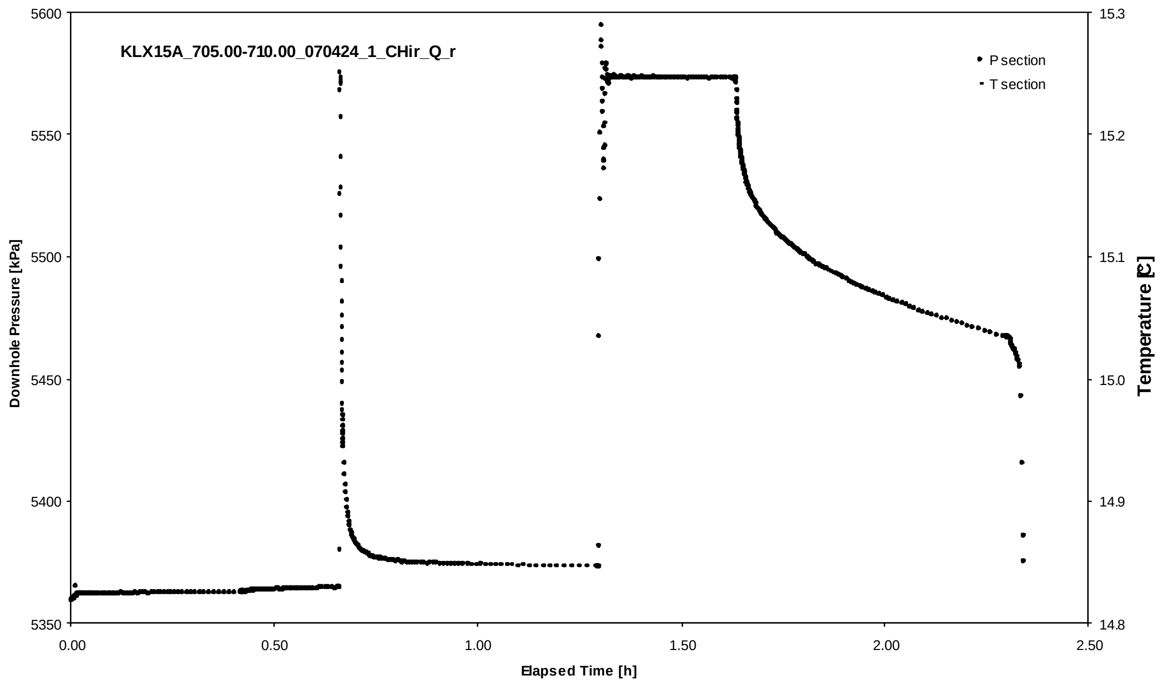
APPENDIX 2-84

Test 705.00 – 710.00 m

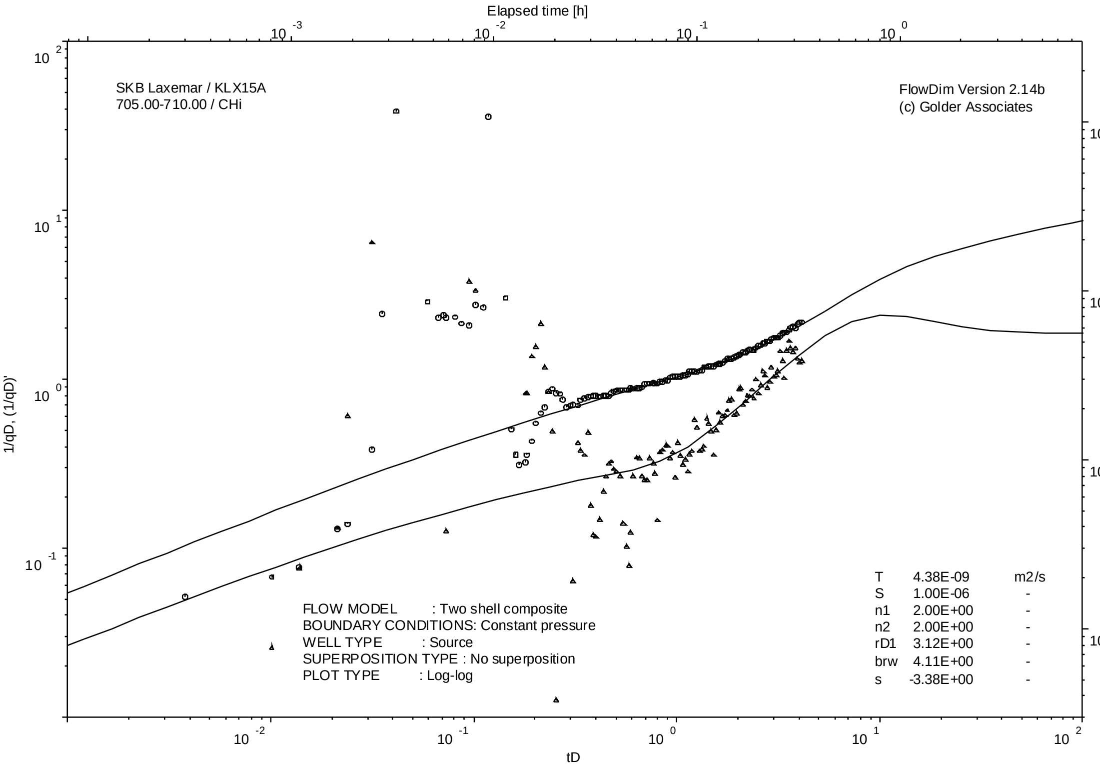
Analysis diagrams



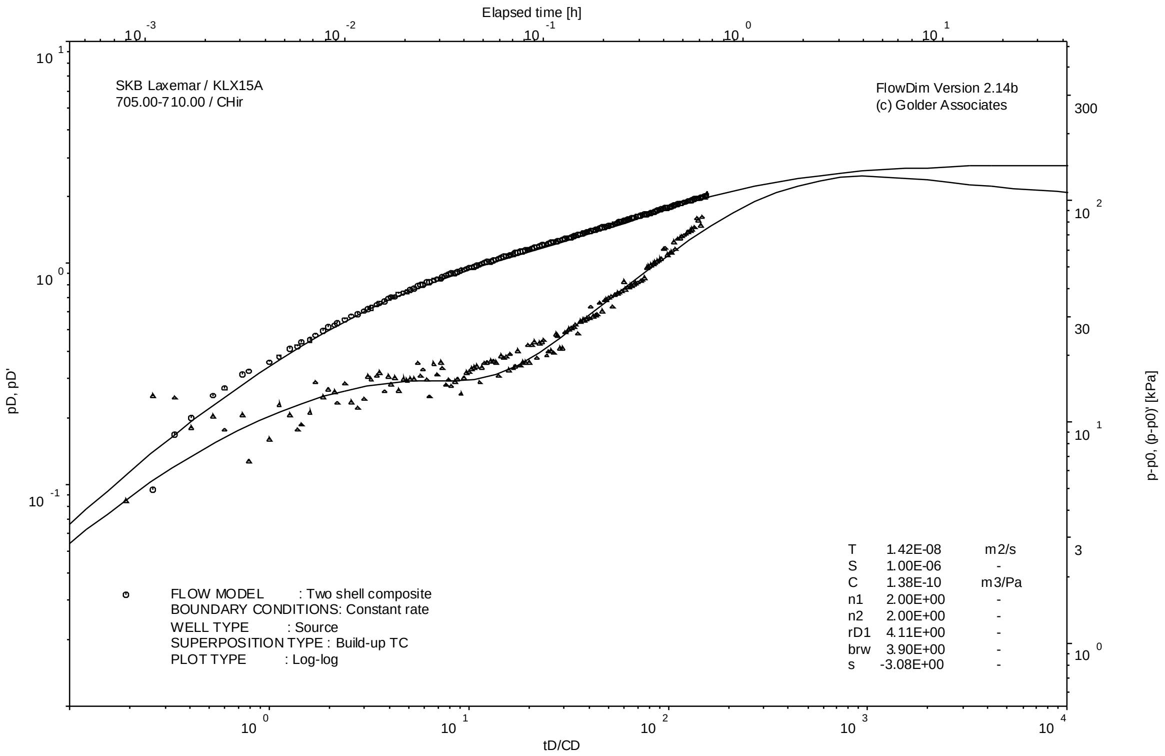
Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

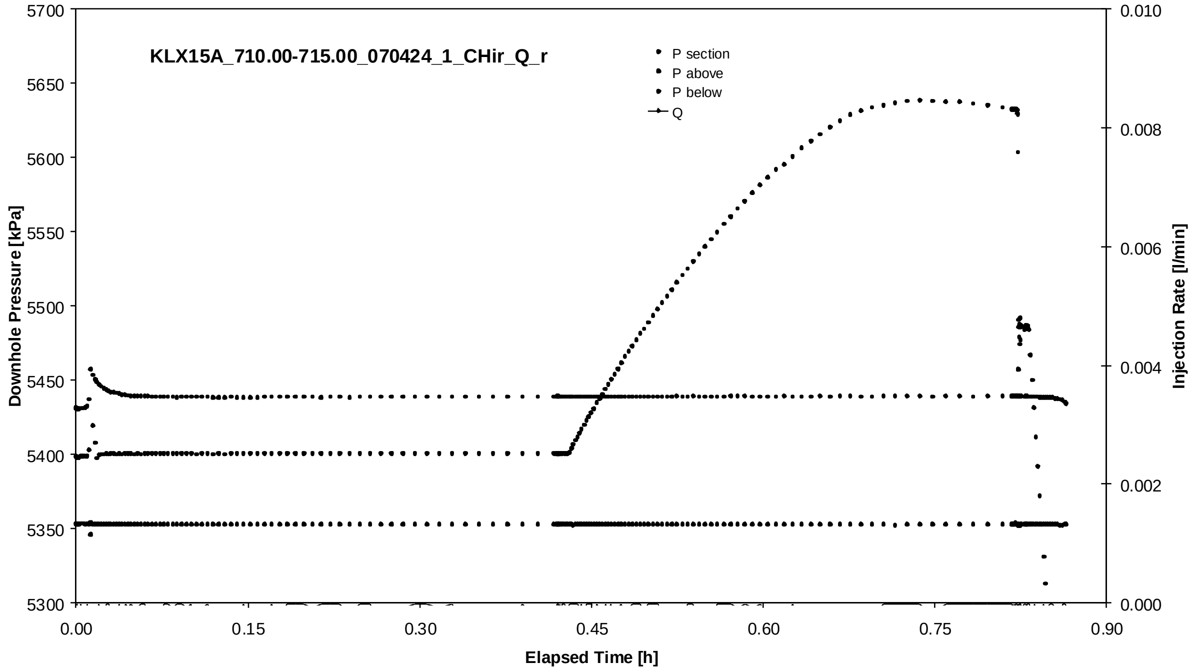
Not analysable

CHIR phase; HORNER match

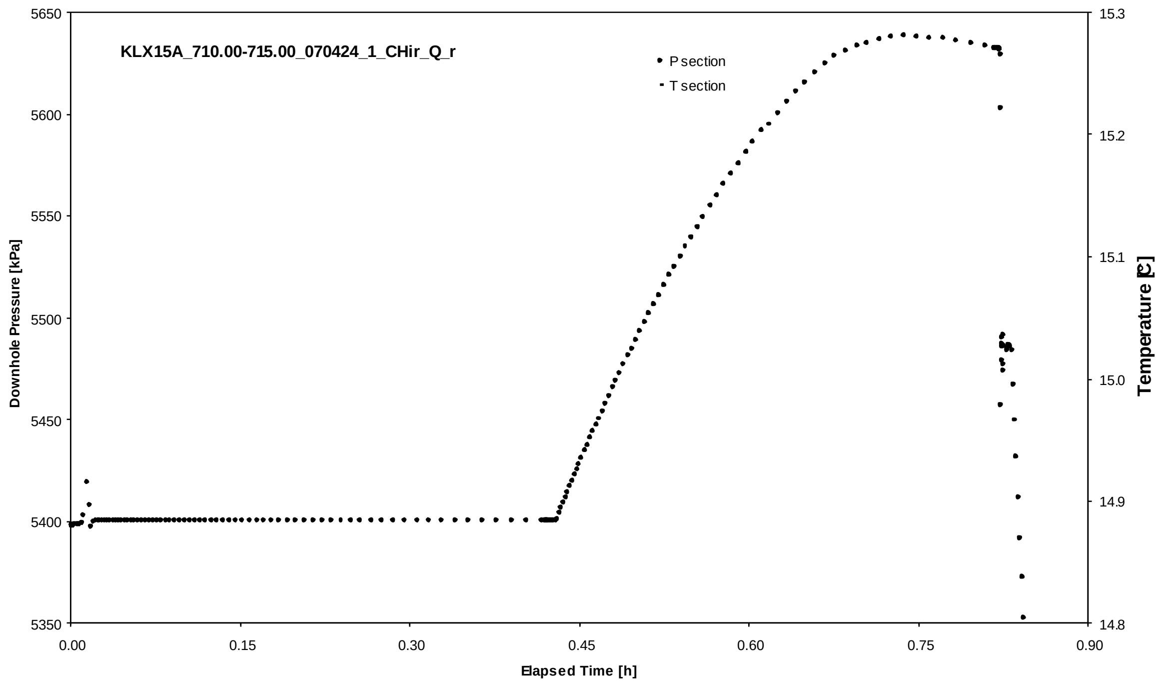
APPENDIX 2-85

Test 710.00 – 715.00 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

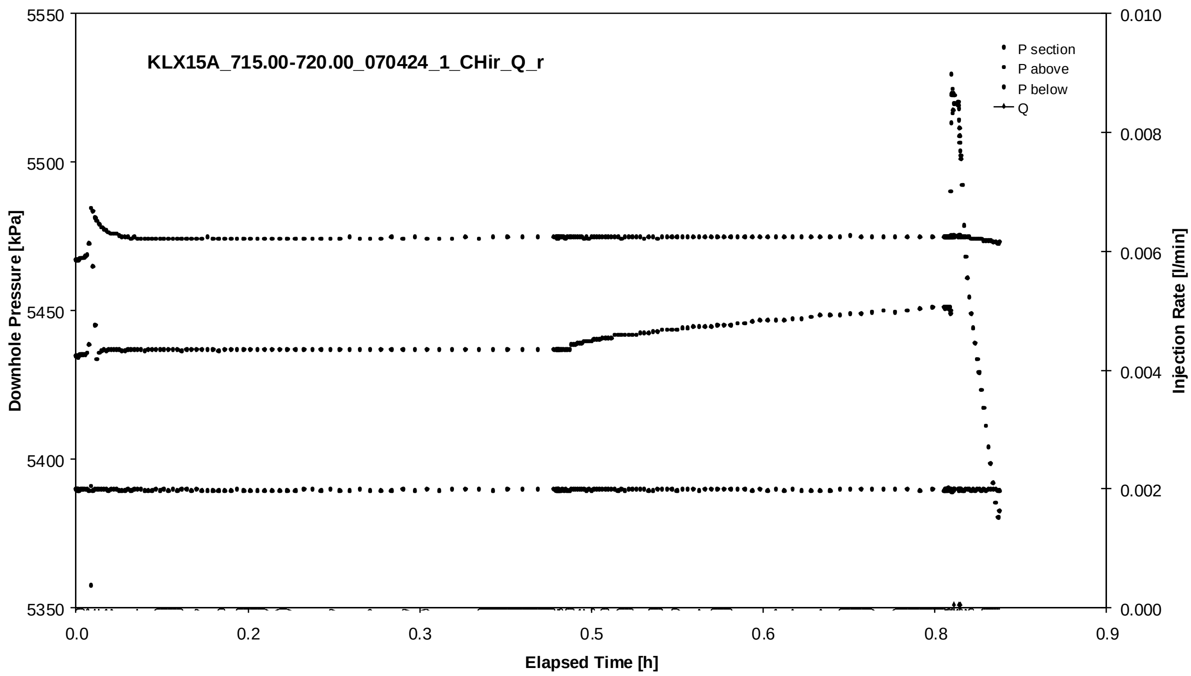
Not analysed

CHIR phase; HORNER match

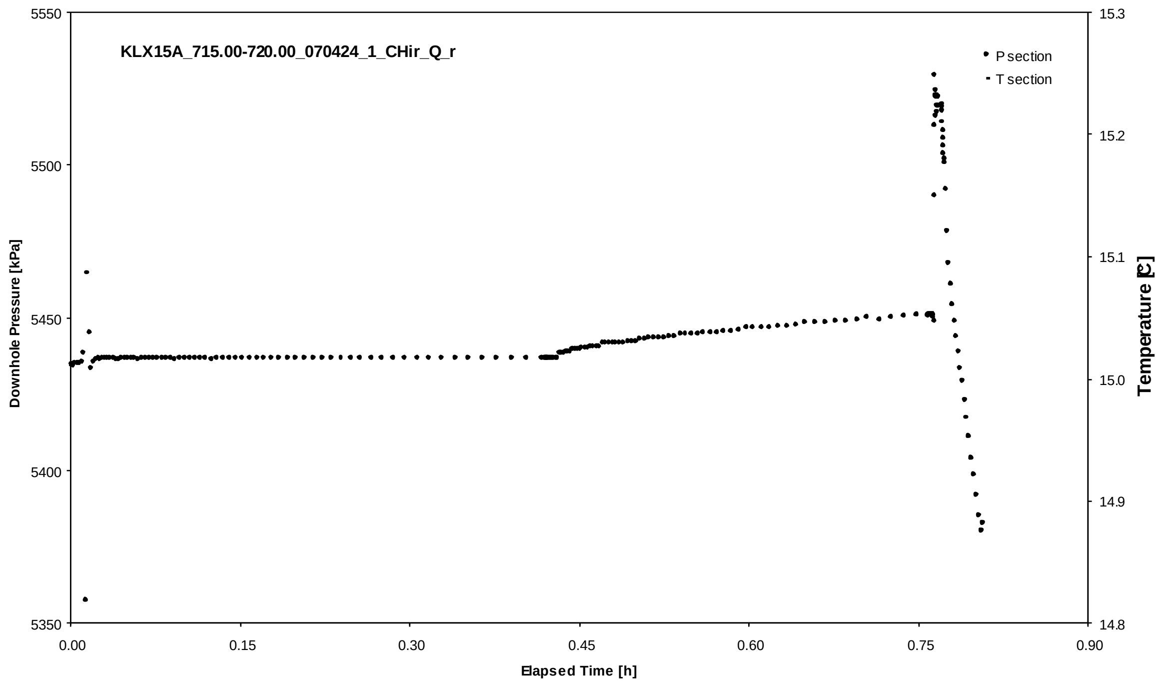
APPENDIX 2-86

Test 715.00 – 720.00 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

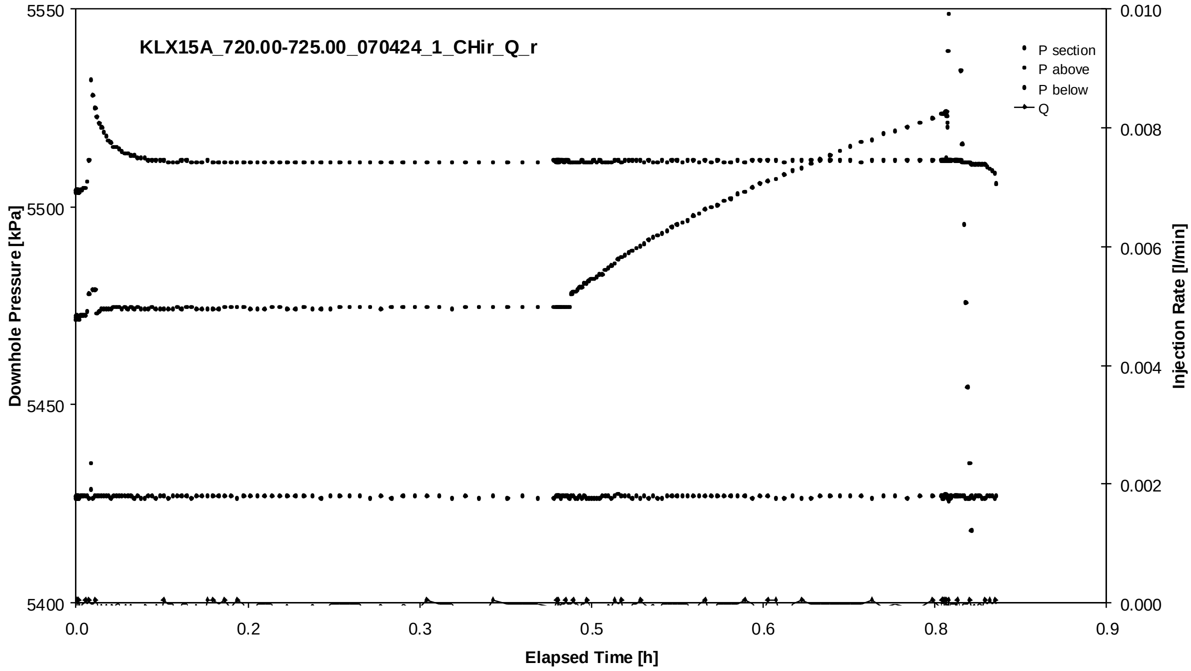
Not analysed

CHIR phase; HORNER match

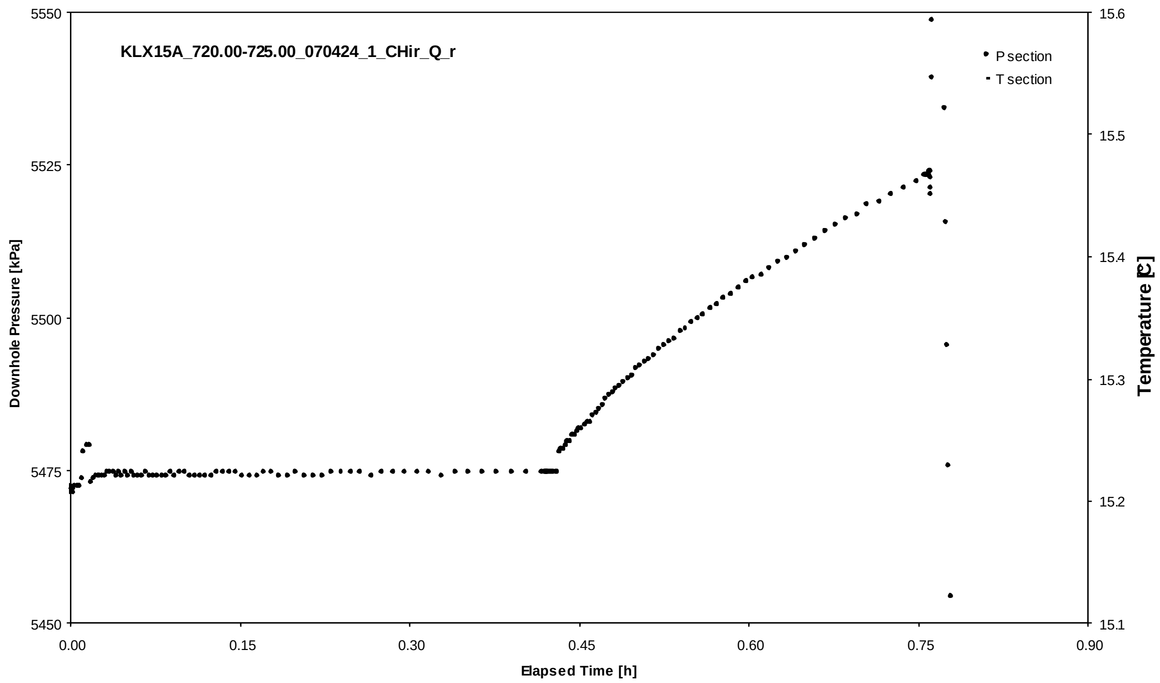
APPENDIX 2-87

Test 720.00 – 725.00 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

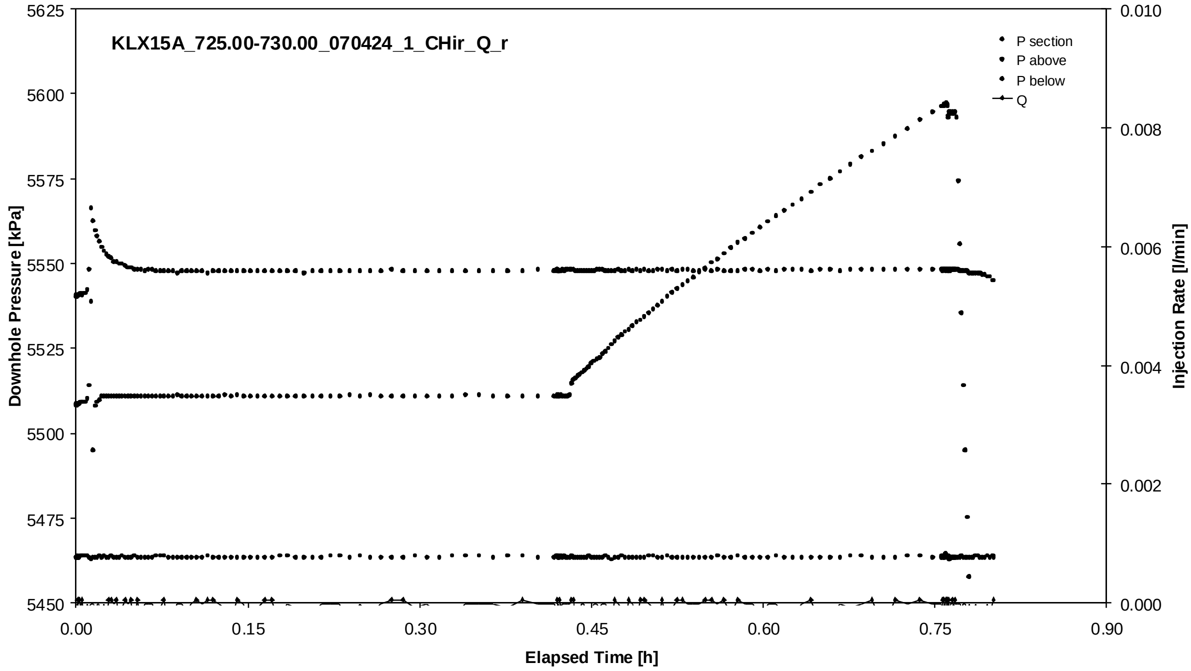
Not analysed

CHIR phase; HORNER match

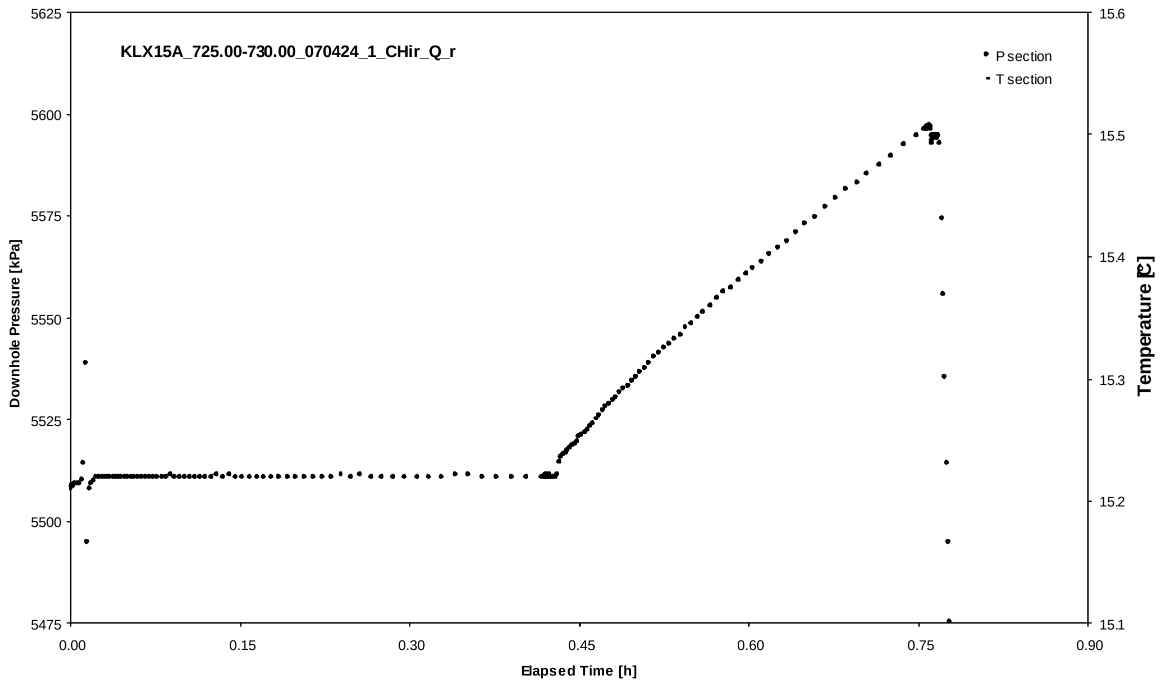
APPENDIX 2-88

Test 725.00 – 730.00 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

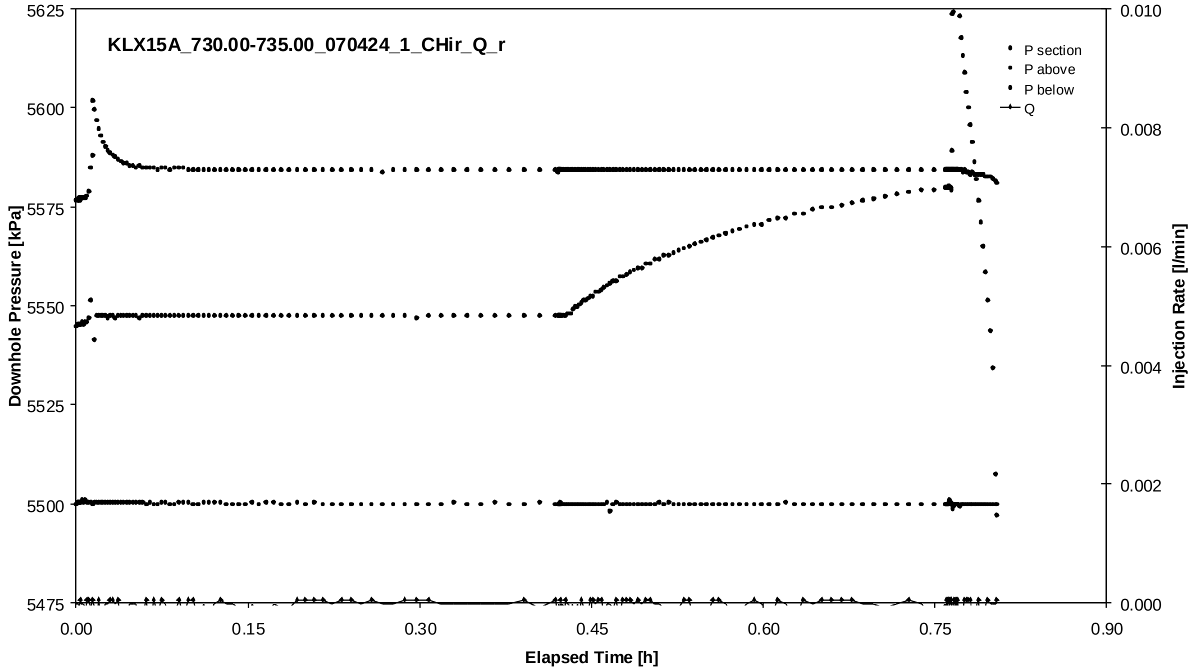
Not analysed

CHIR phase; HORNER match

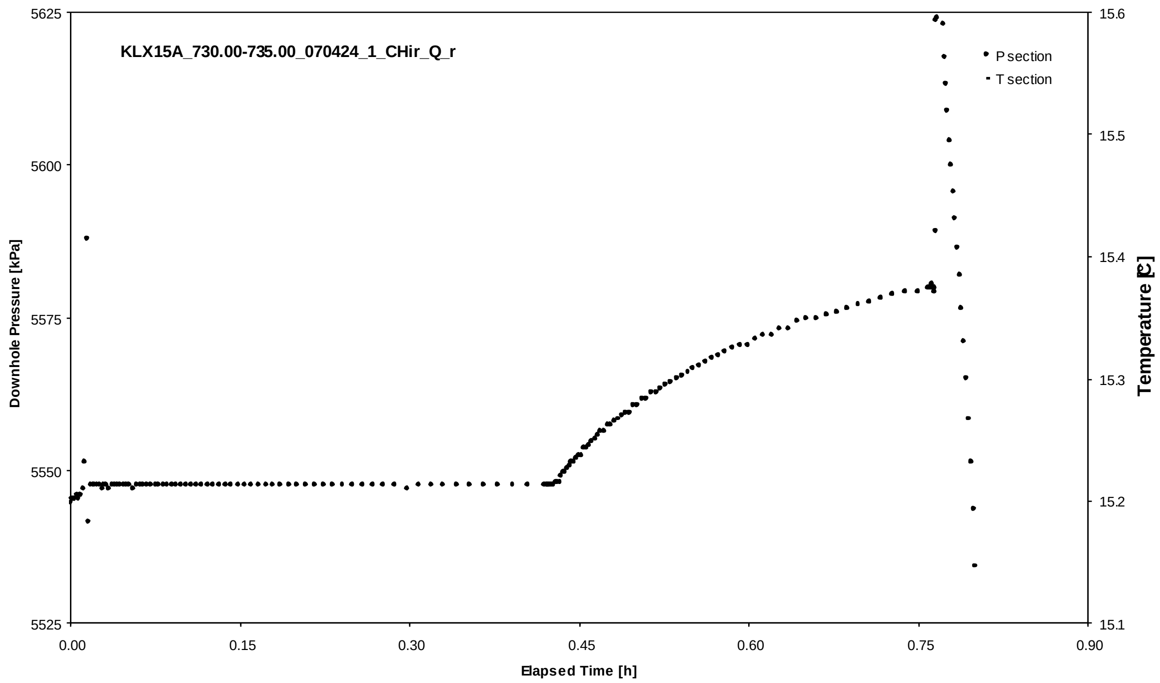
APPENDIX 2-89

Test 730.00 – 735.00 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

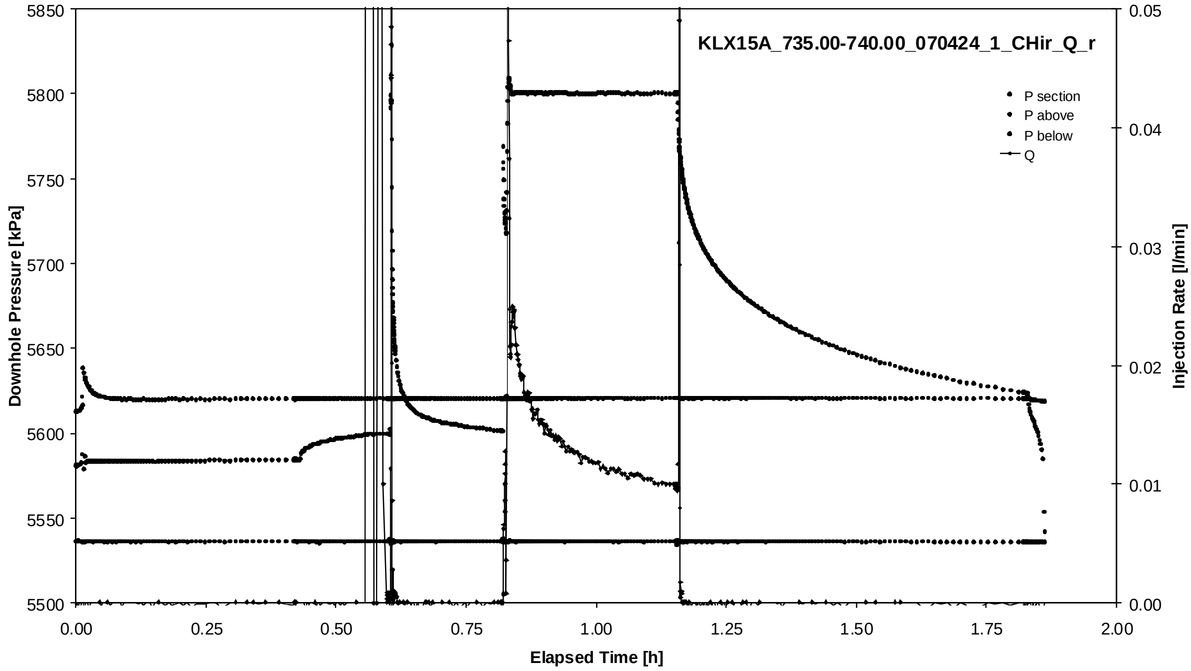
Not analysed

CHIR phase; HORNER match

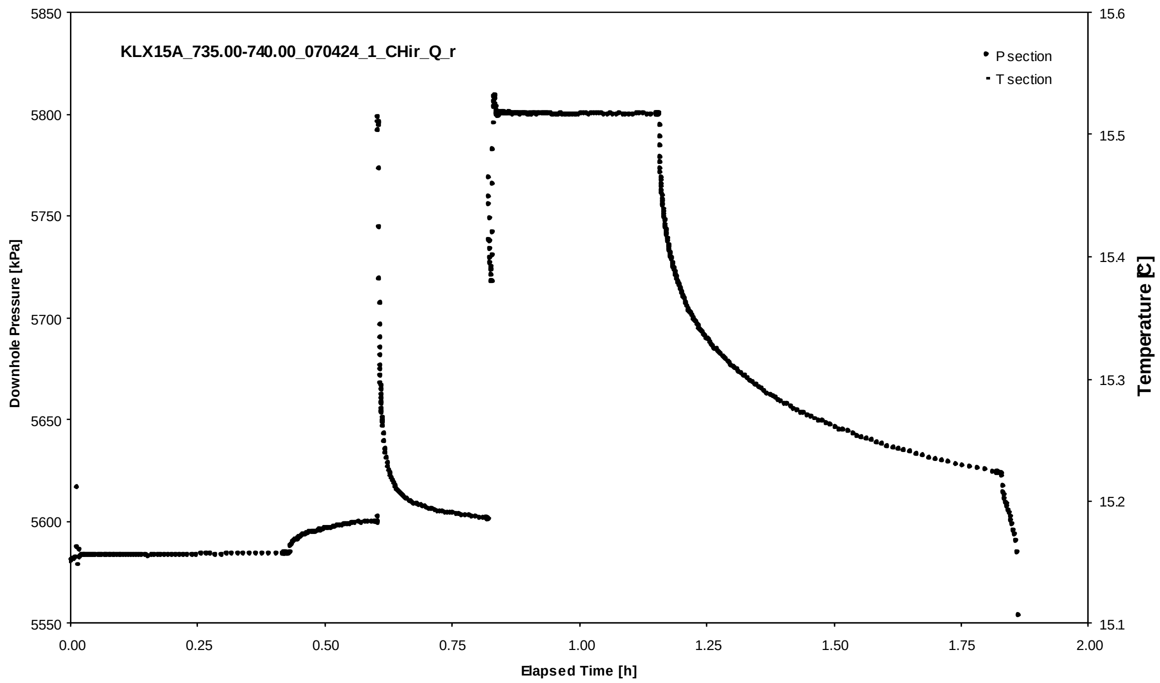
APPENDIX 2-90

Test 735.00 – 740.00 m

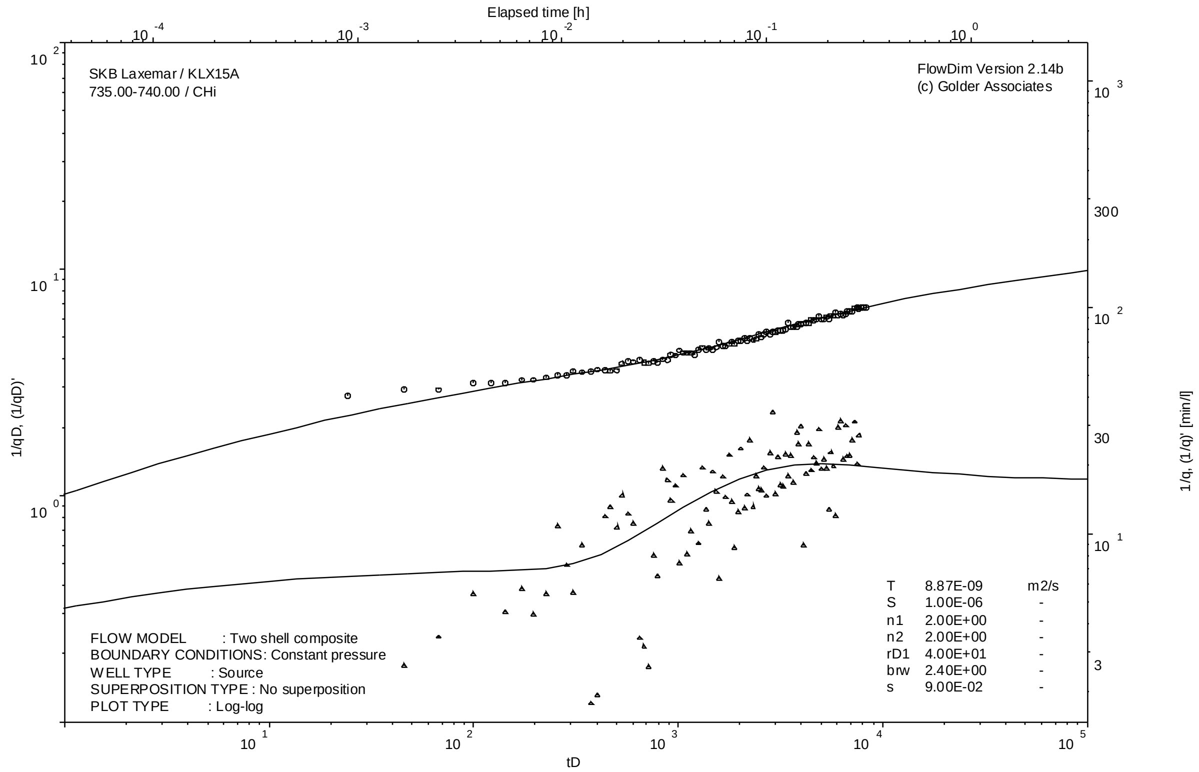
Analysis diagrams



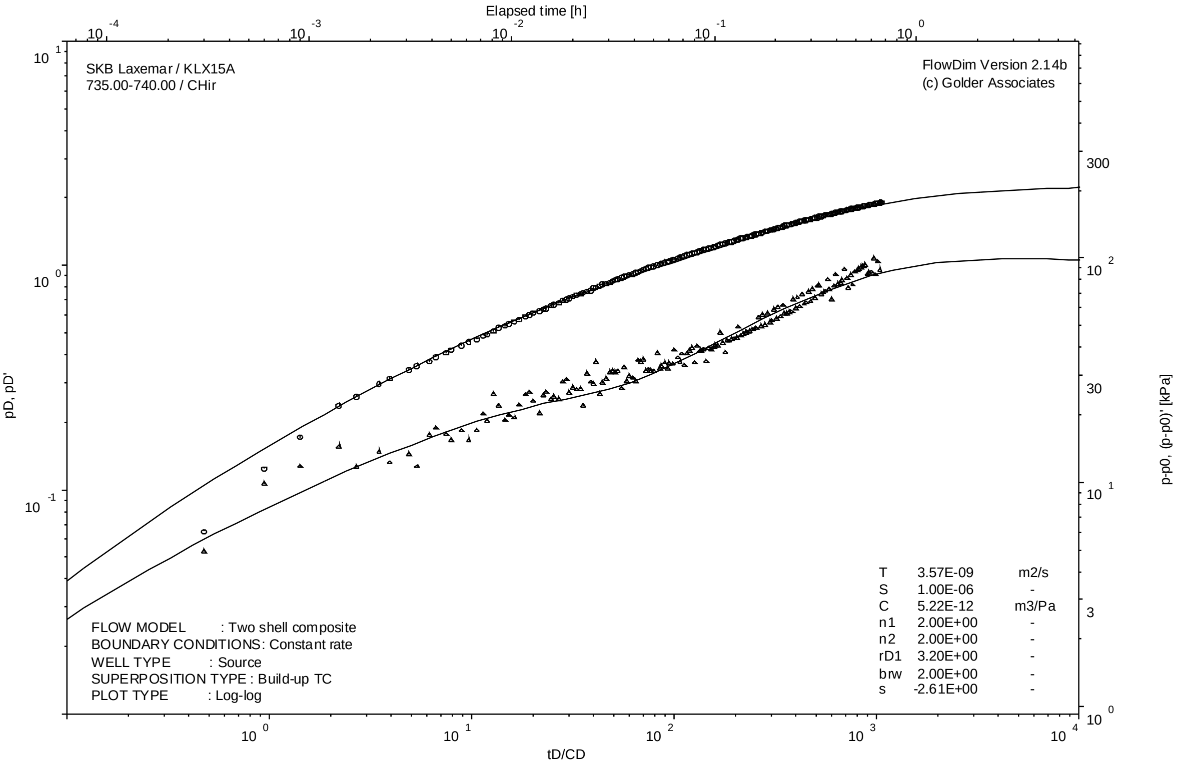
Pressure and flow rate vs. time; cartesian plot



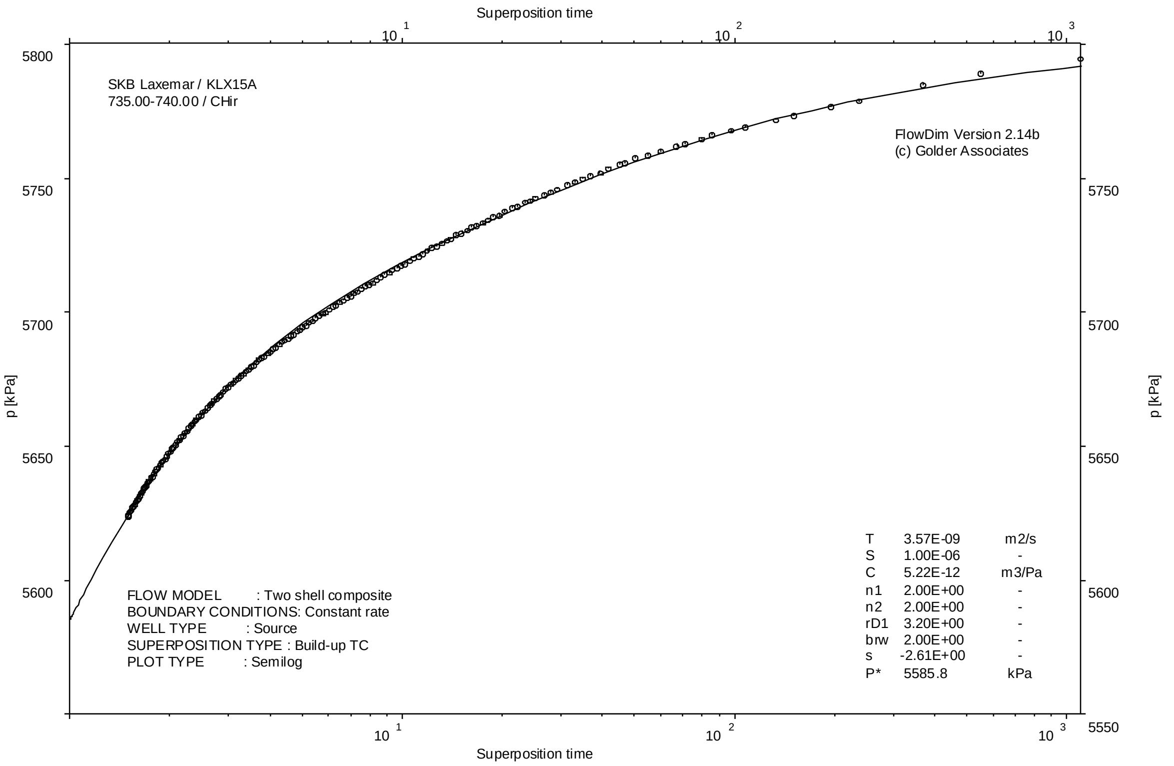
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

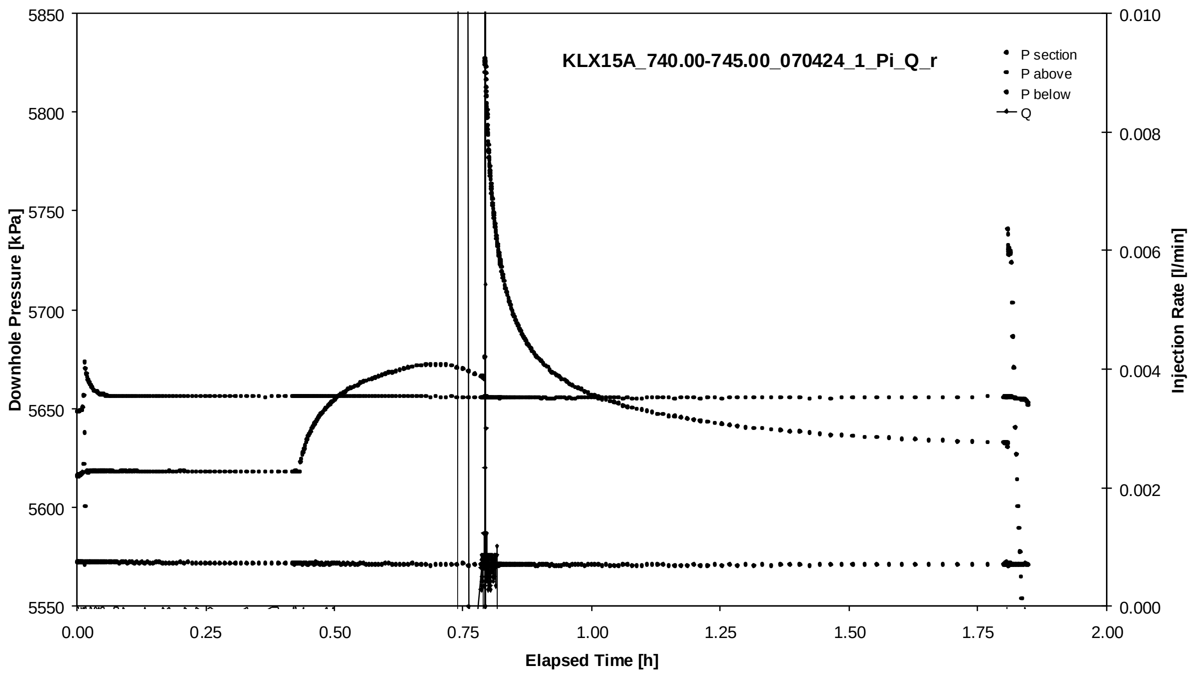


CHIR phase; HORNER match

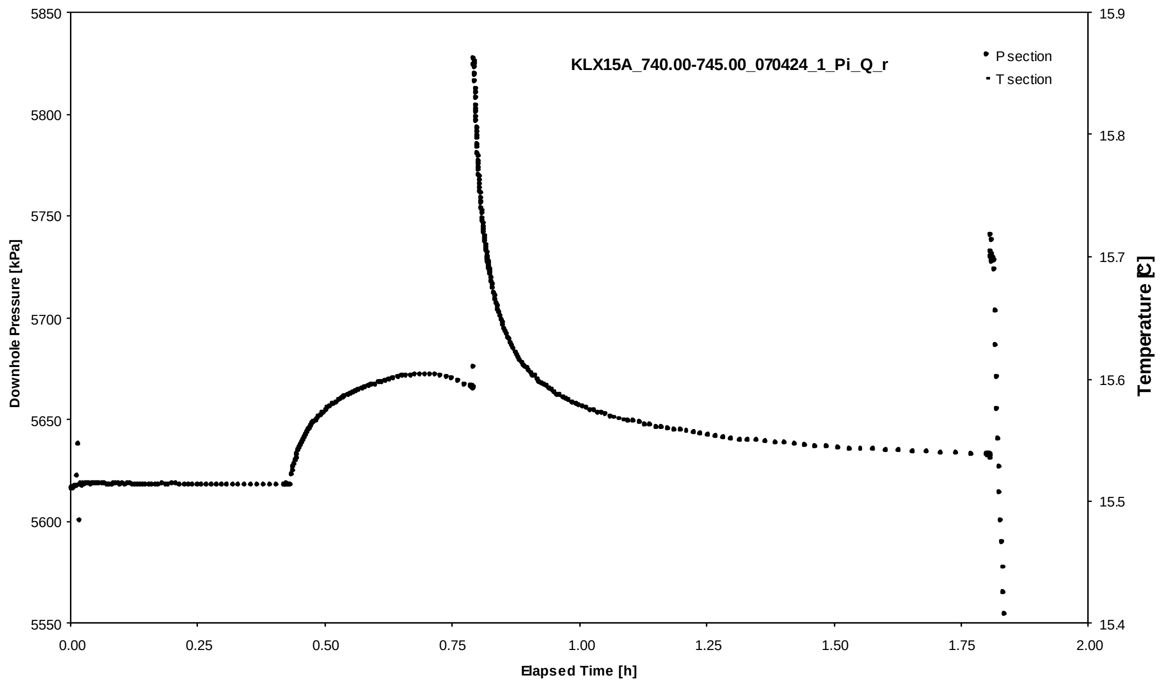
APPENDIX 2-91

Test 740.00 – 745.00 m

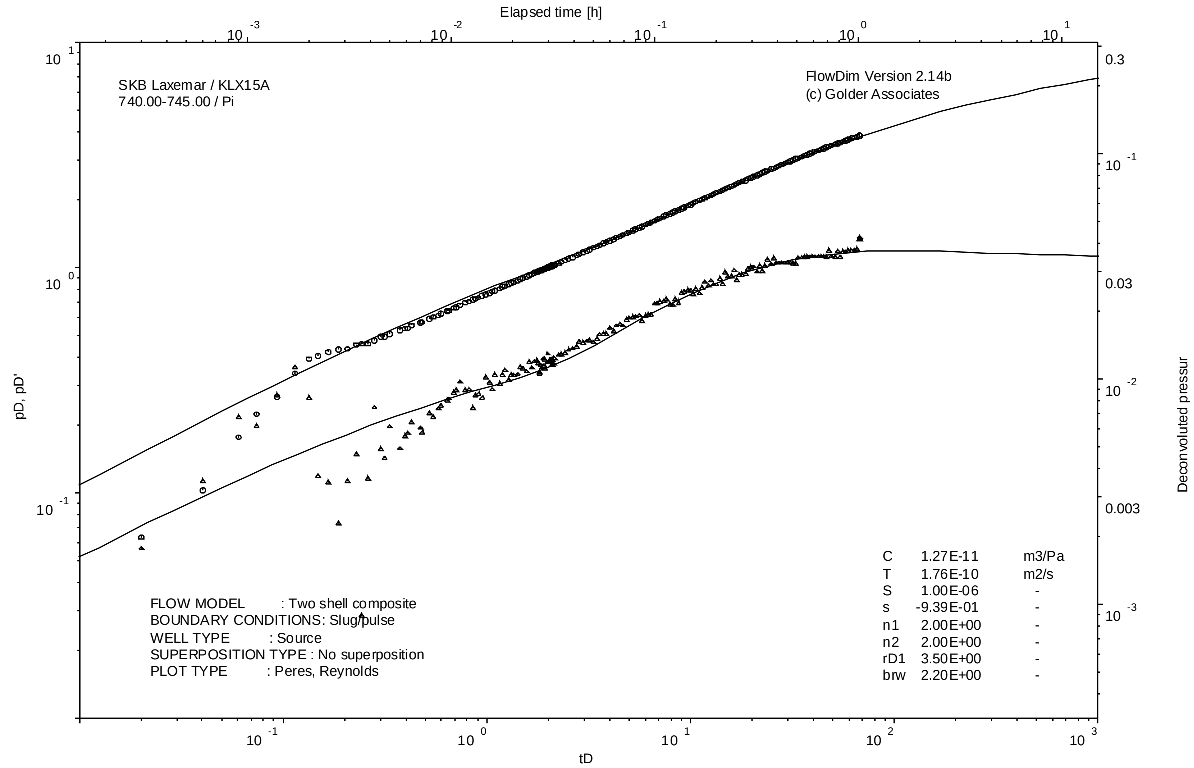
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

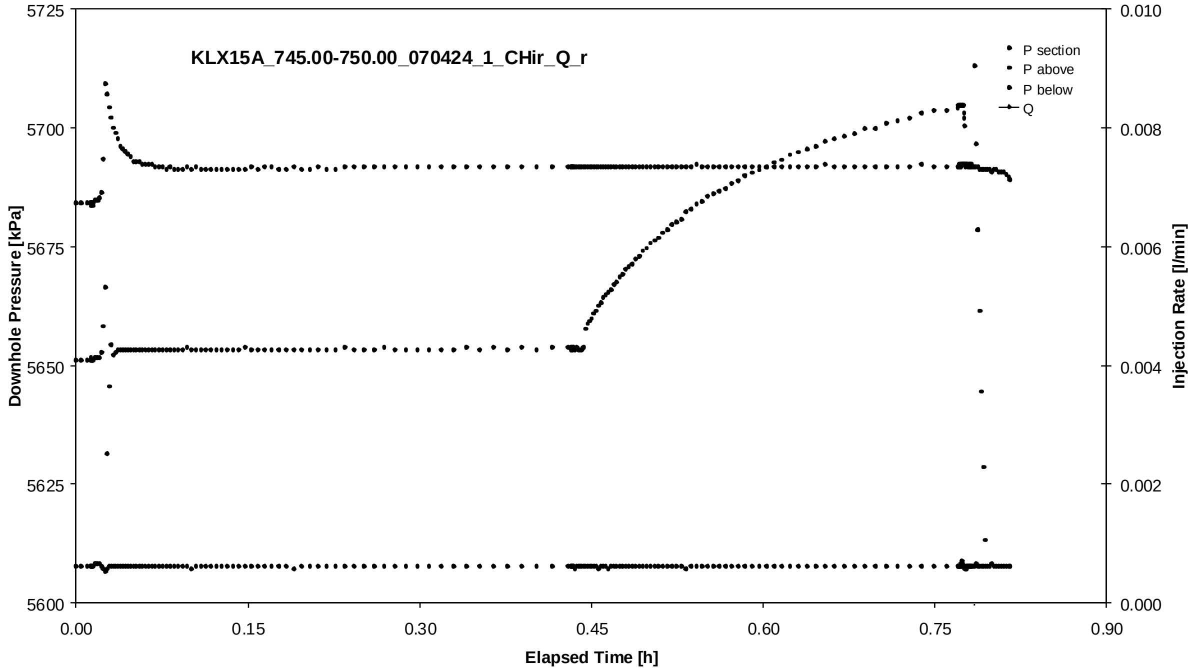


Pulse injection; deconvolution match

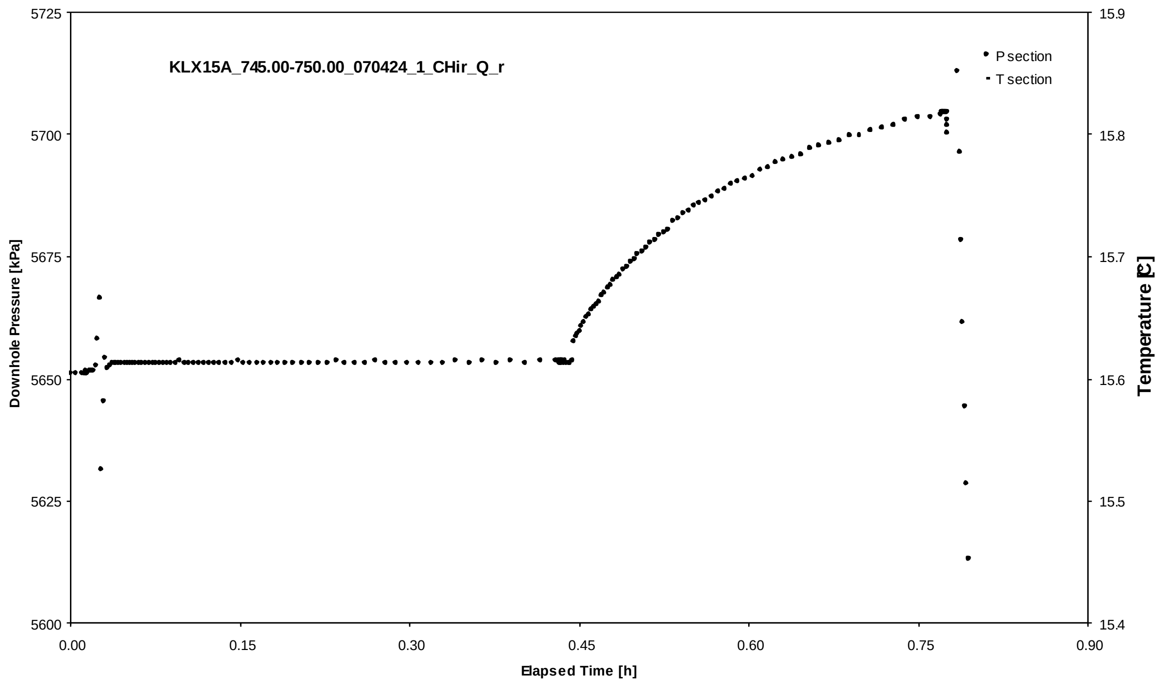
APPENDIX 2-92

Test 745.00 – 750.00 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

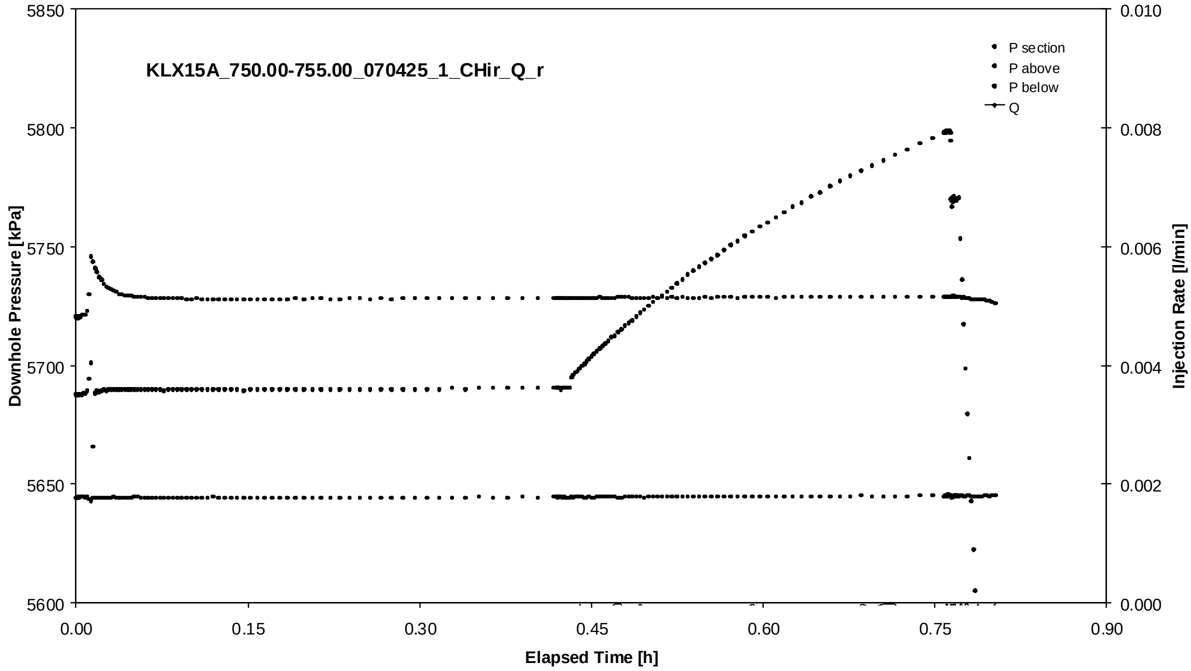
Not analysed

CHIR phase; HORNER match

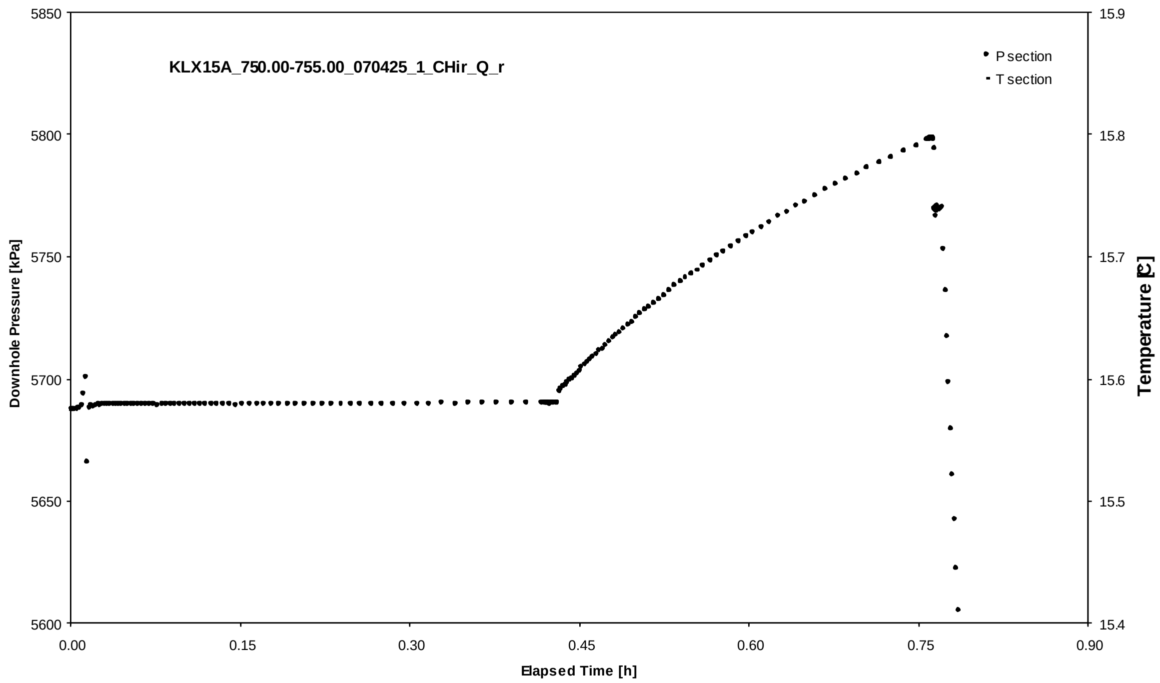
APPENDIX 2-93

Test 750.00 – 755.00 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

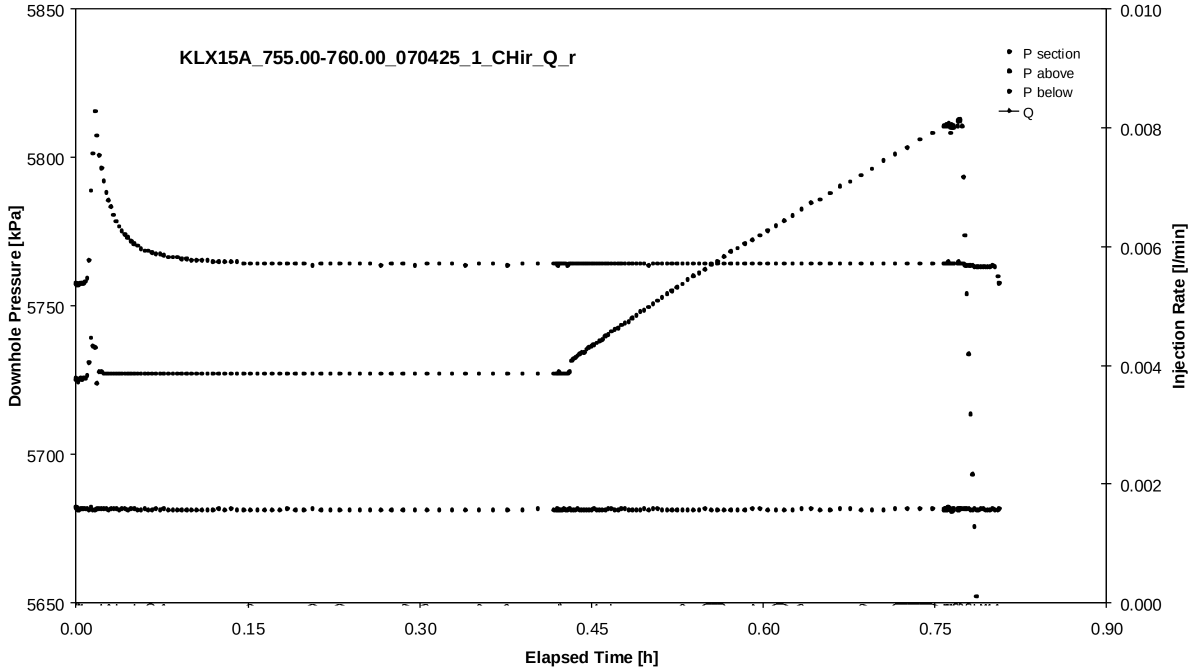
Not analysed

CHIR phase; HORNER match

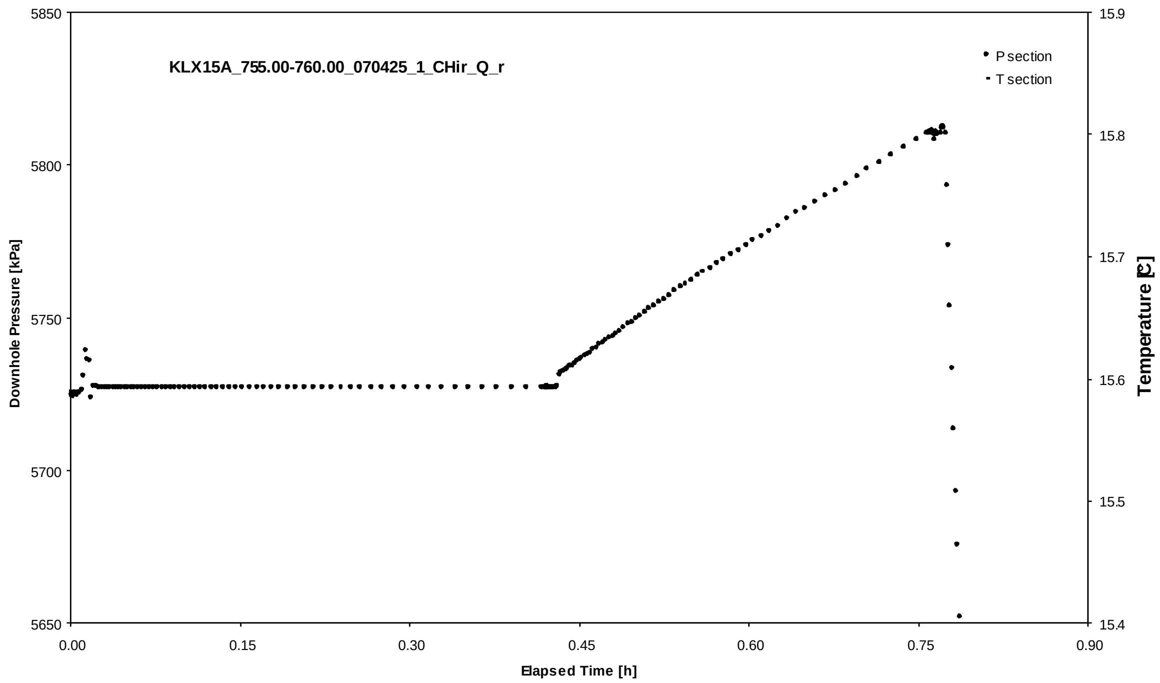
APPENDIX 2-94

Test 755.00 – 760.00 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

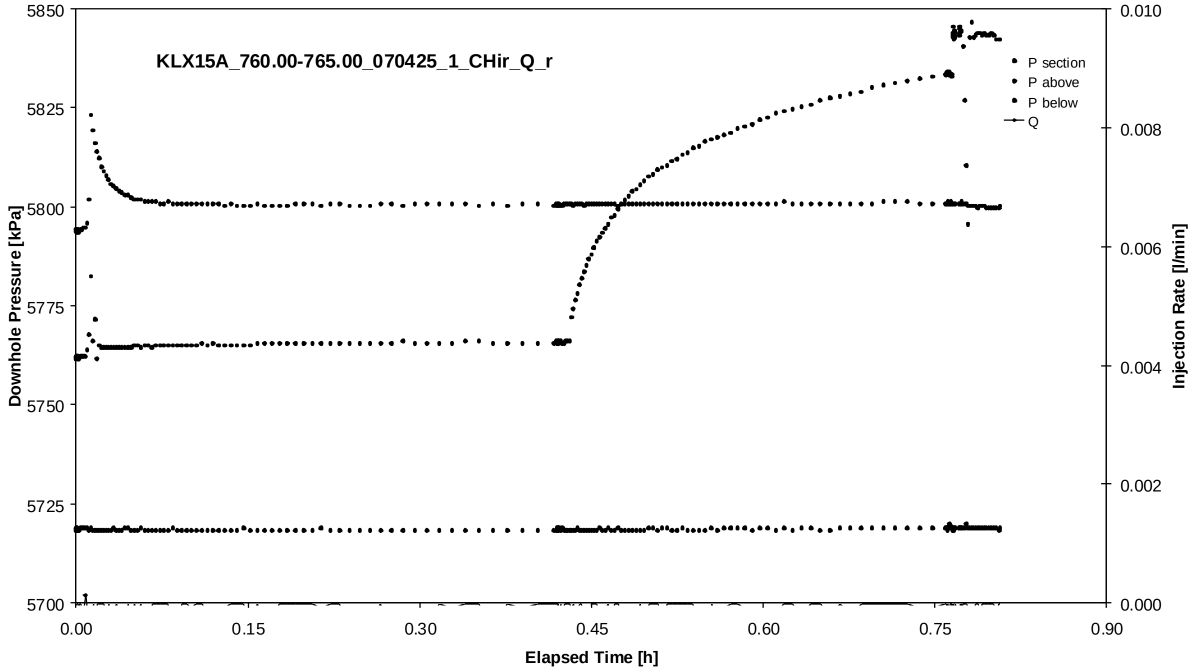
Not analysed

CHIR phase; HORNER match

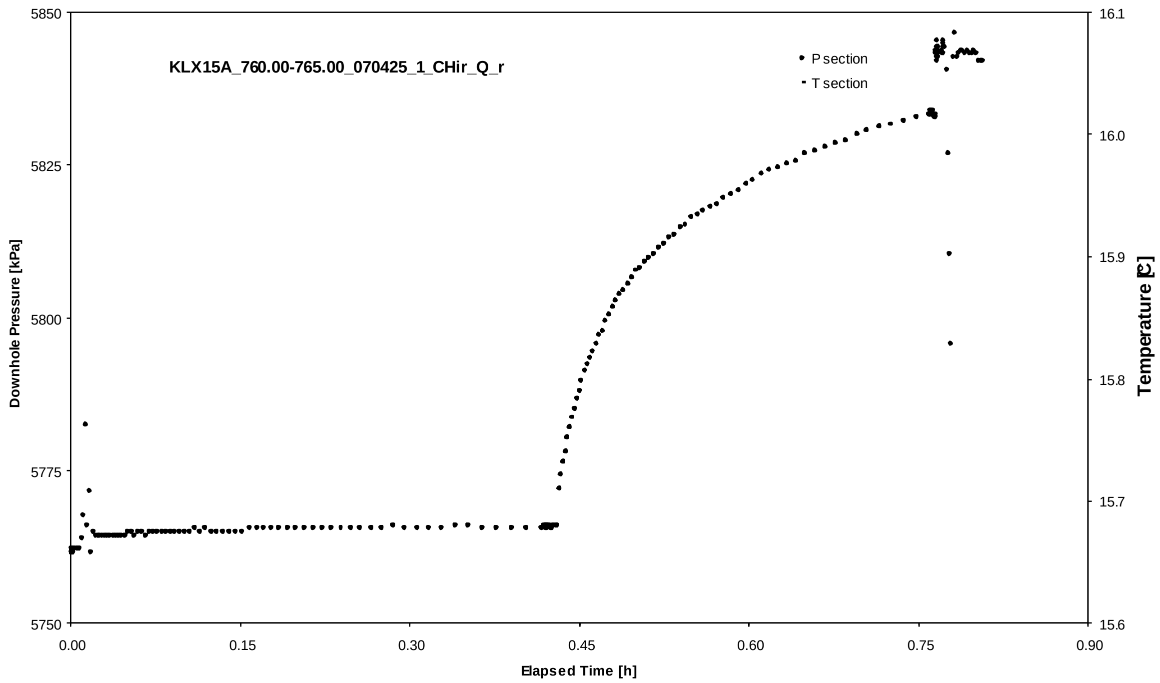
APPENDIX 2-95

Test 760.00 – 765.00 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

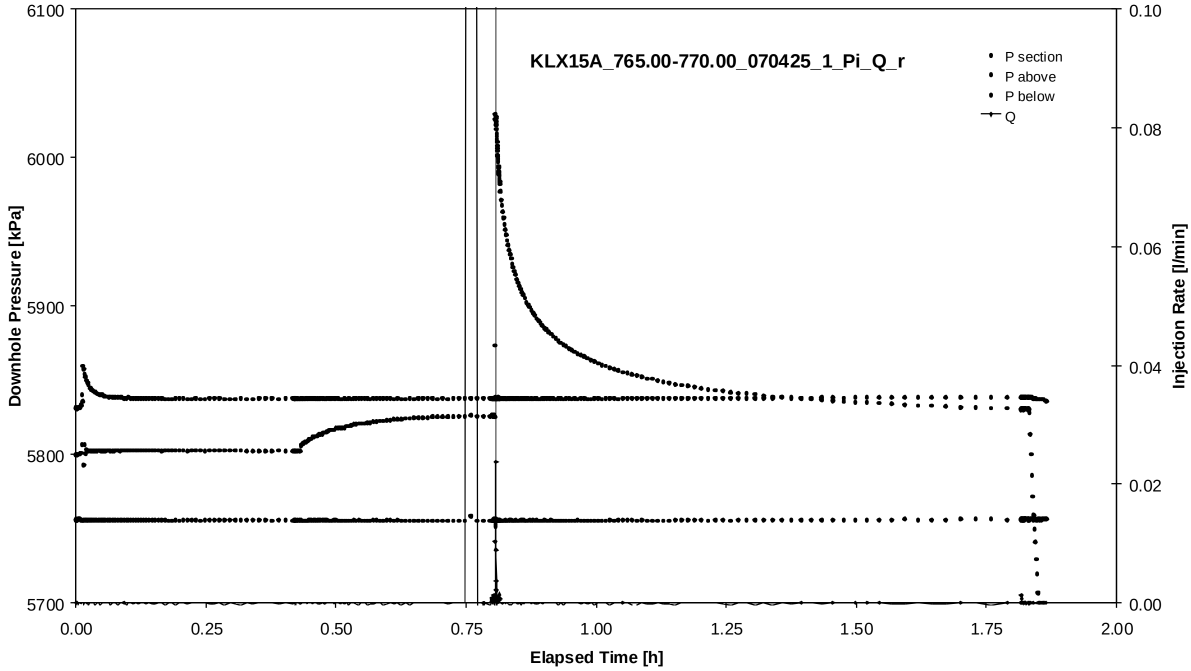
Not analysed

CHIR phase; HORNER match

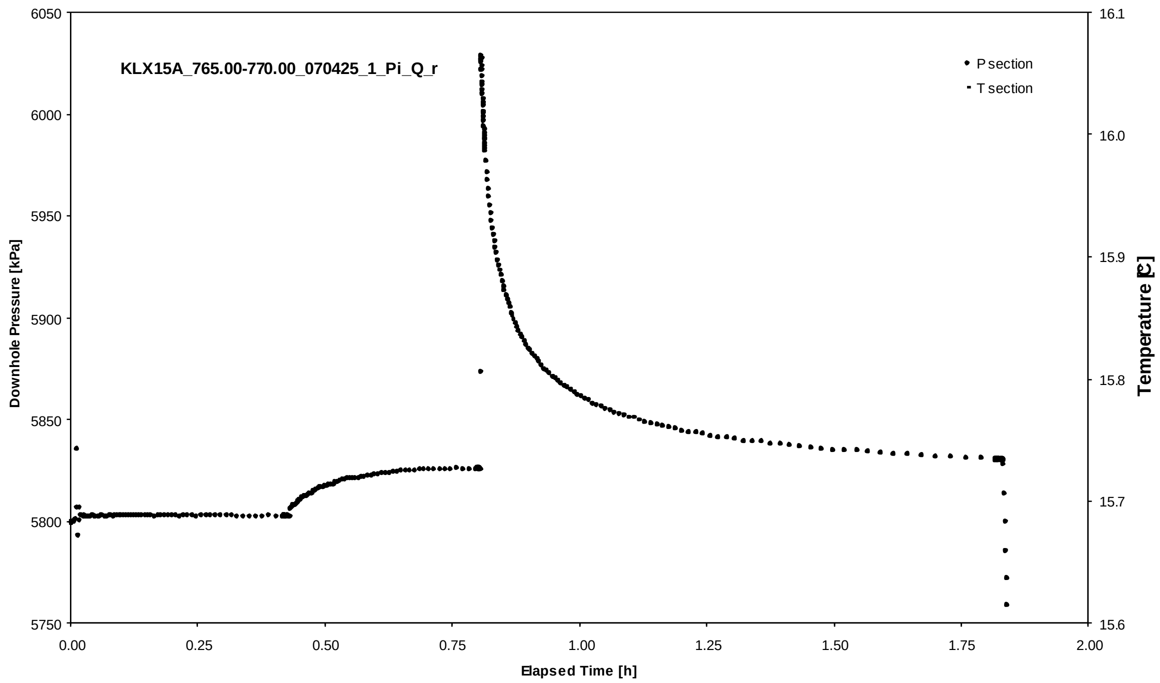
APPENDIX 2-96

Test 765.00 – 770.00 m

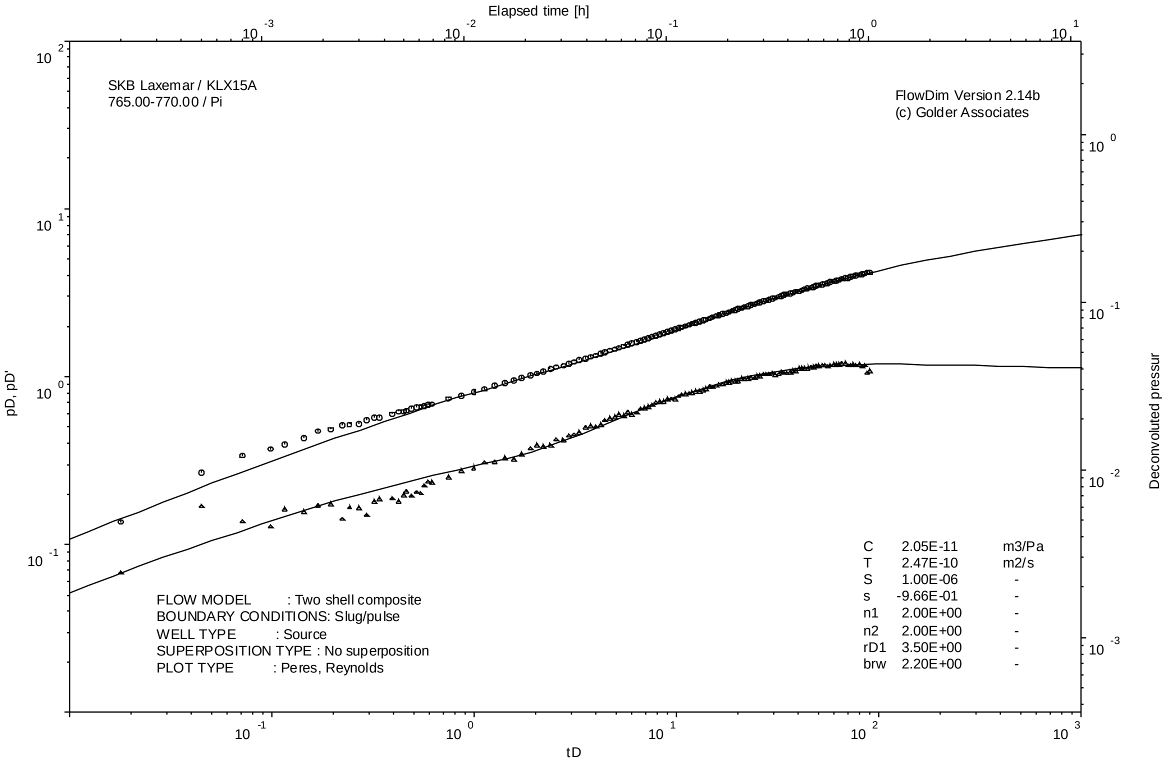
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

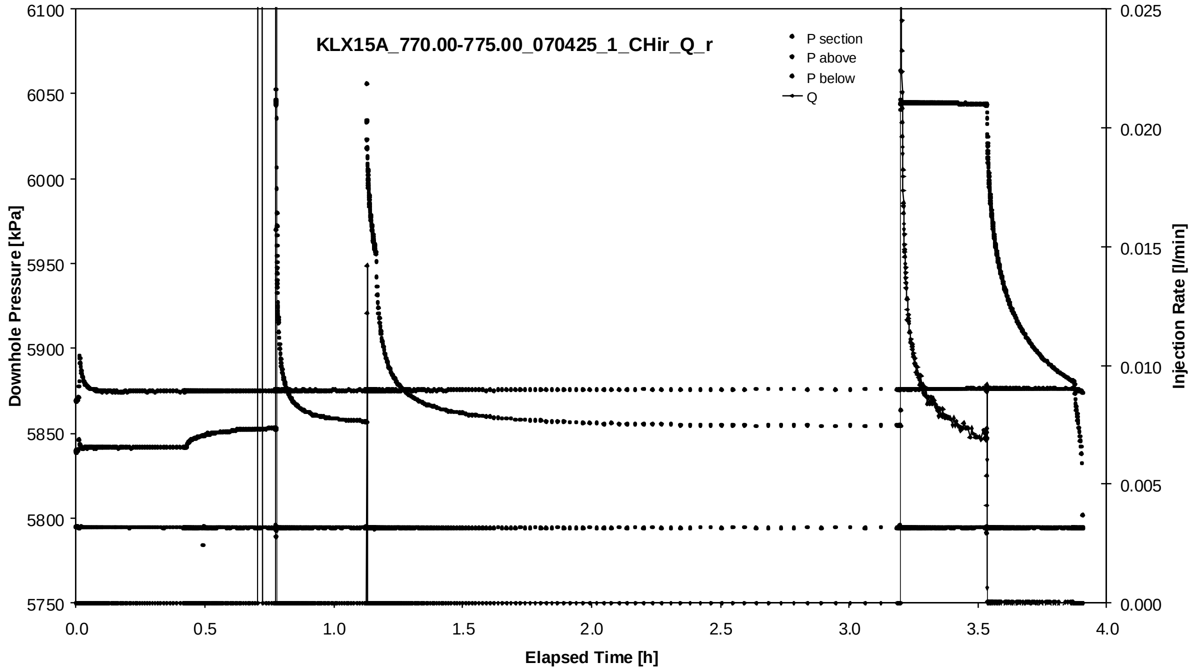


Pulse injection; deconvolution match

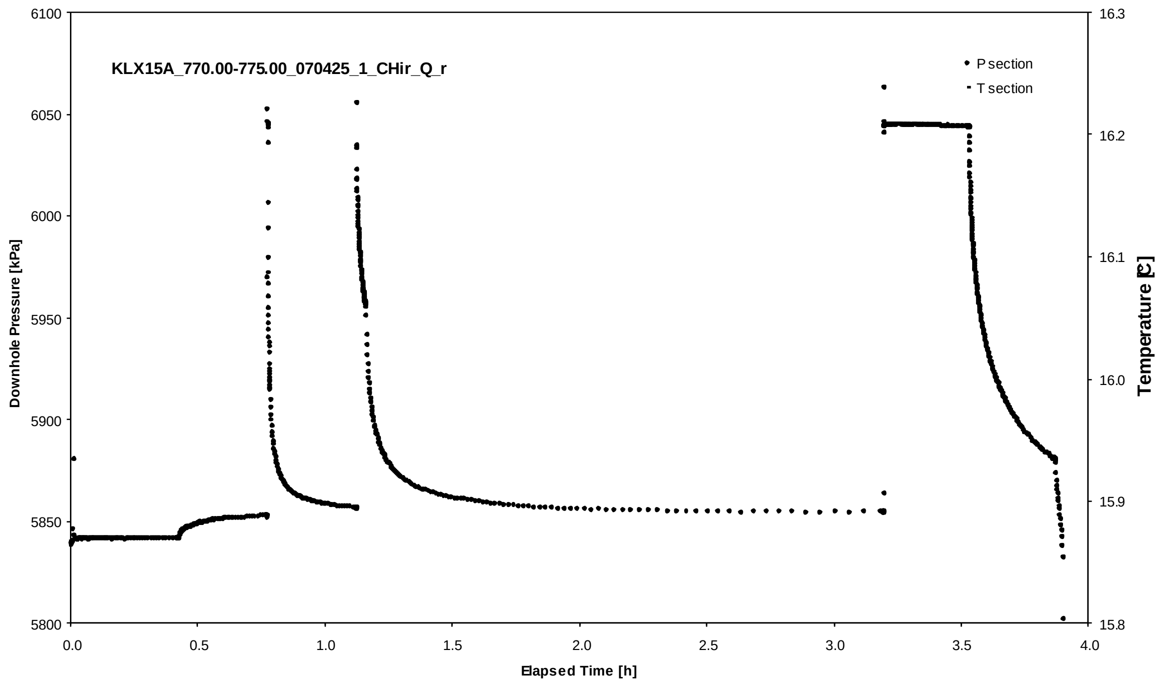
APPENDIX 2-97

Test 770.00 – 775.00 m

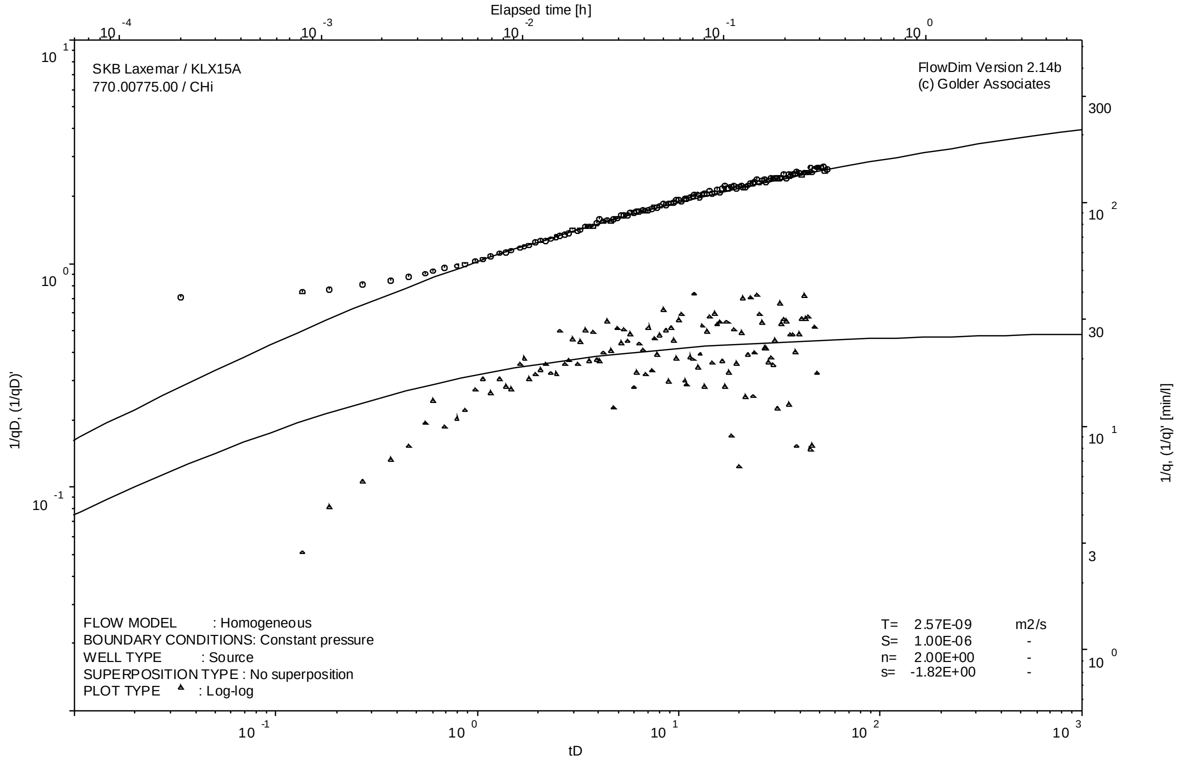
Analysis diagrams



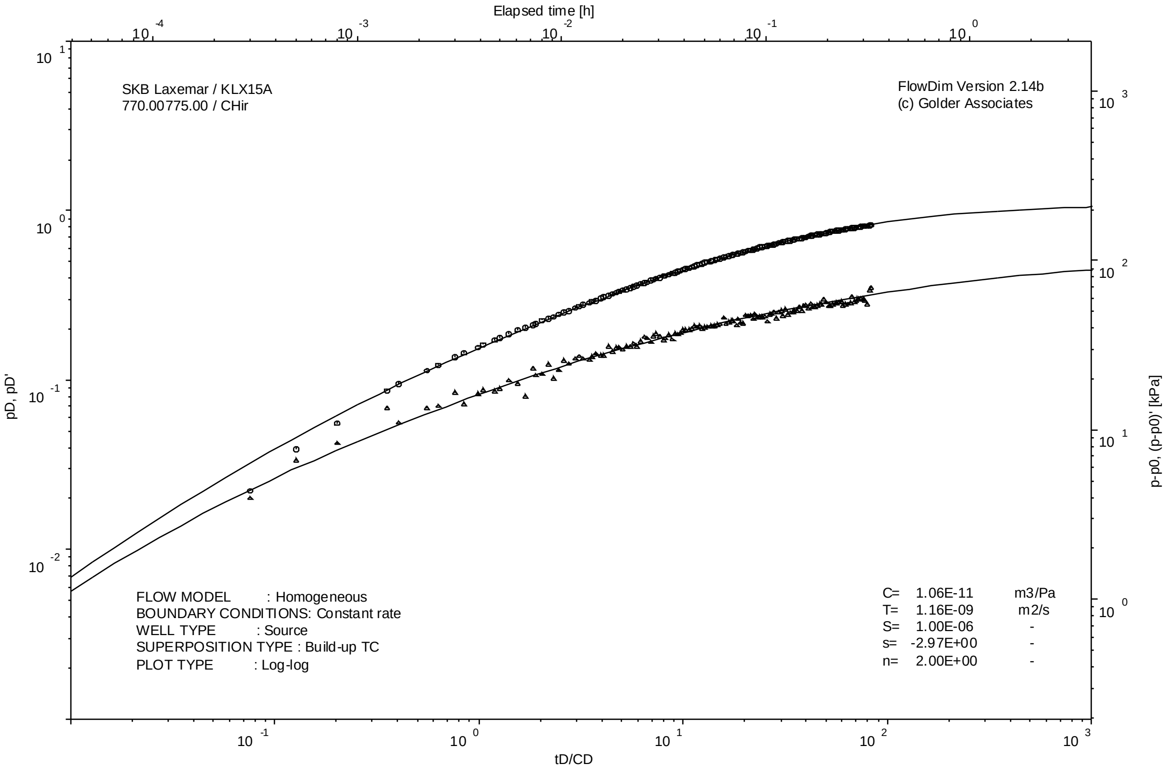
Pressure and flow rate vs. time; cartesian plot



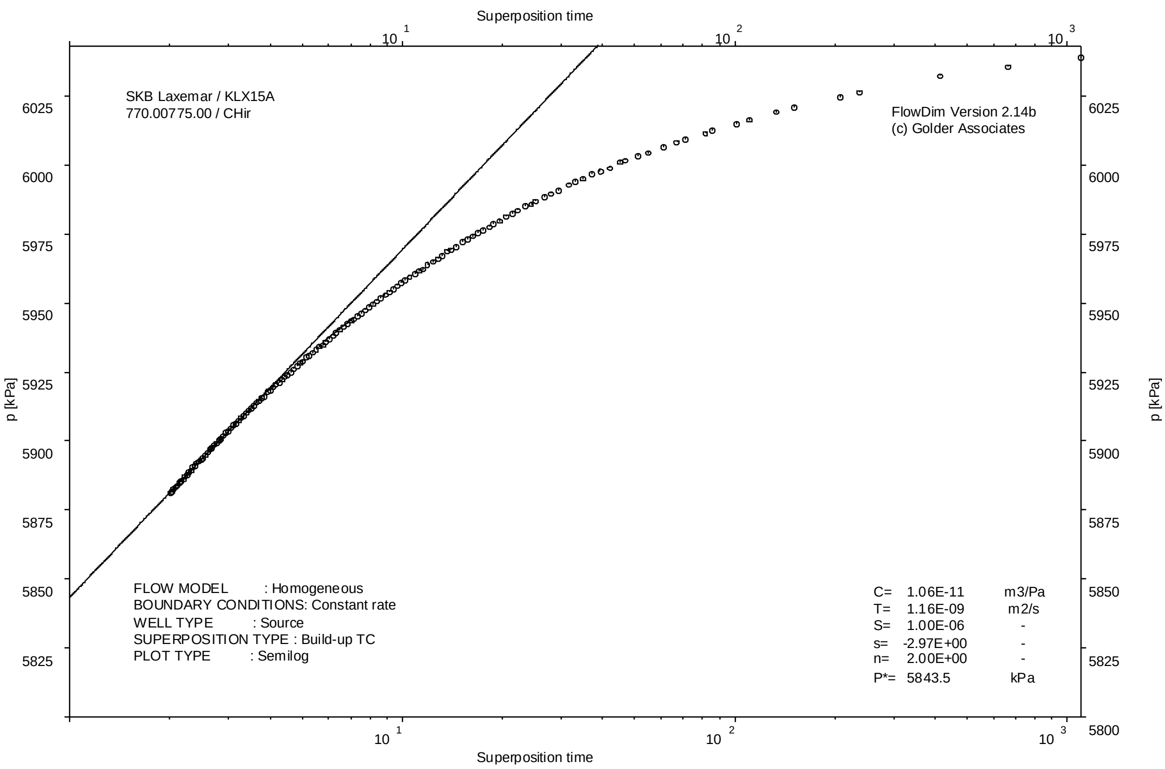
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

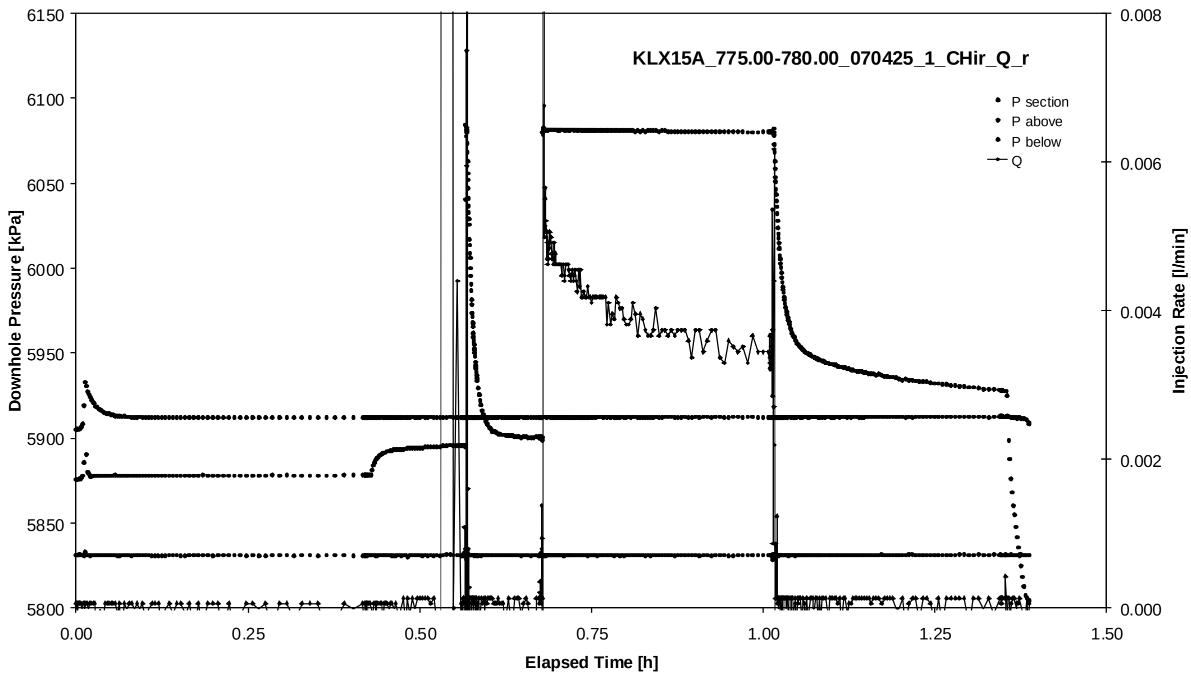


CHIR phase; HORNER match

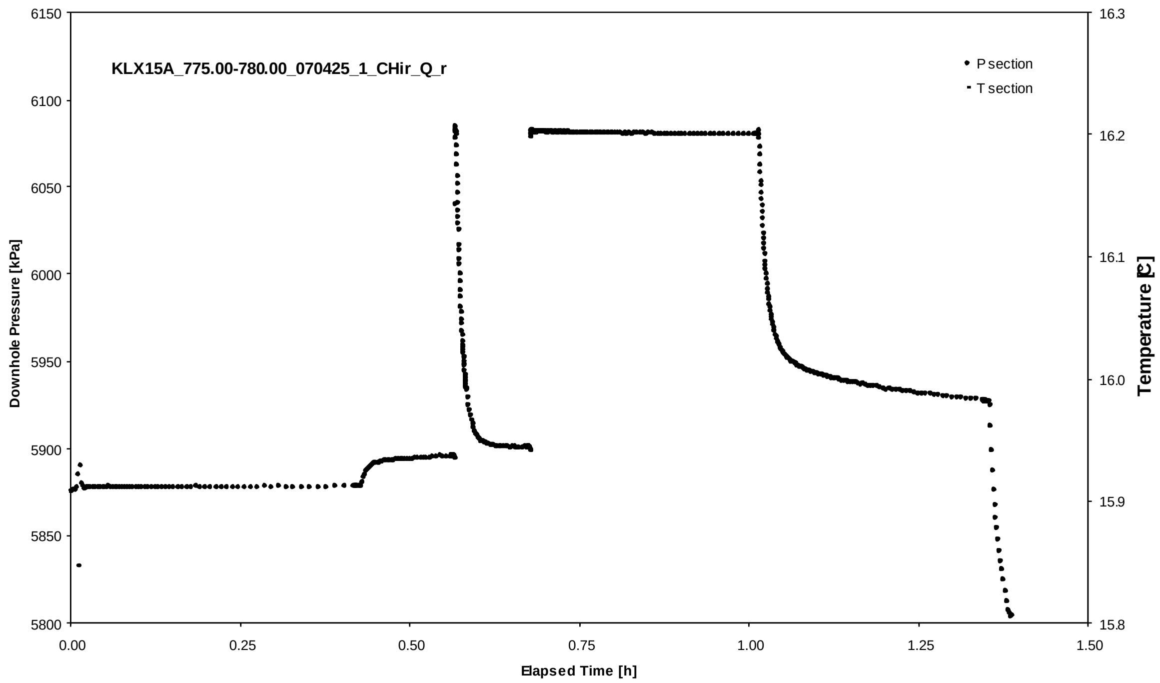
APPENDIX 2-98

Test 775.00 – 780.00 m

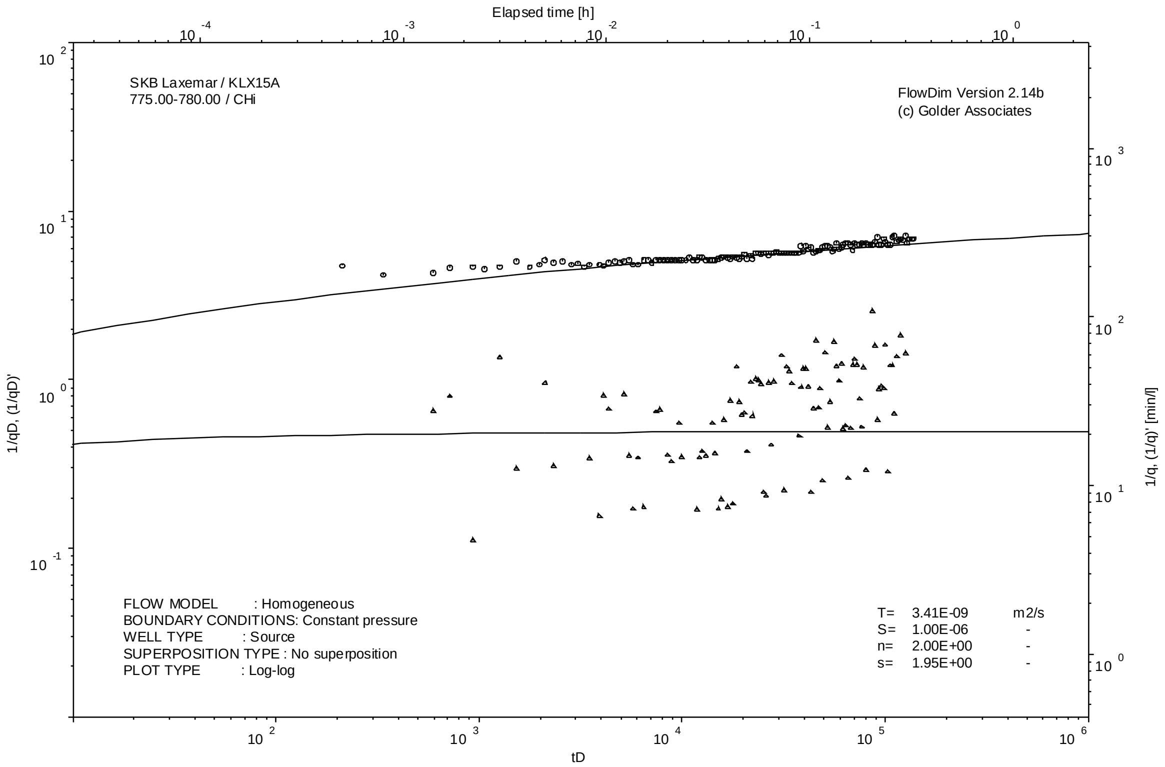
Analysis diagrams



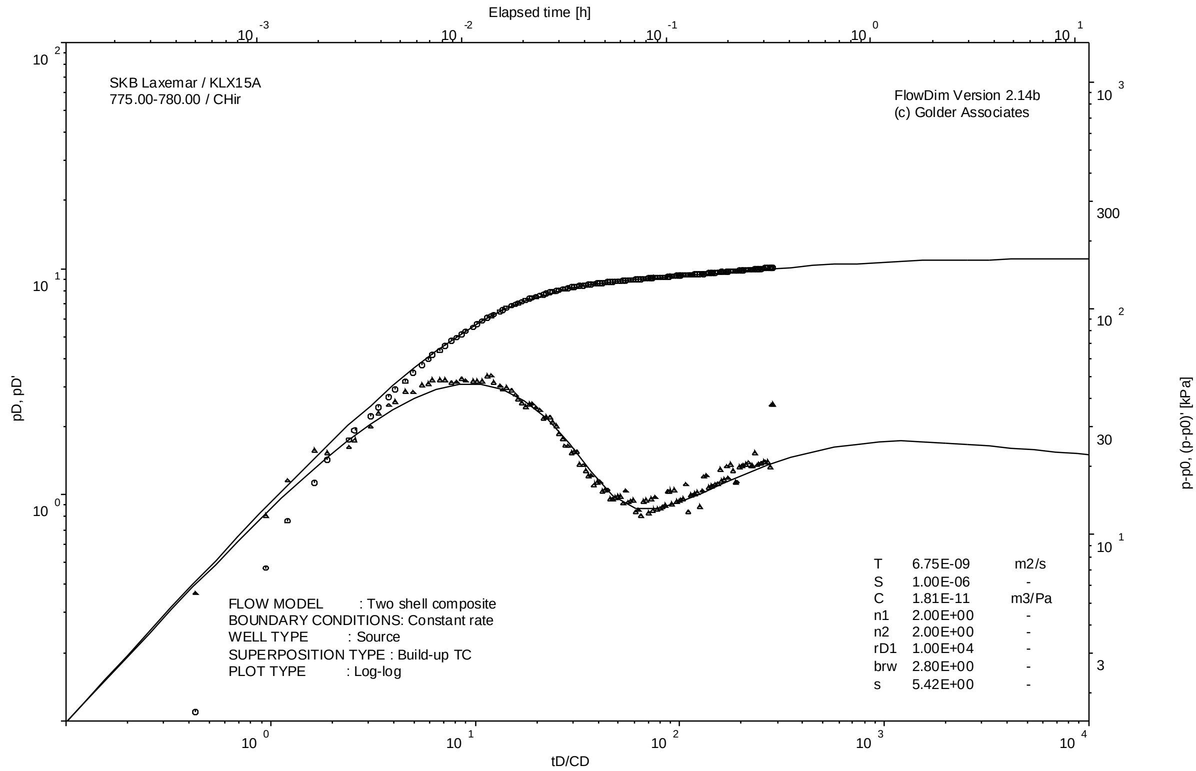
Pressure and flow rate vs. time; cartesian plot



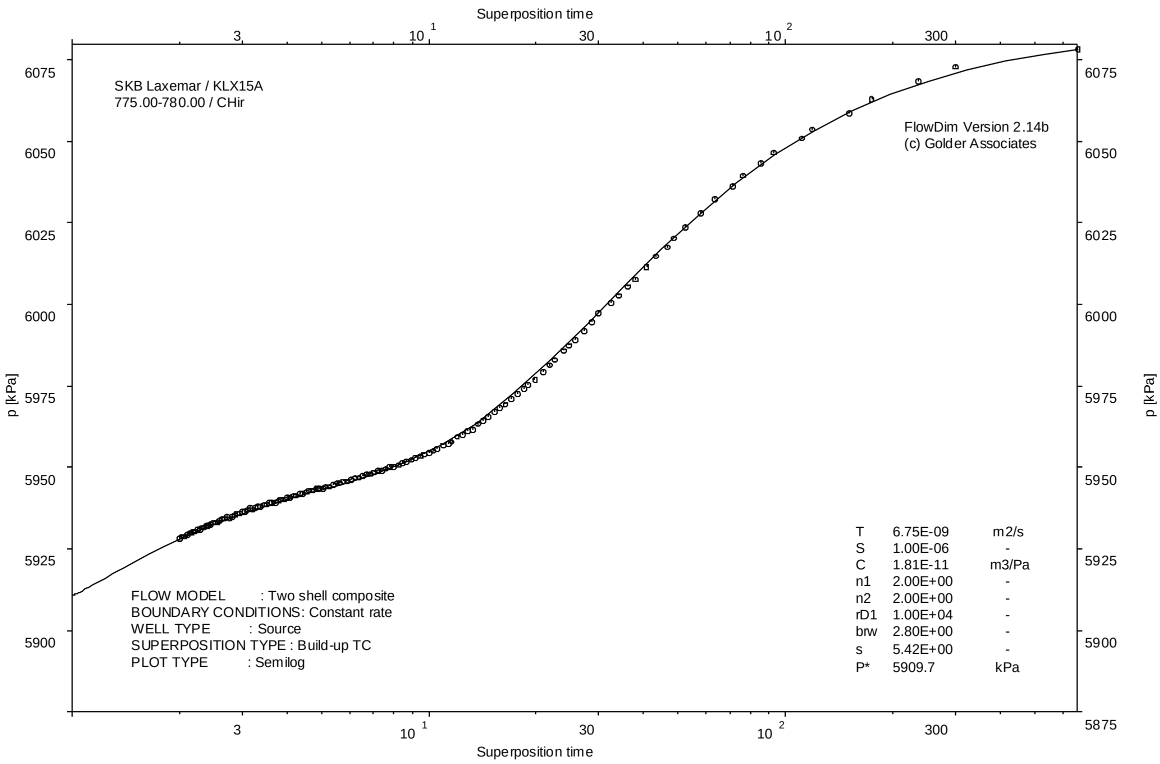
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

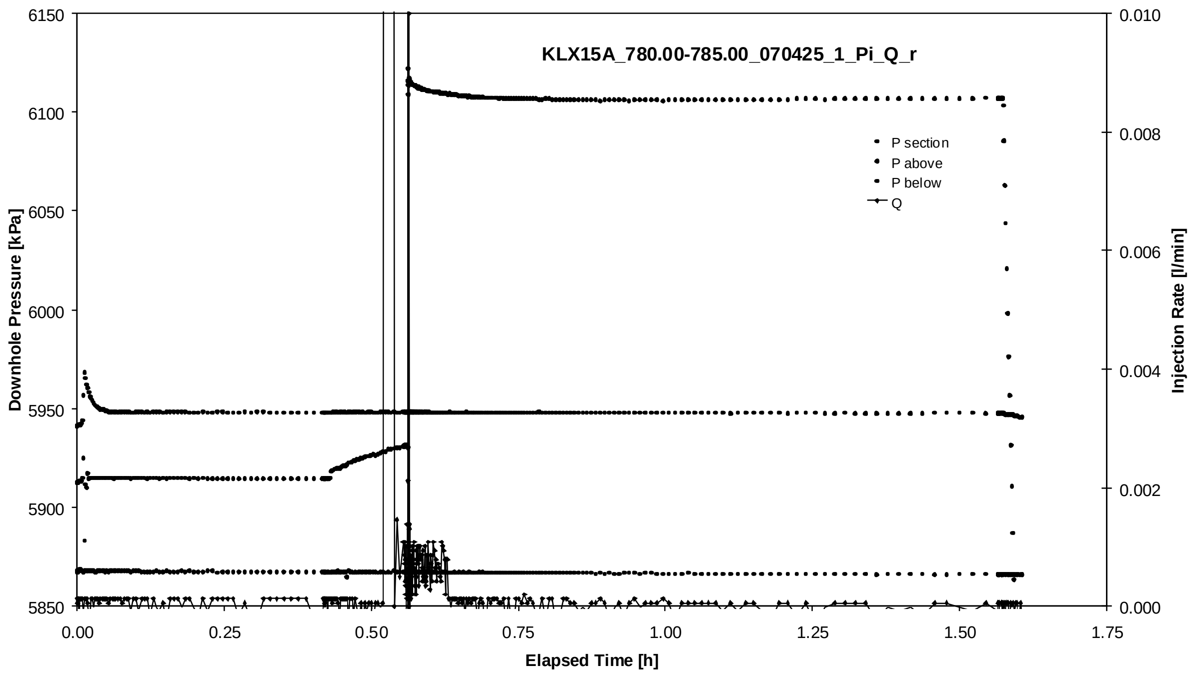


CHIR phase; HORNER match

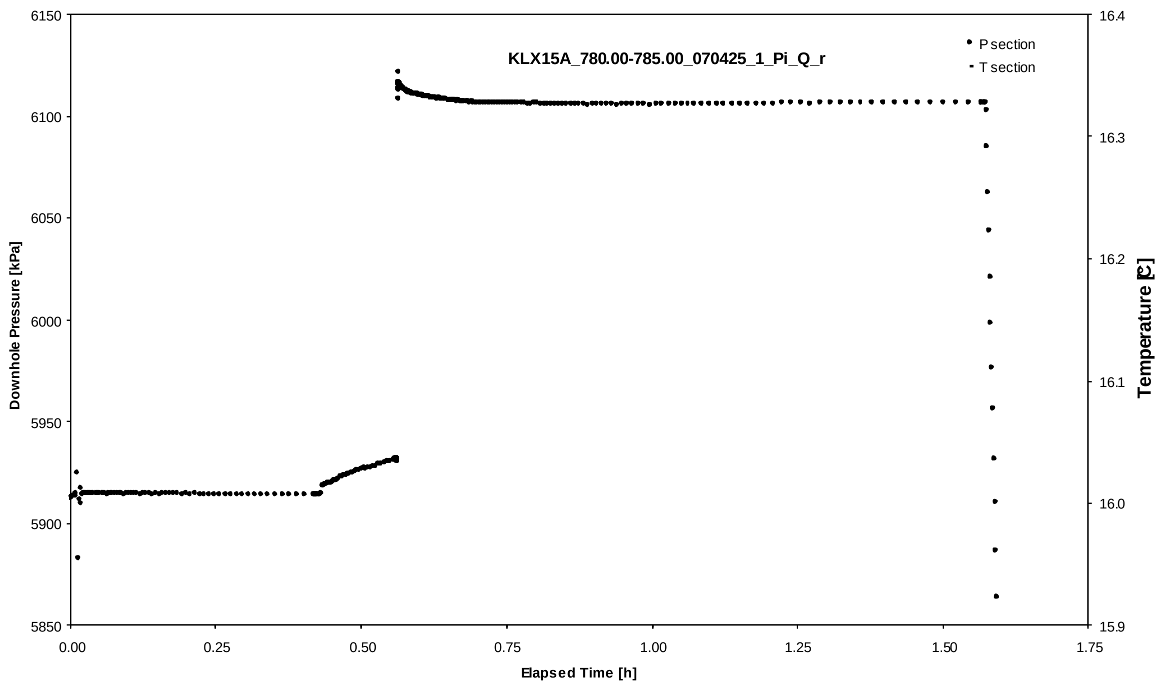
APPENDIX 2-99

Test 780.00 – 785.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

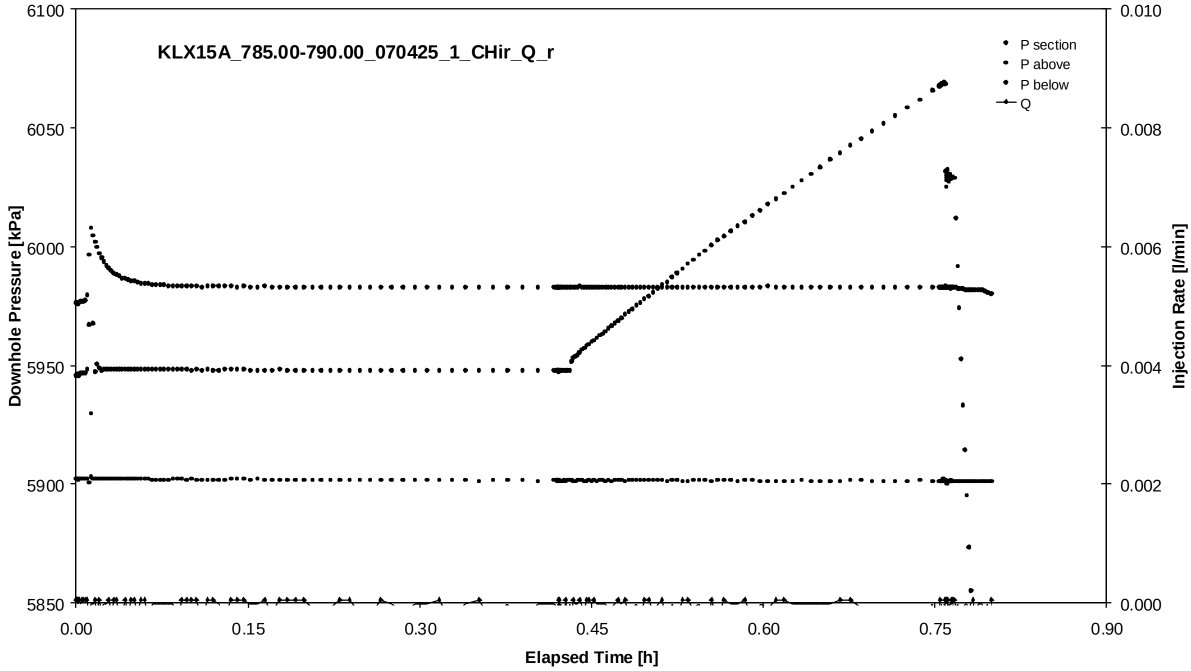
Not analysed

Pulse injection; deconvolution match

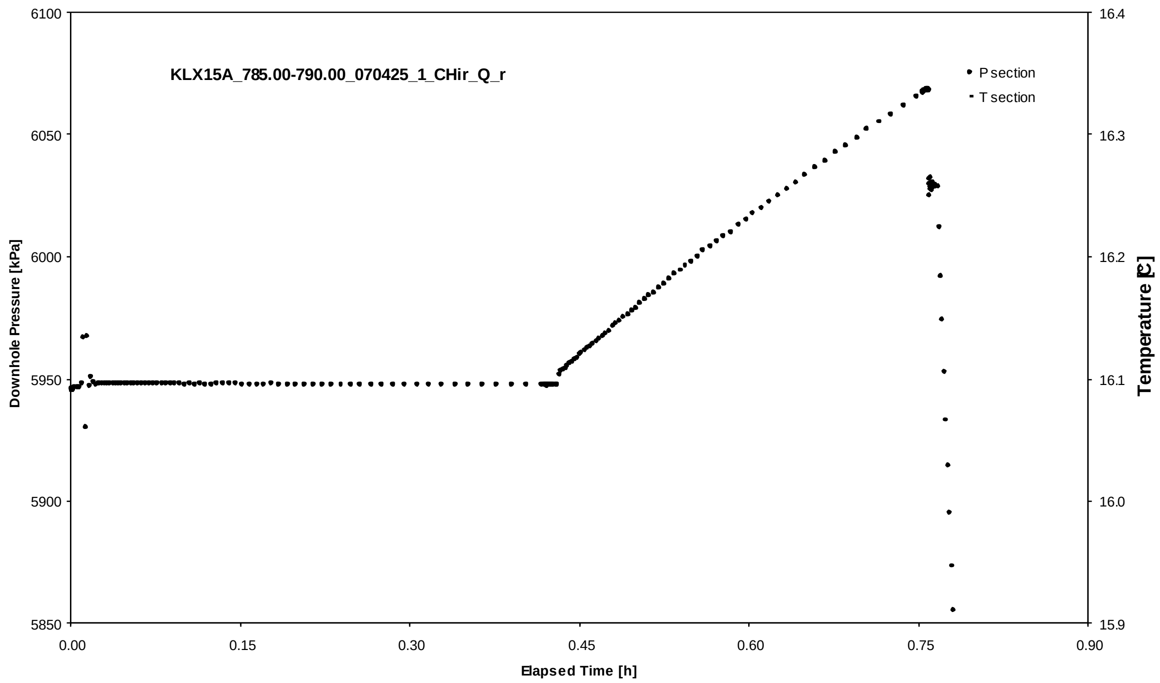
APPENDIX 2-100

Test 785.00 – 790.00 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

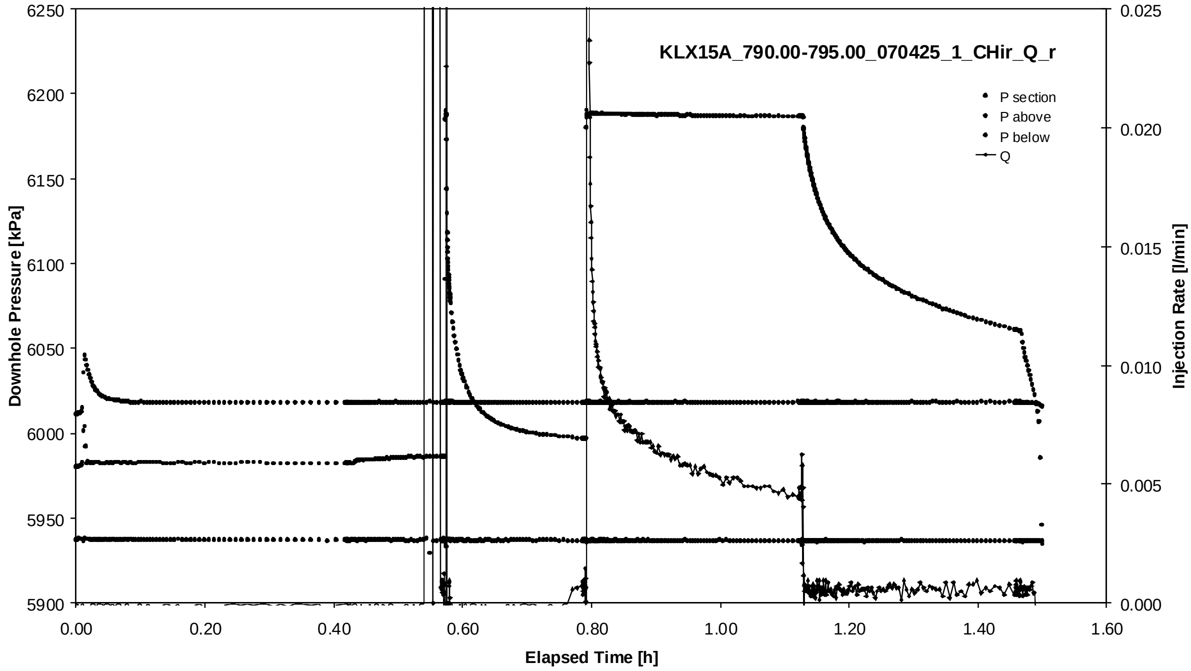
Not analysed

CHIR phase; HORNER match

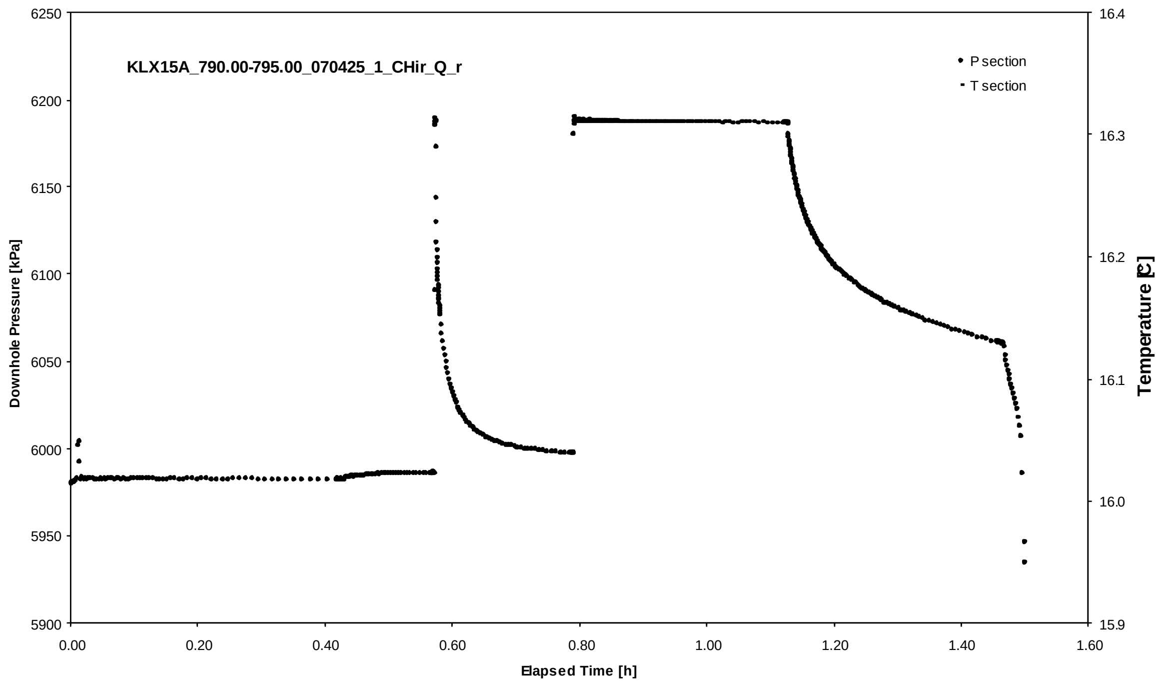
APPENDIX 2-101

Test 790.00 – 795.00 m

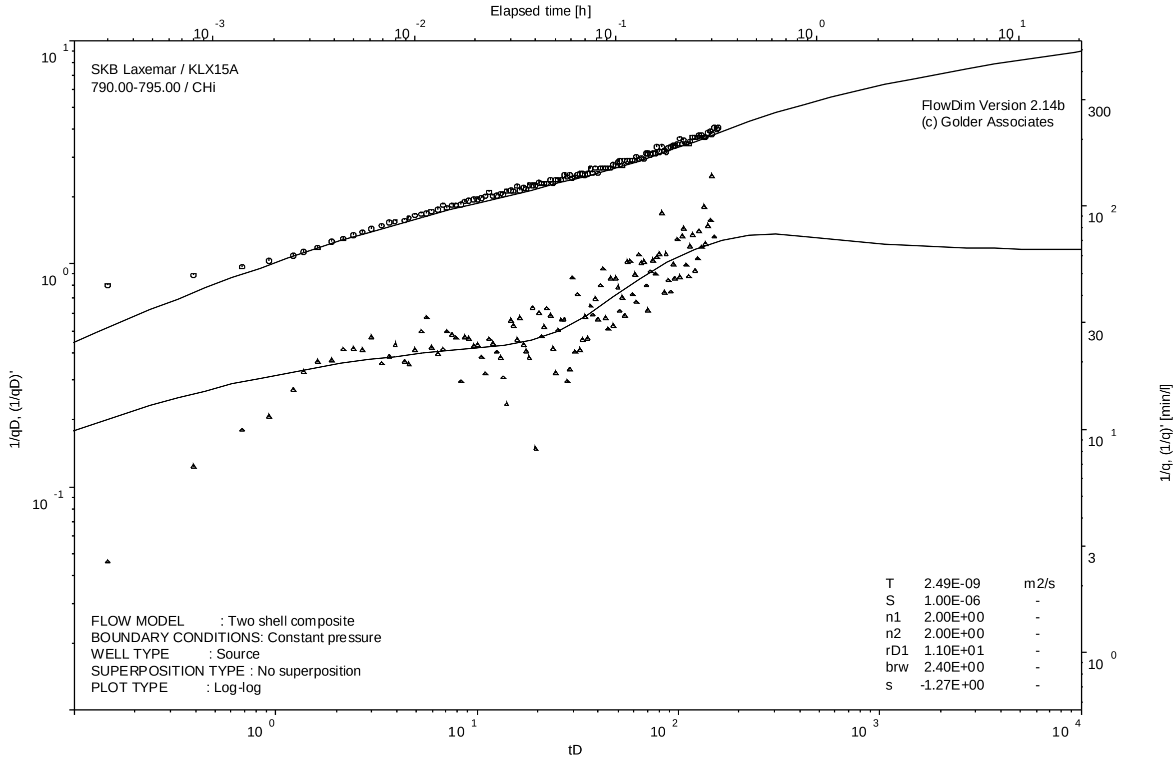
Analysis diagrams



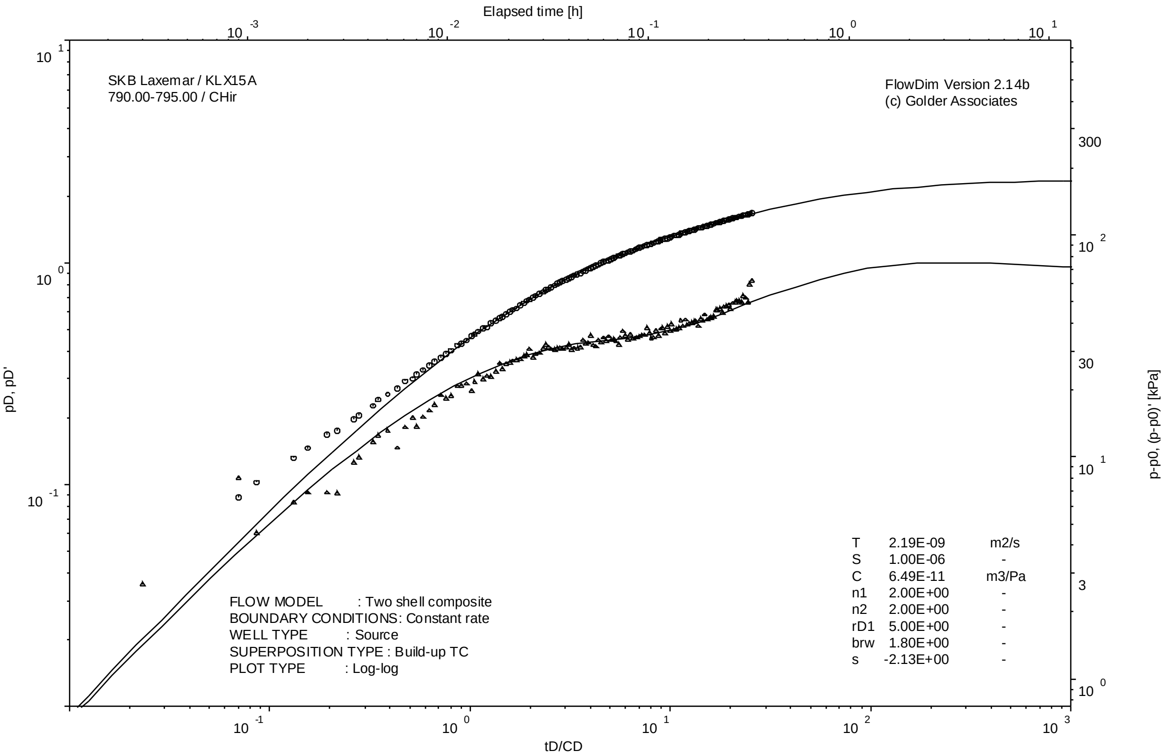
Pressure and flow rate vs. time; cartesian plot



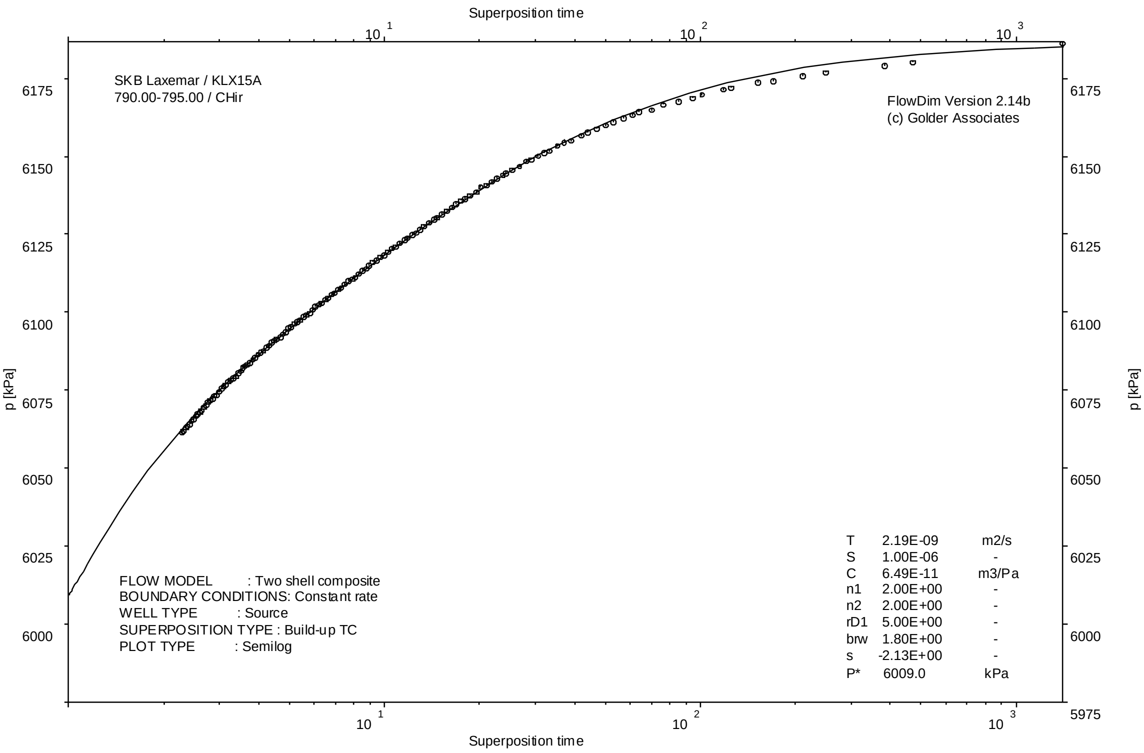
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

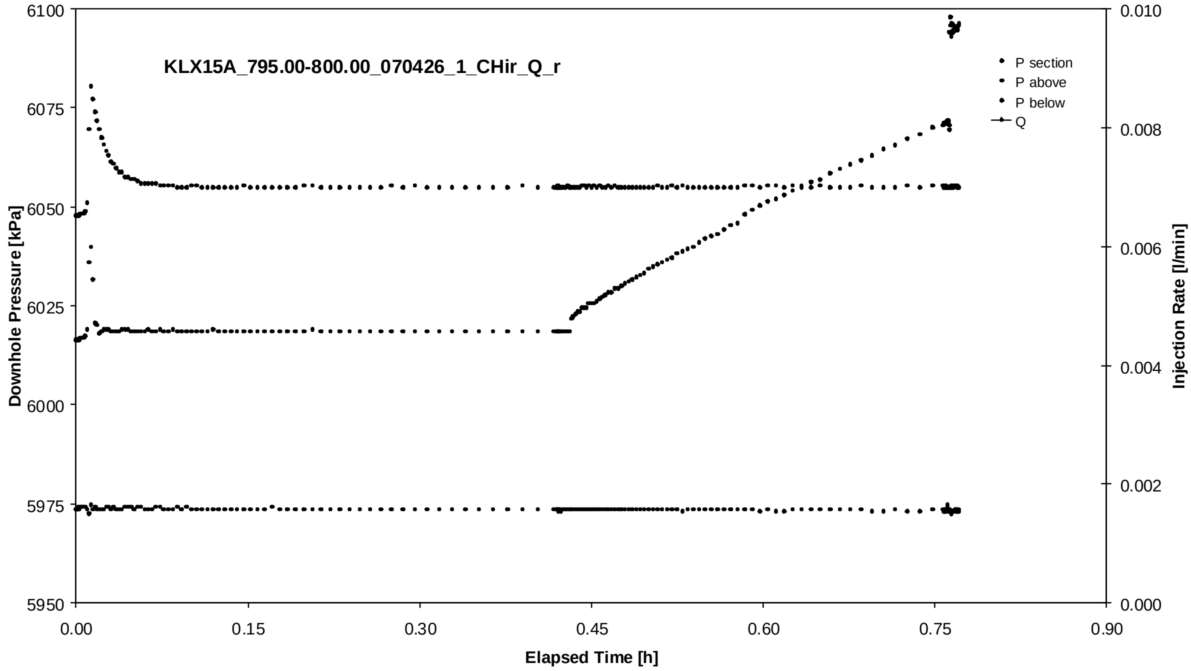


CHIR phase; HORNER match

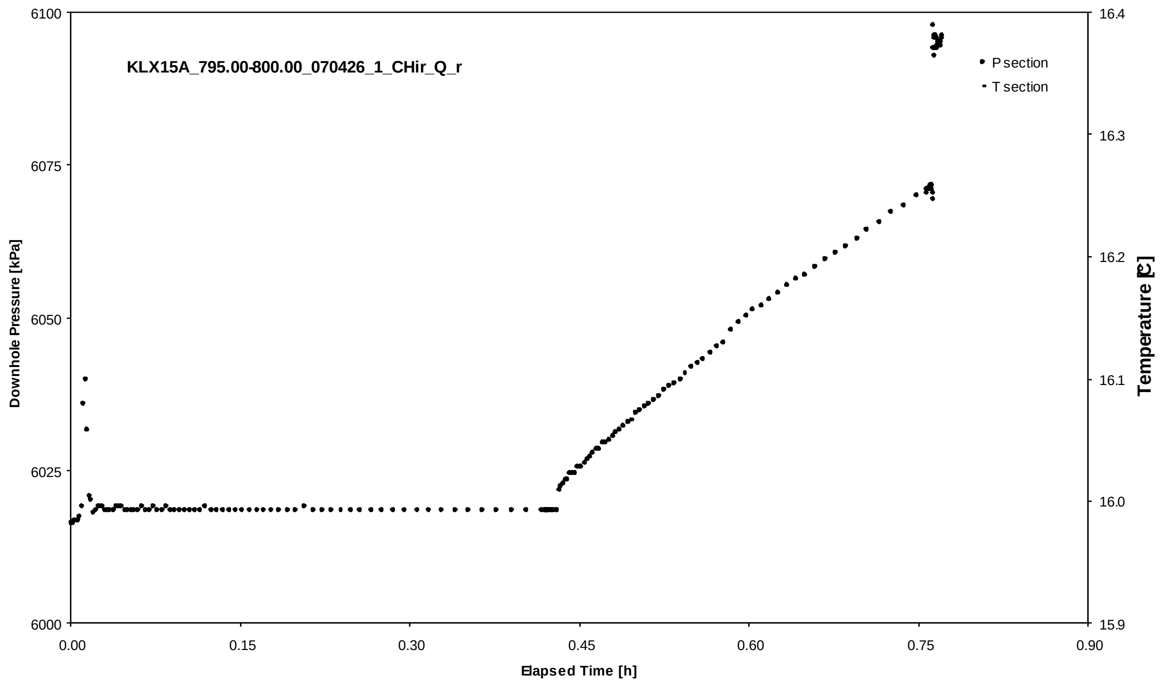
APPENDIX 2-102

Test 795.00 – 800.00 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

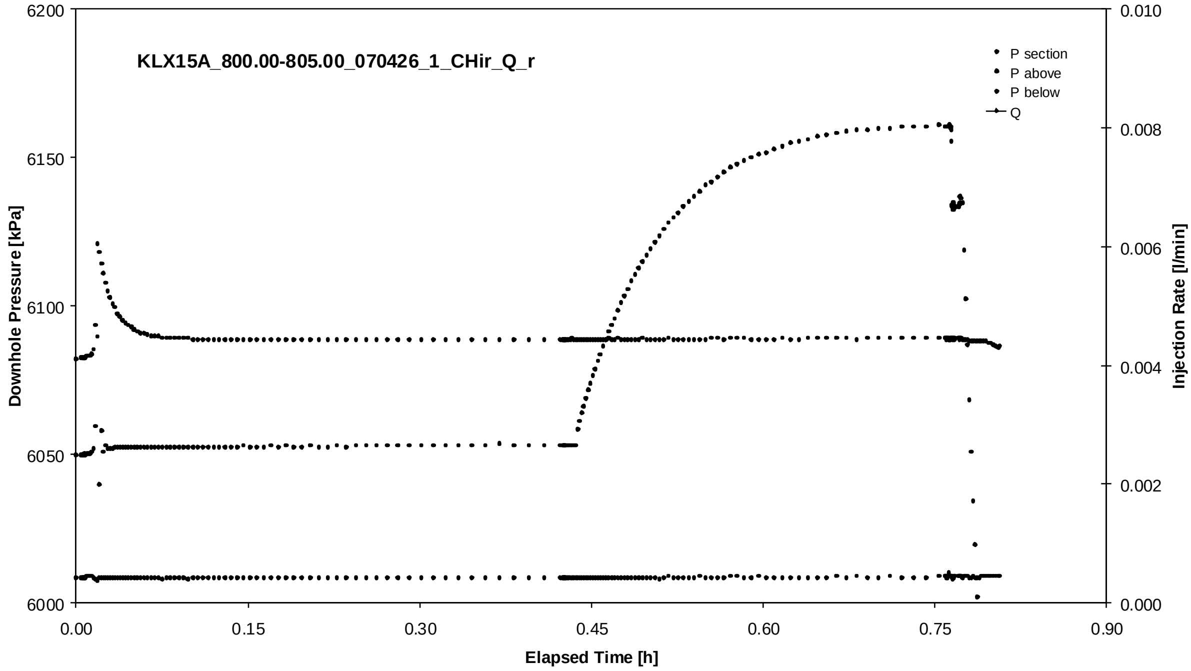
Not analysed

CHIR phase; HORNER match

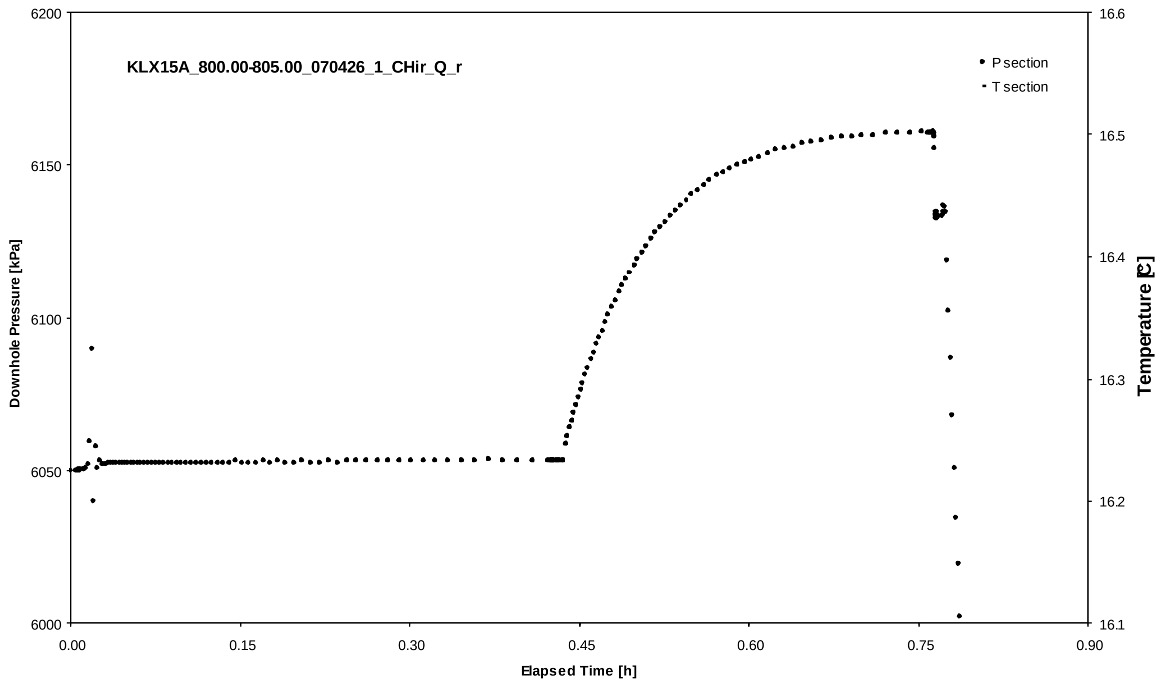
APPENDIX 2-103

Test 800.00 – 805.00 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

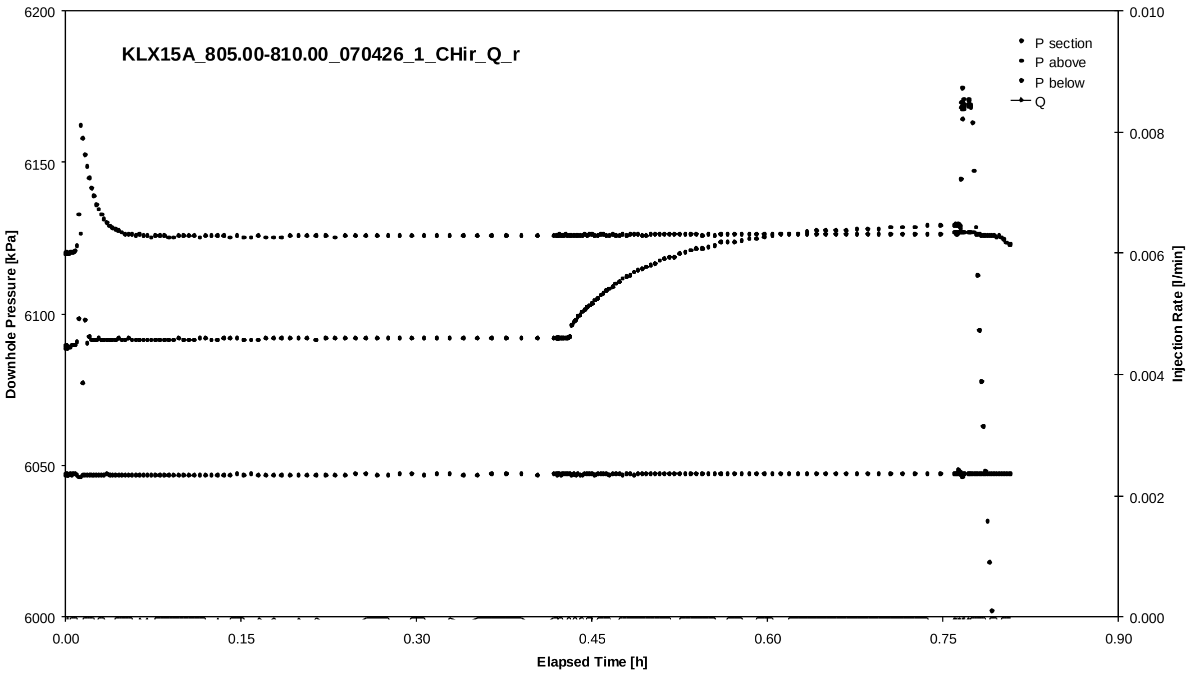
Not analysed

CHIR phase; HORNER match

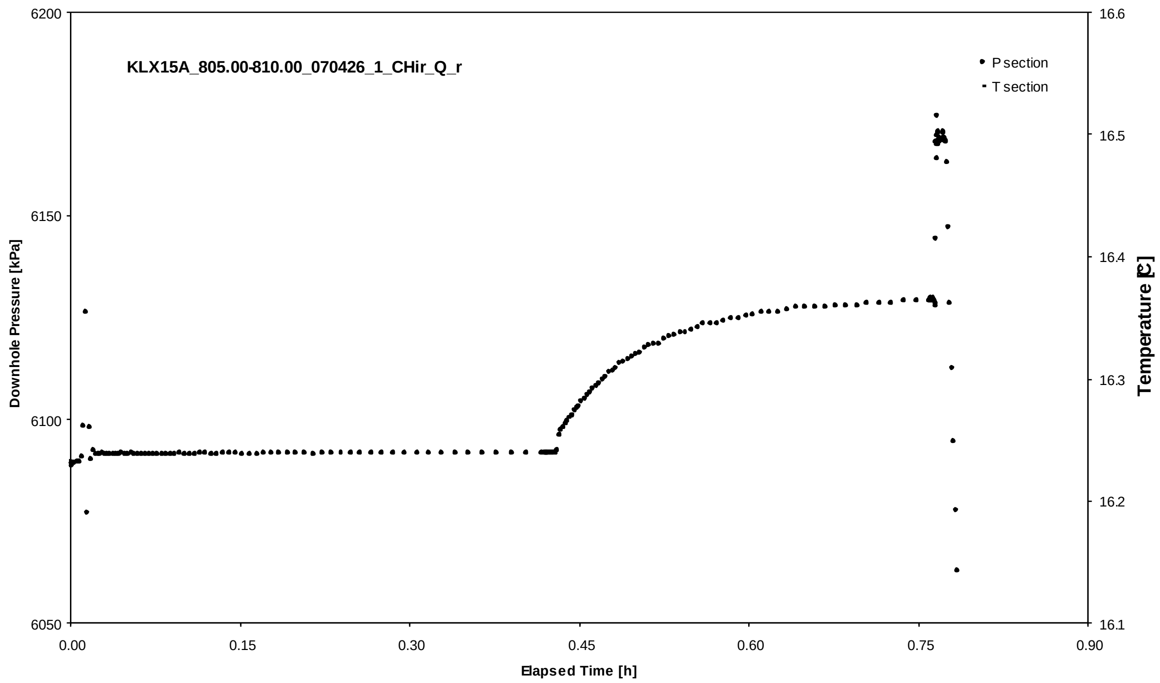
APPENDIX 2-104

Test 805.00 – 810.00 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

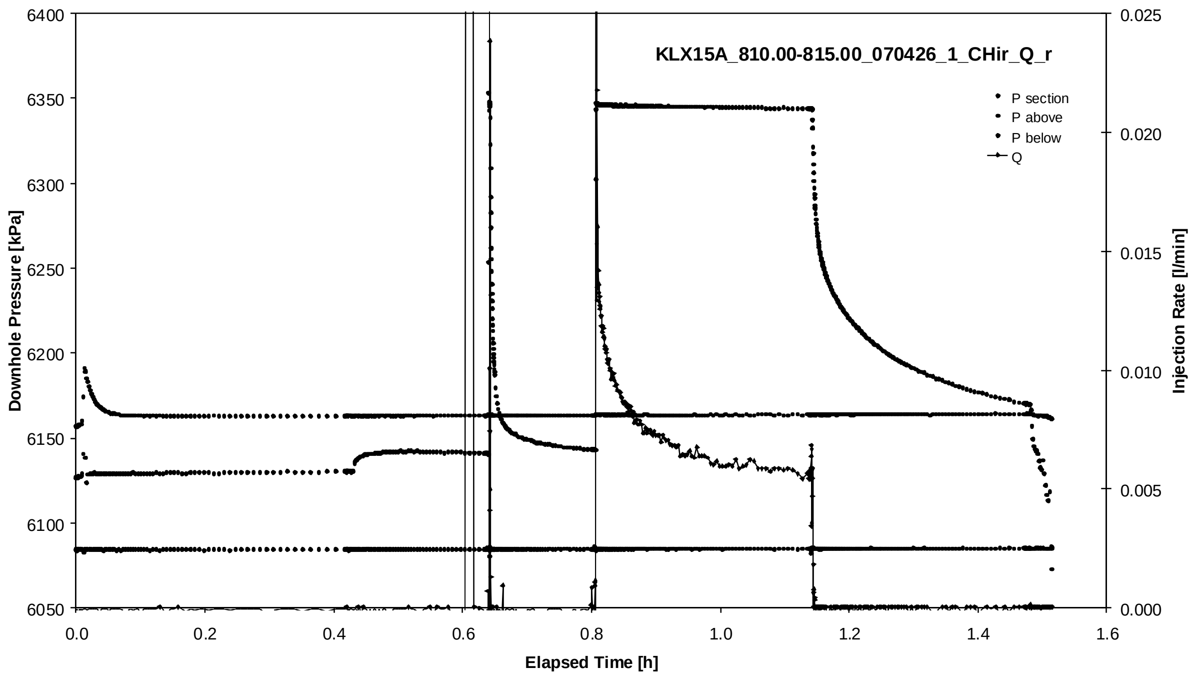
Not analysed

CHIR phase; HORNER match

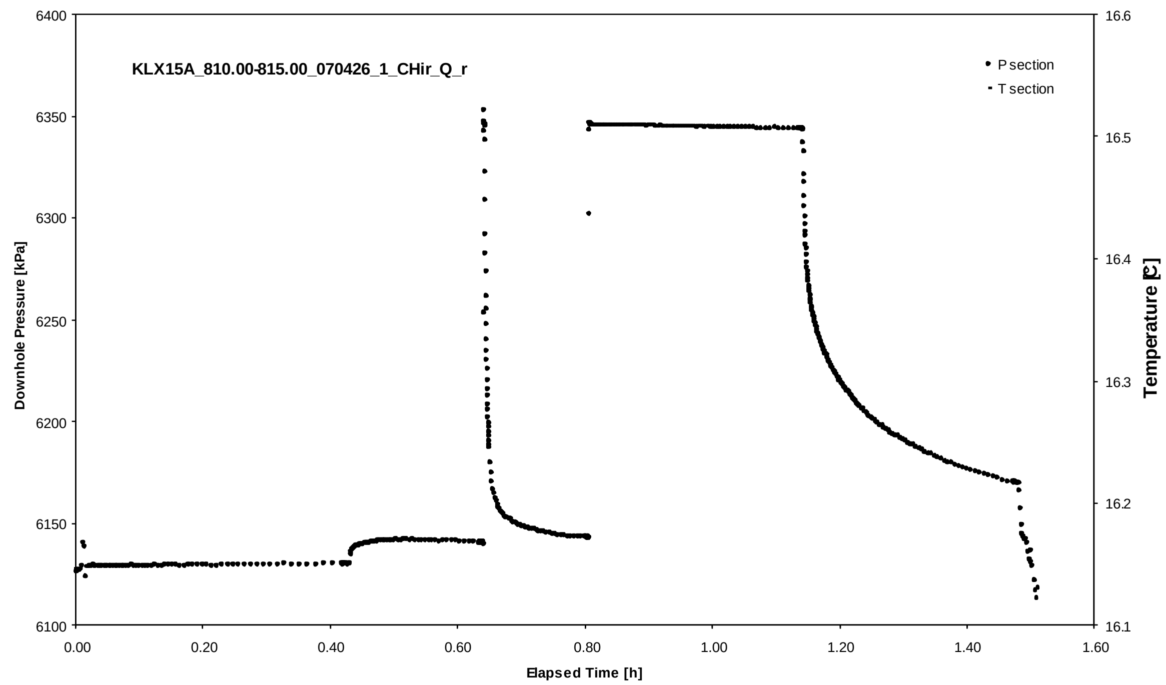
APPENDIX 2-105

Test 810.00 – 815.00 m

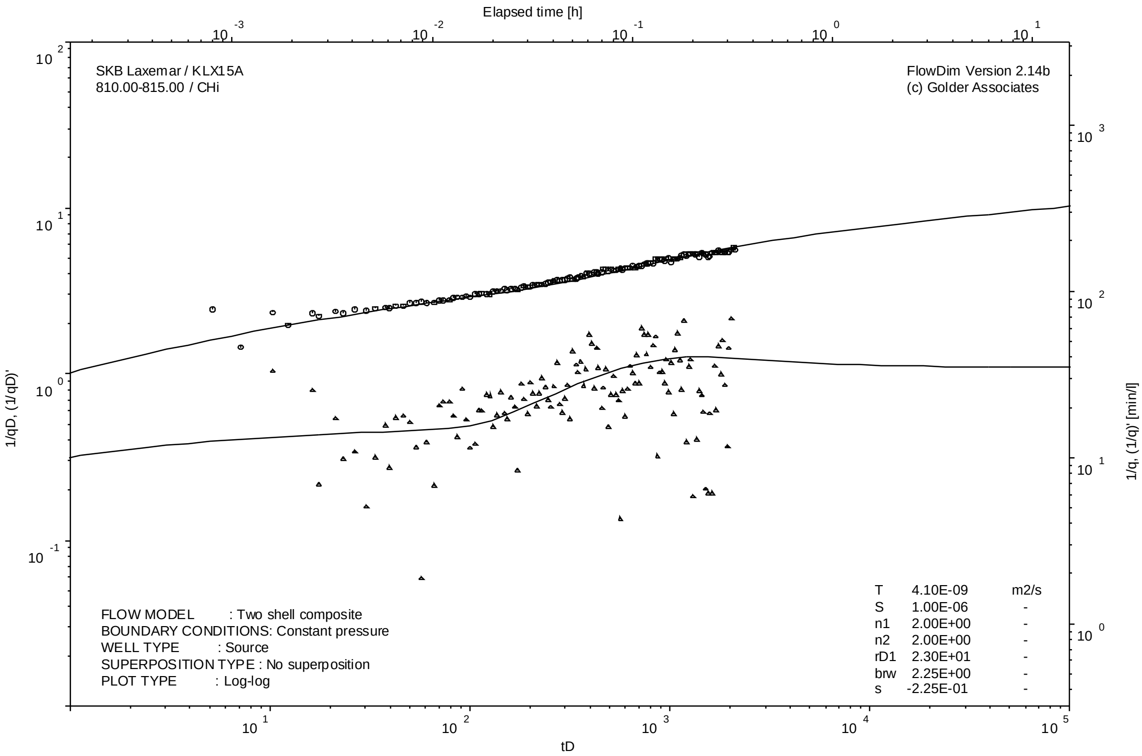
Analysis diagrams



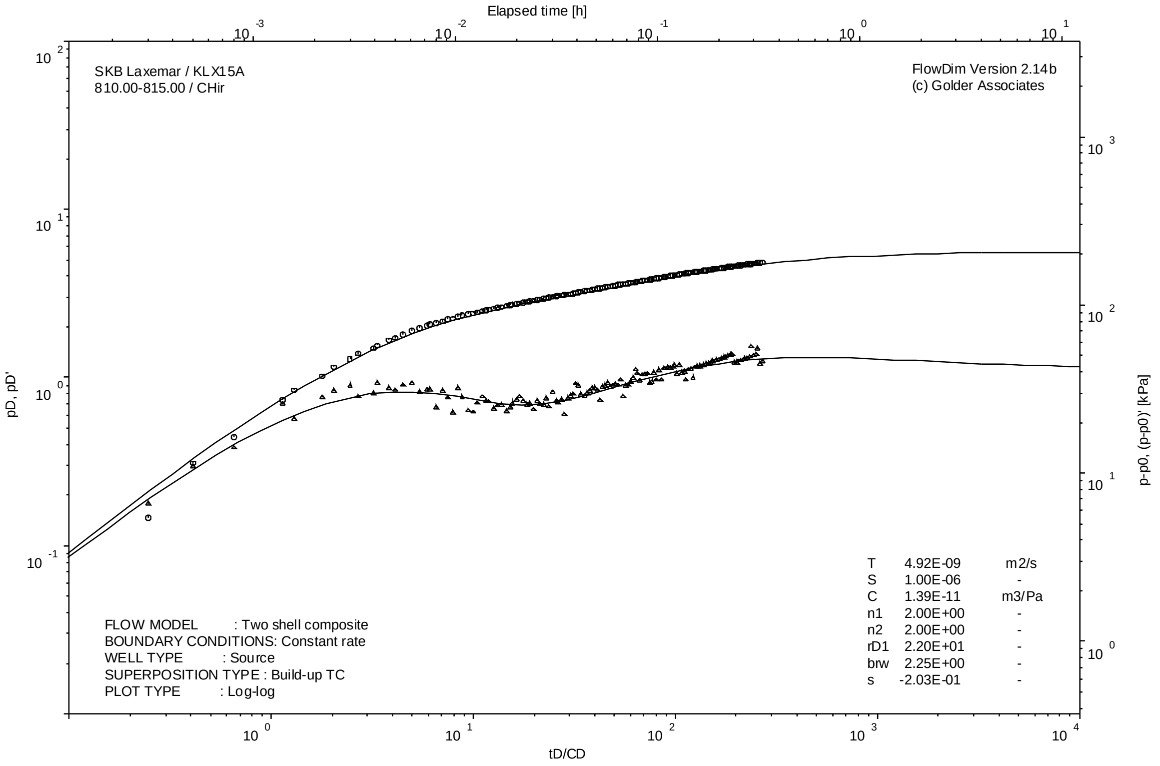
Pressure and flow rate vs. time; cartesian plot



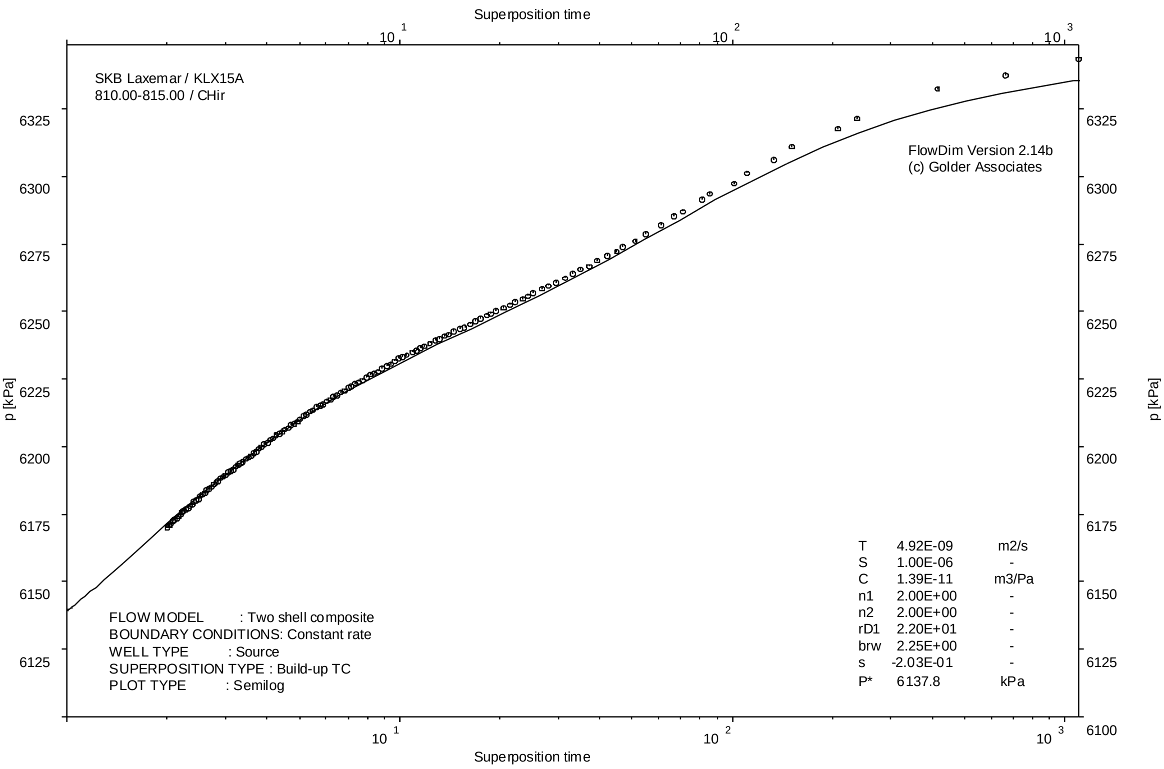
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

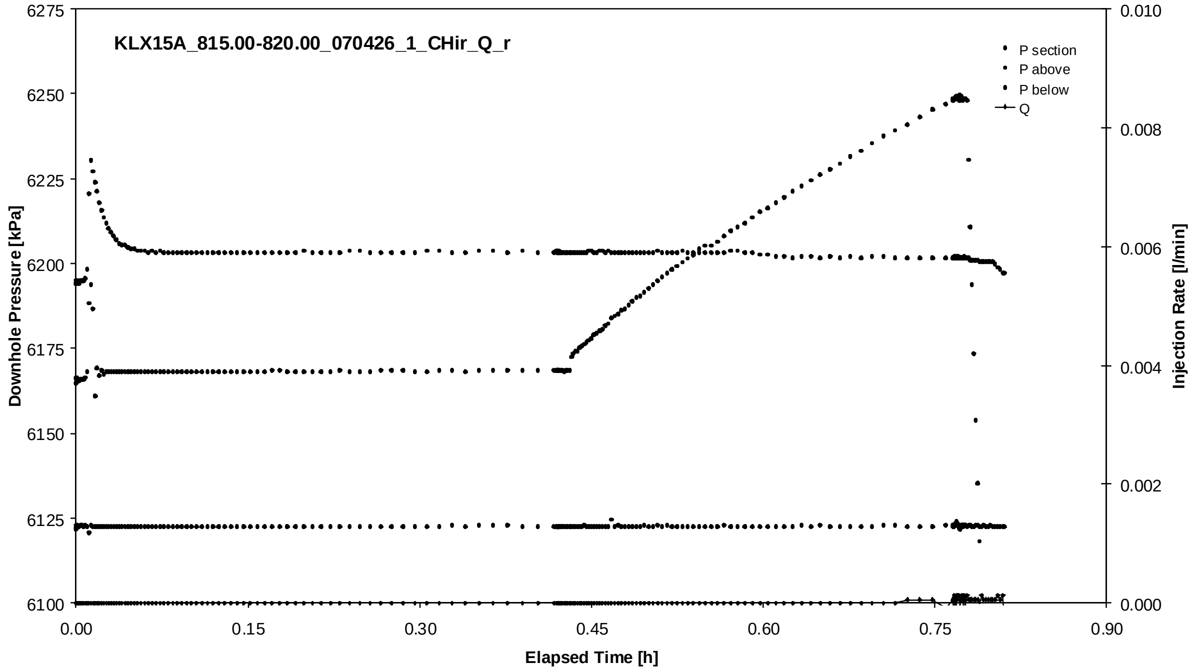


CHIR phase; HORNER match

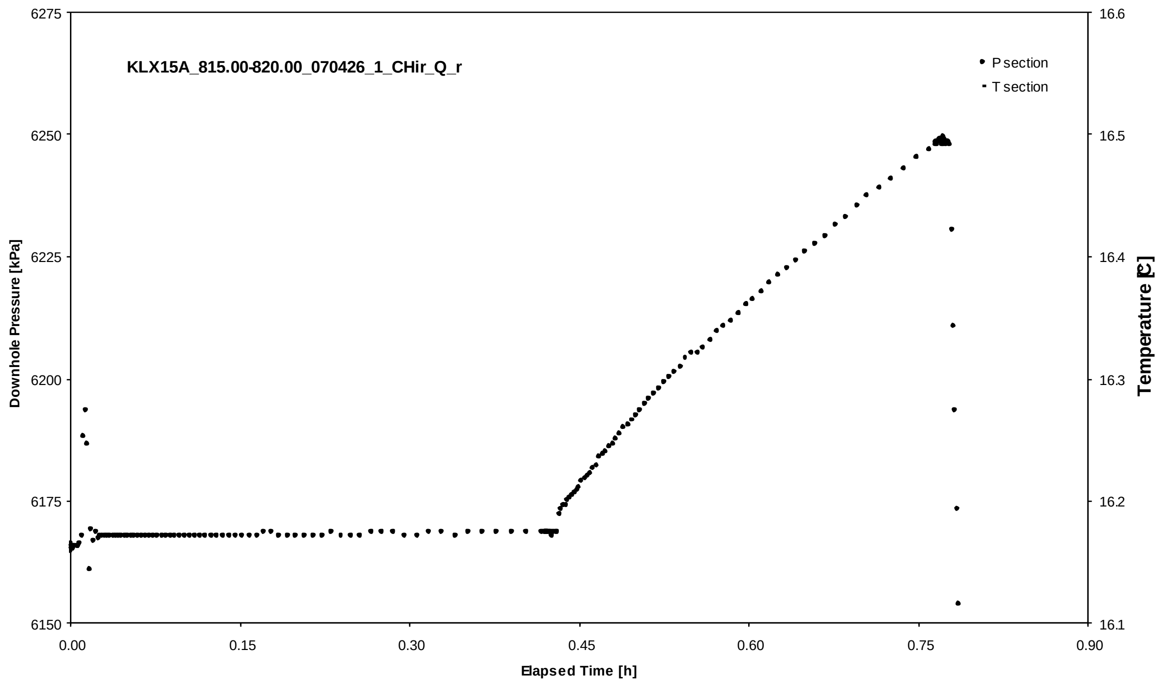
APPENDIX 2-106

Test 815.00 – 820.00 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

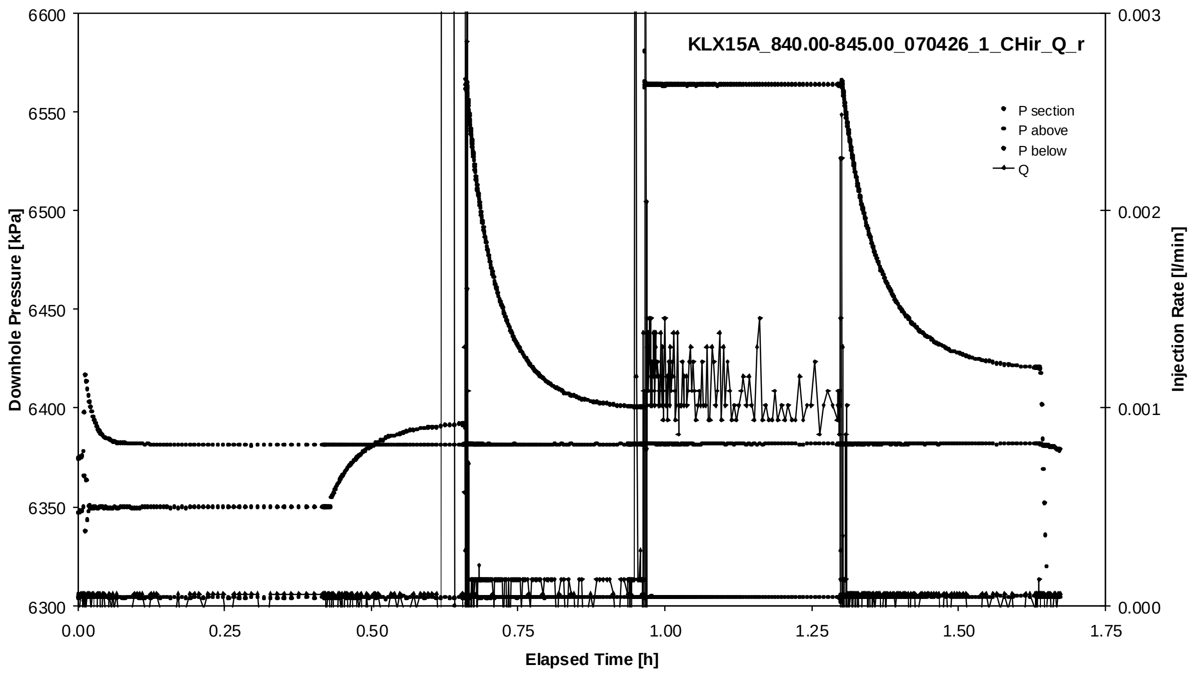
Not analysed

CHIR phase; HORNER match

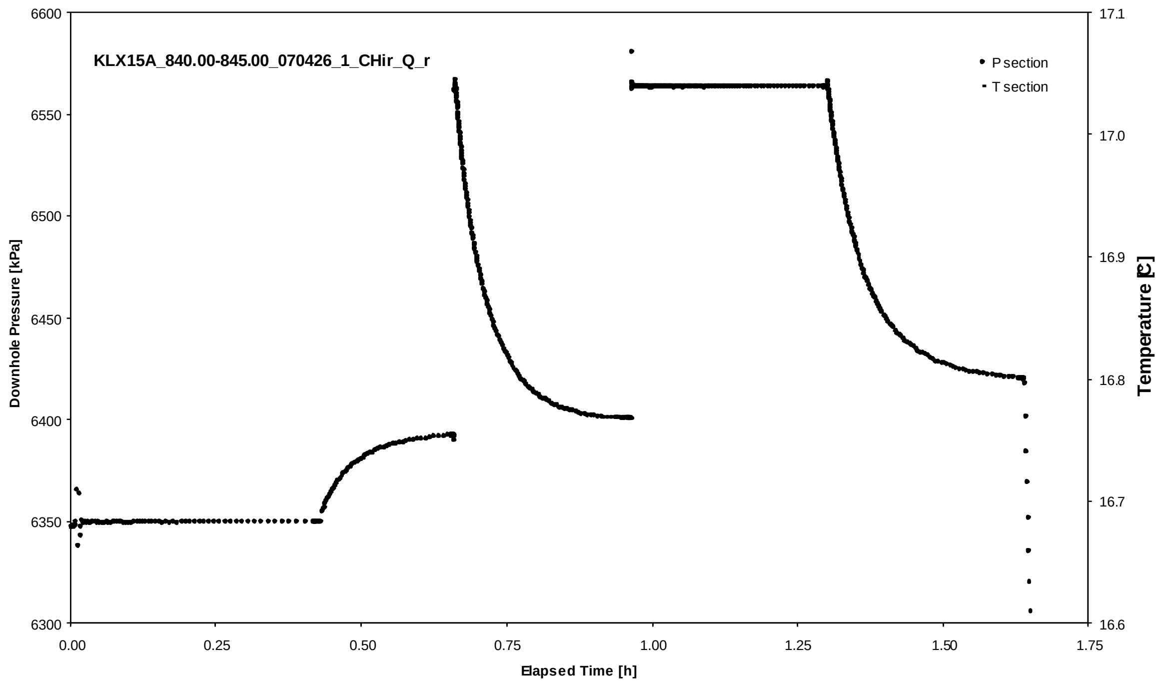
APPENDIX 2-107

Test 840.00 – 845.00 m

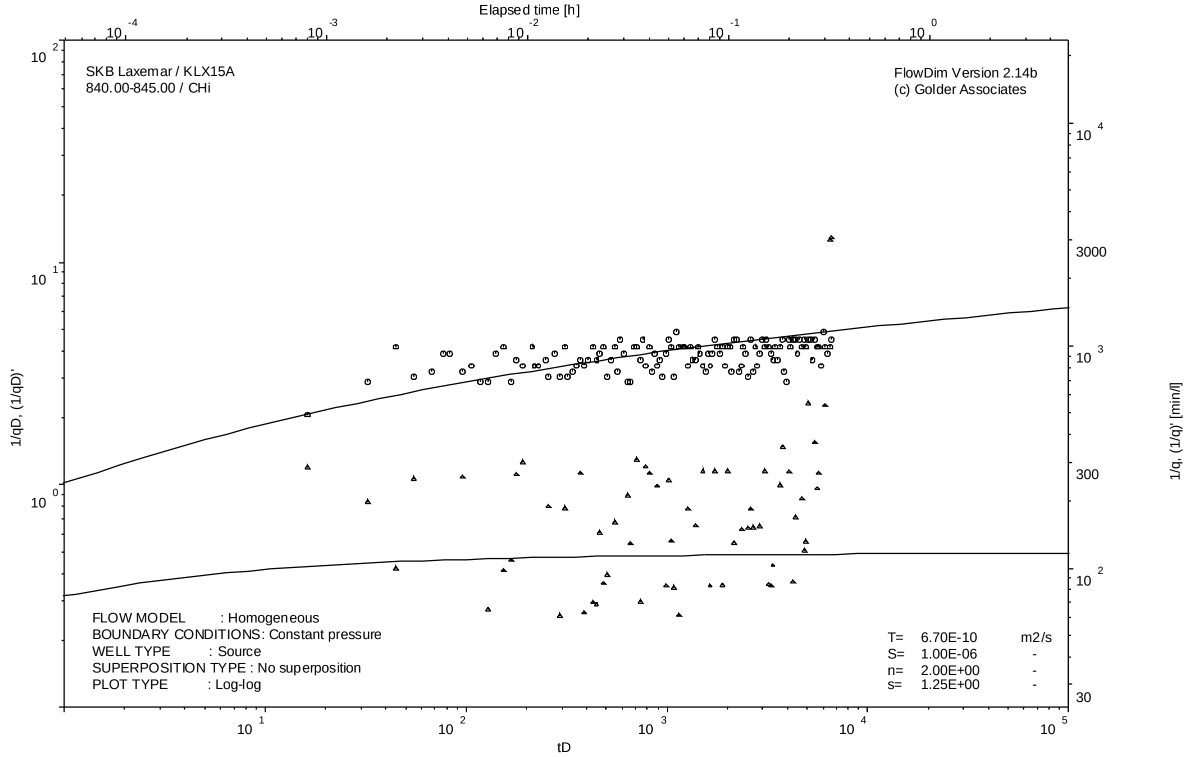
Analysis diagrams



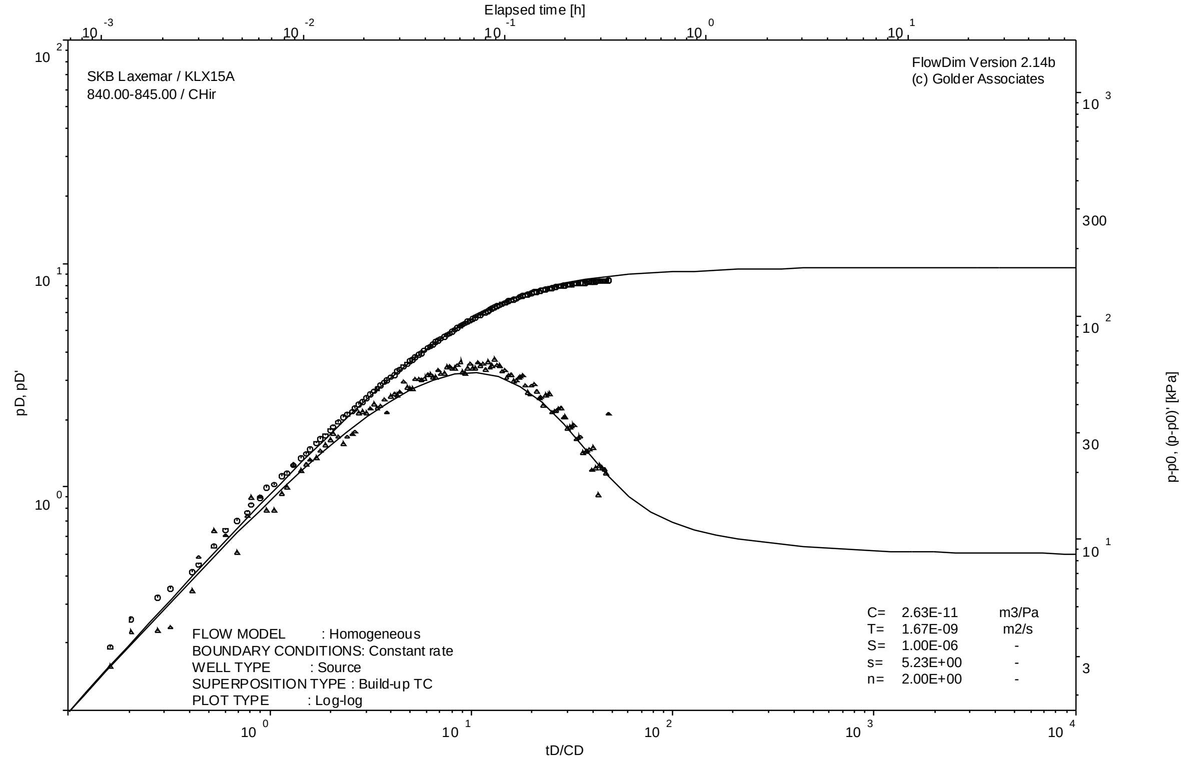
Pressure and flow rate vs. time; cartesian plot



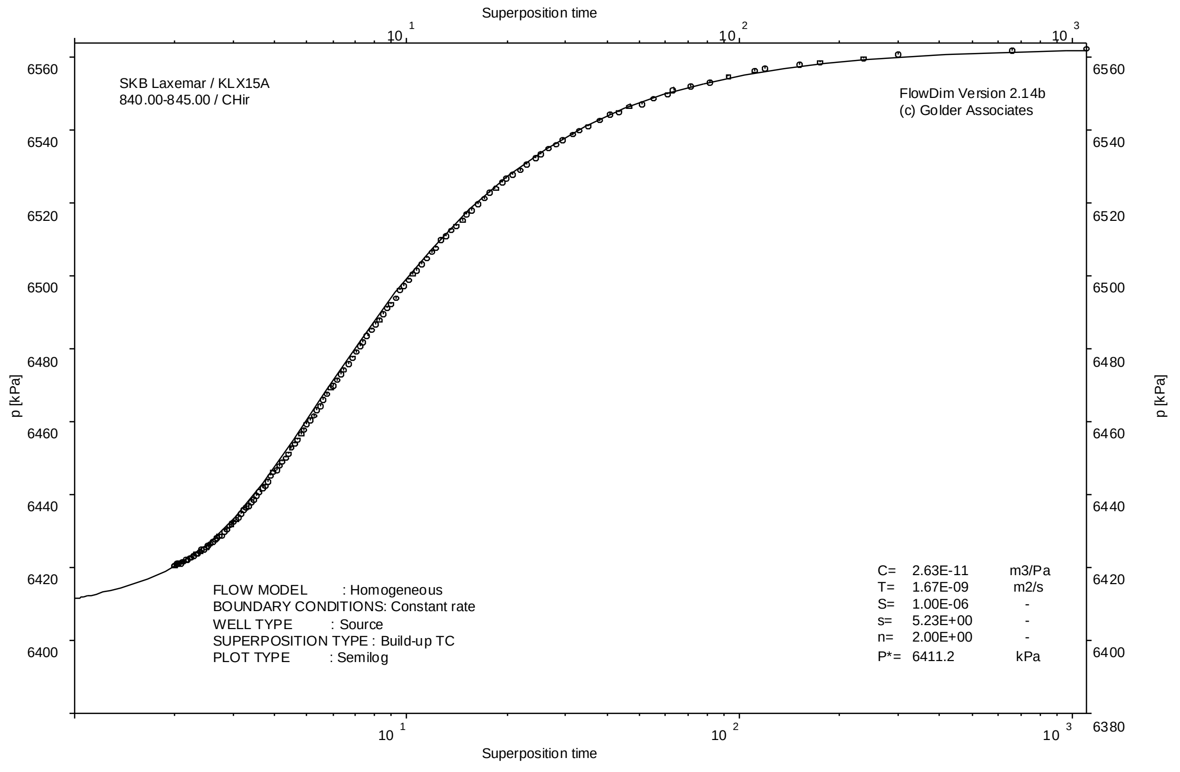
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

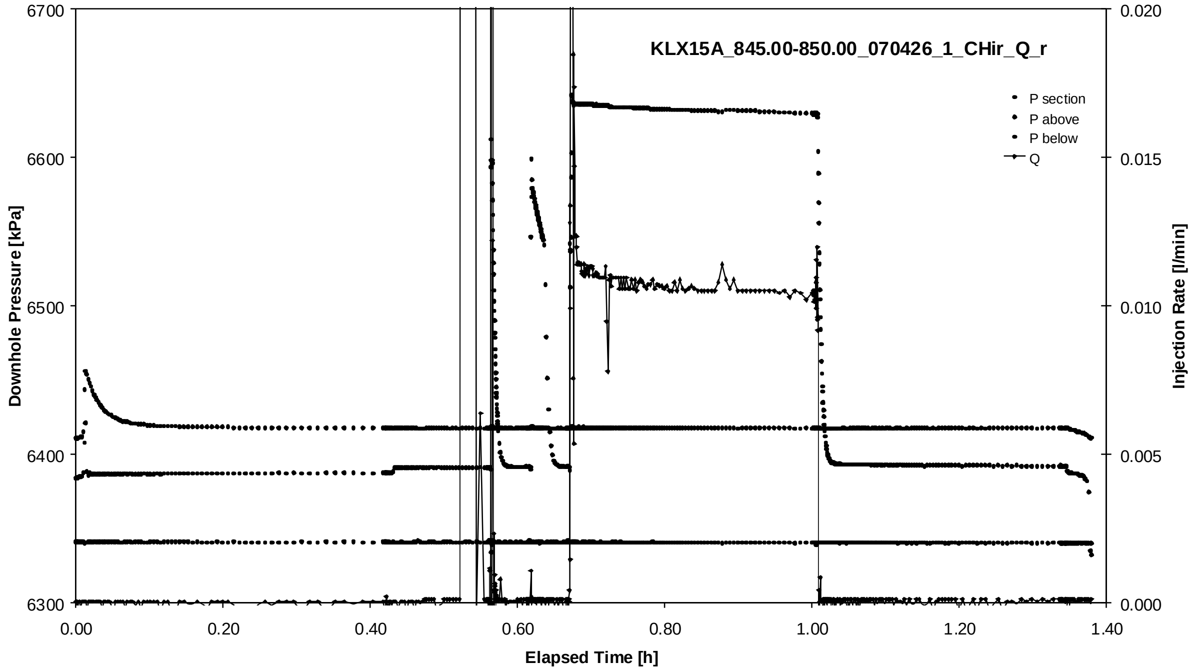


CHIR phase; HORNER match

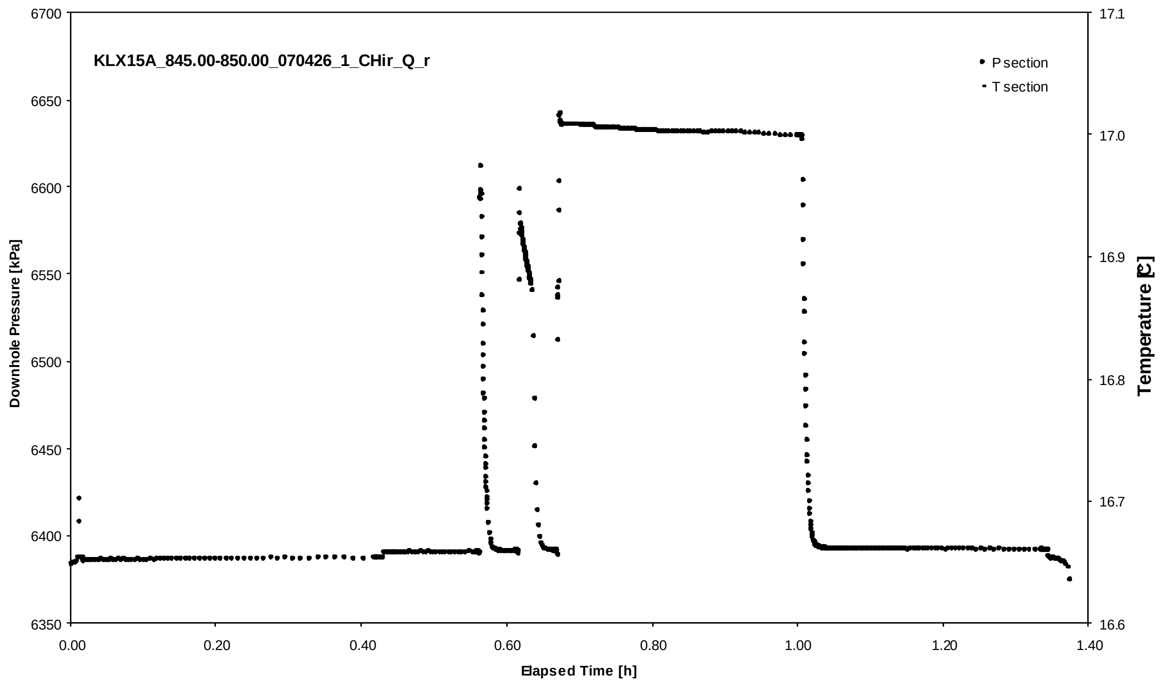
APPENDIX 2-108

Test 845.00 – 850.00 m

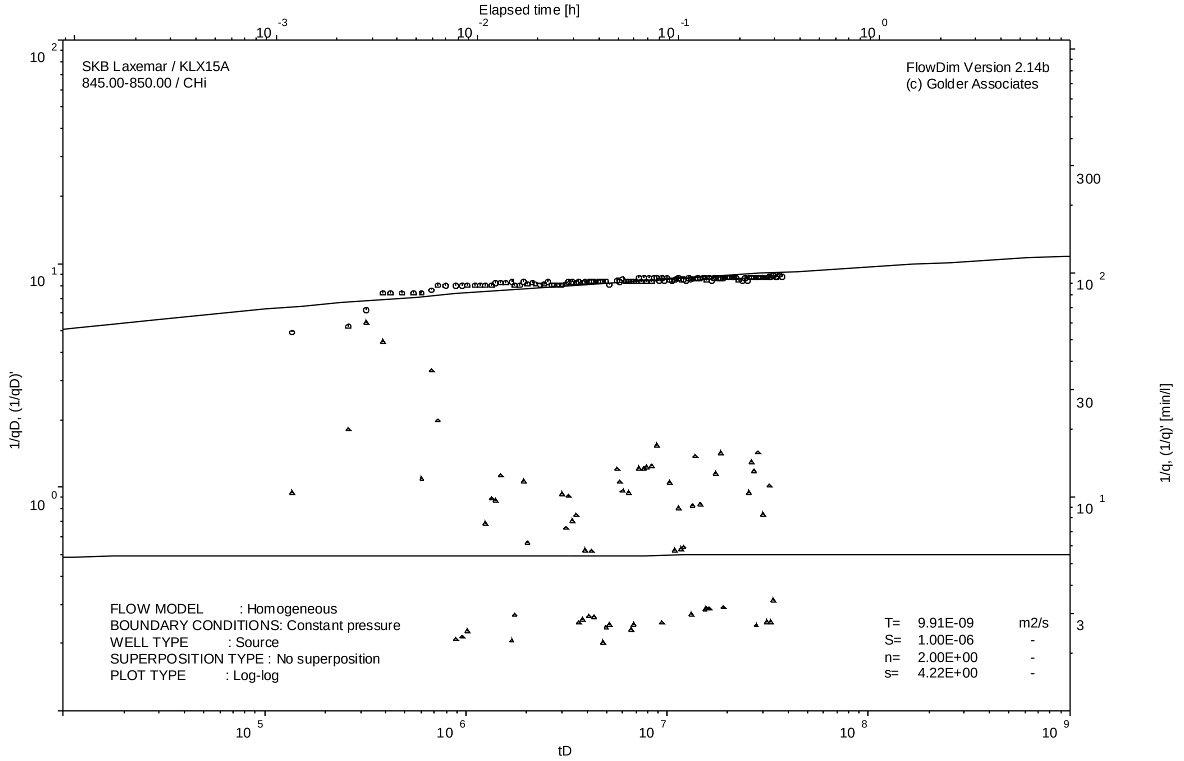
Analysis diagrams



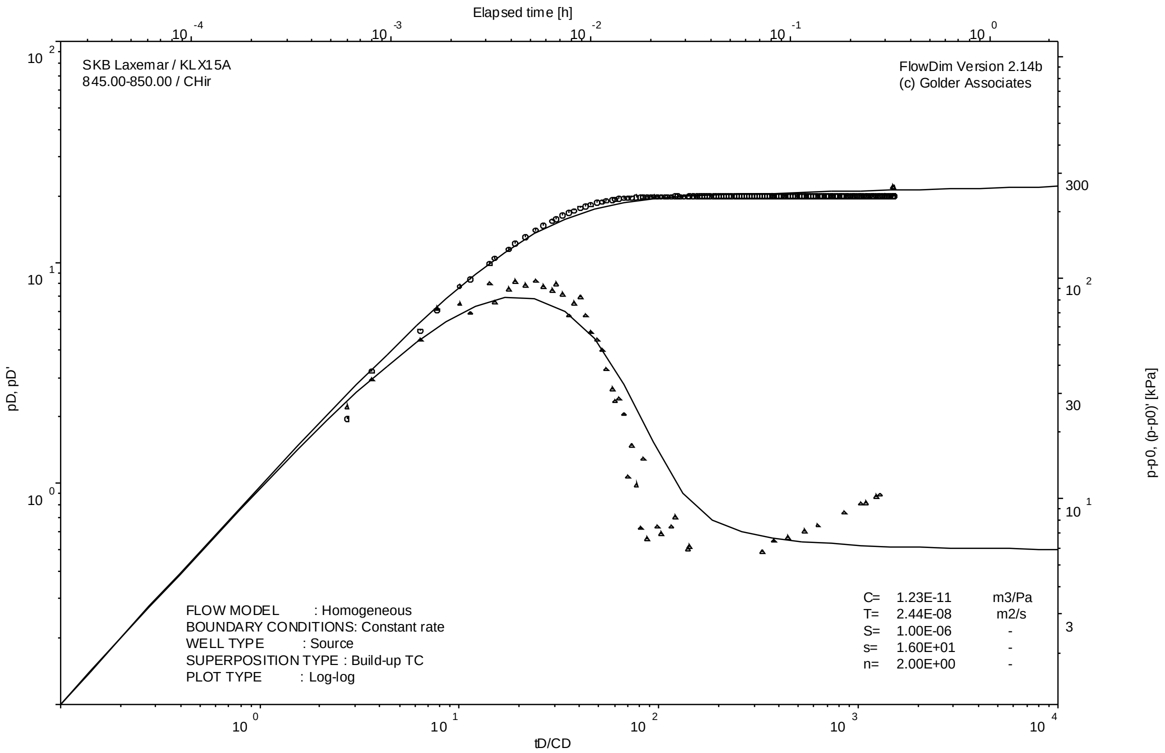
Pressure and flow rate vs. time; cartesian plot



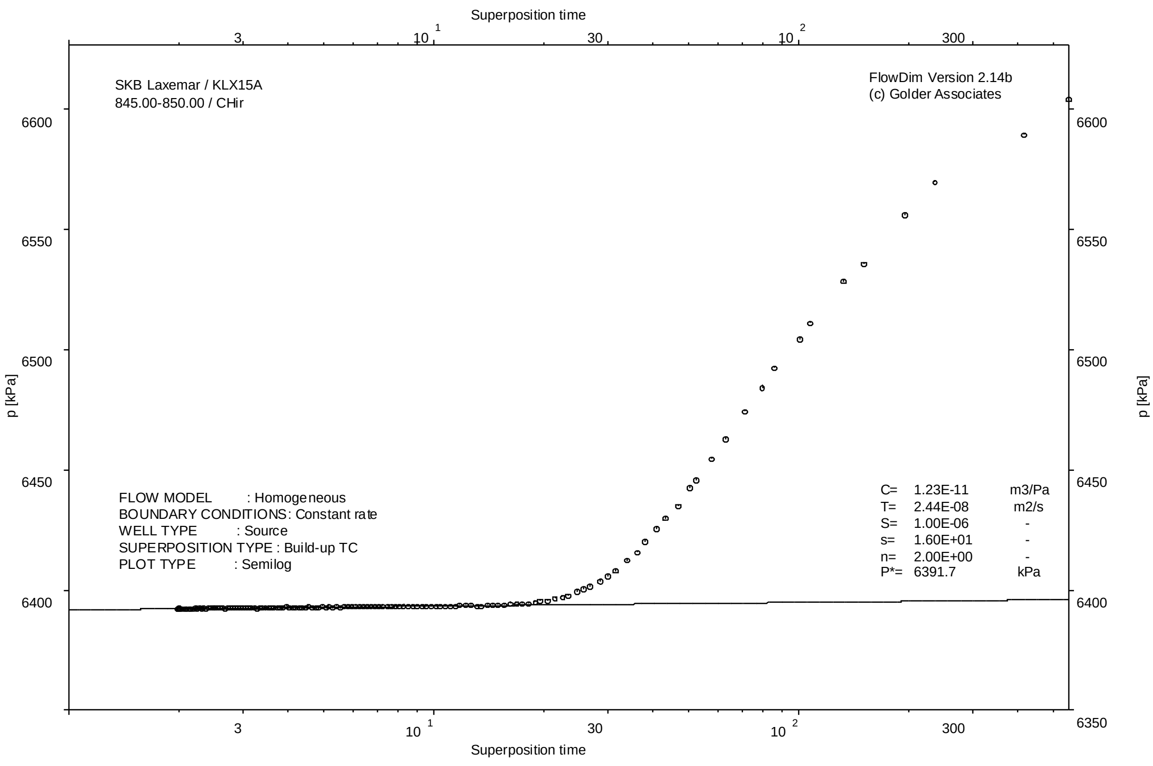
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

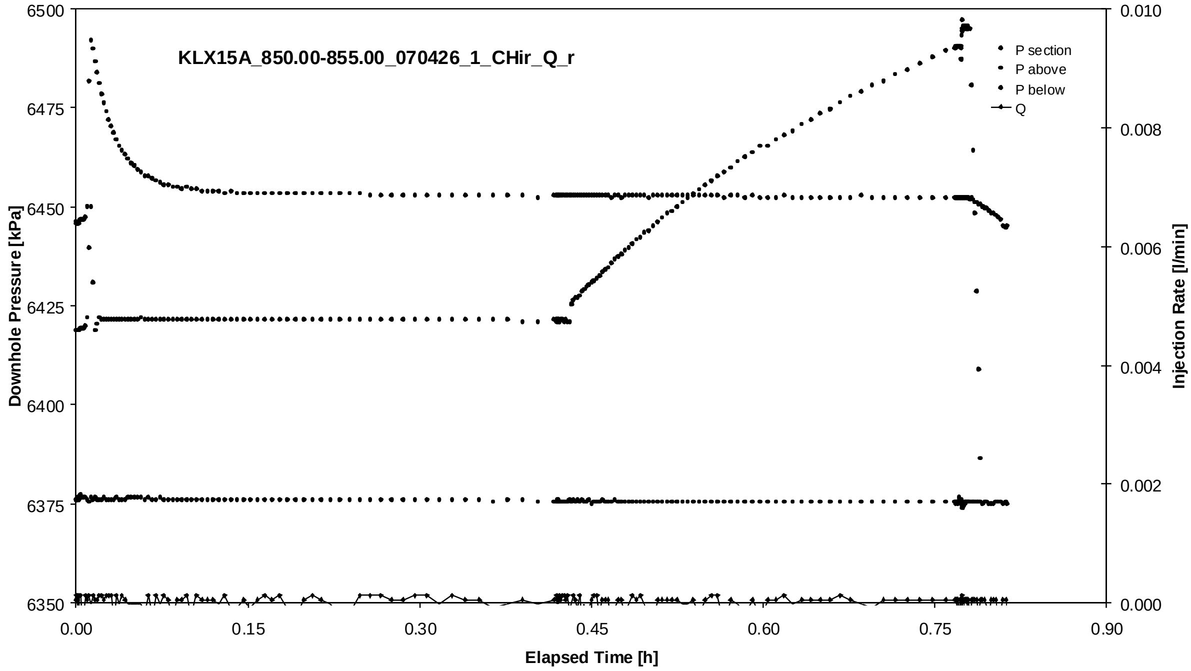


CHIR phase; HORNER match

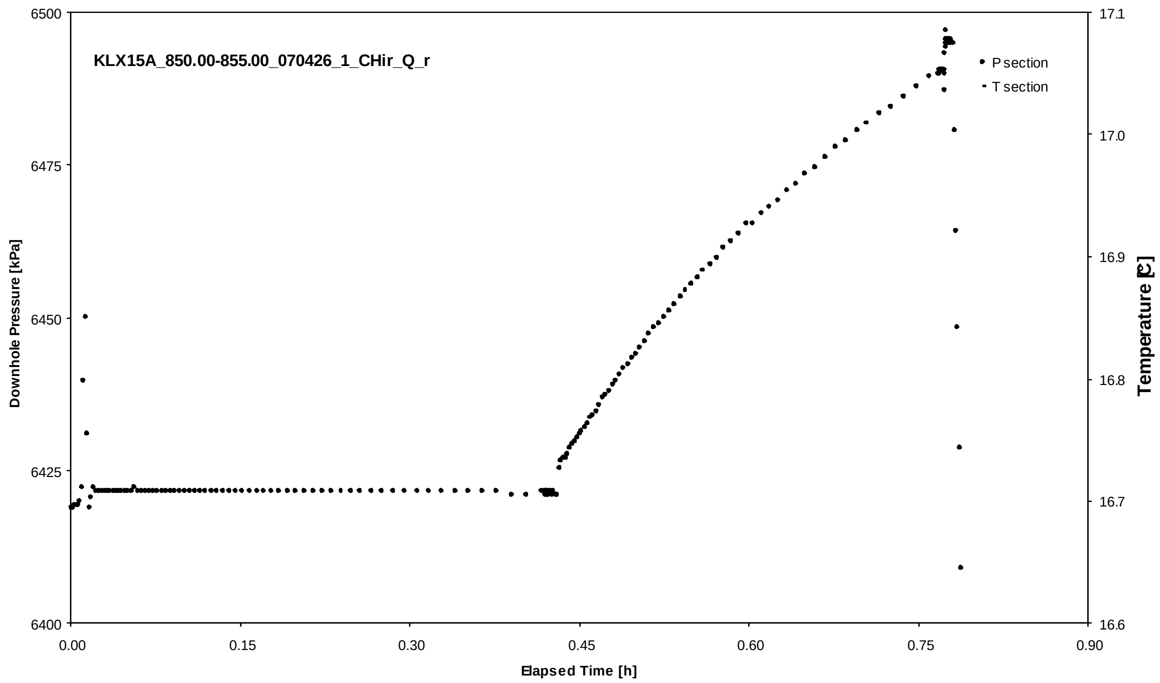
APPENDIX 2-109

Test 850.00 – 855.00 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

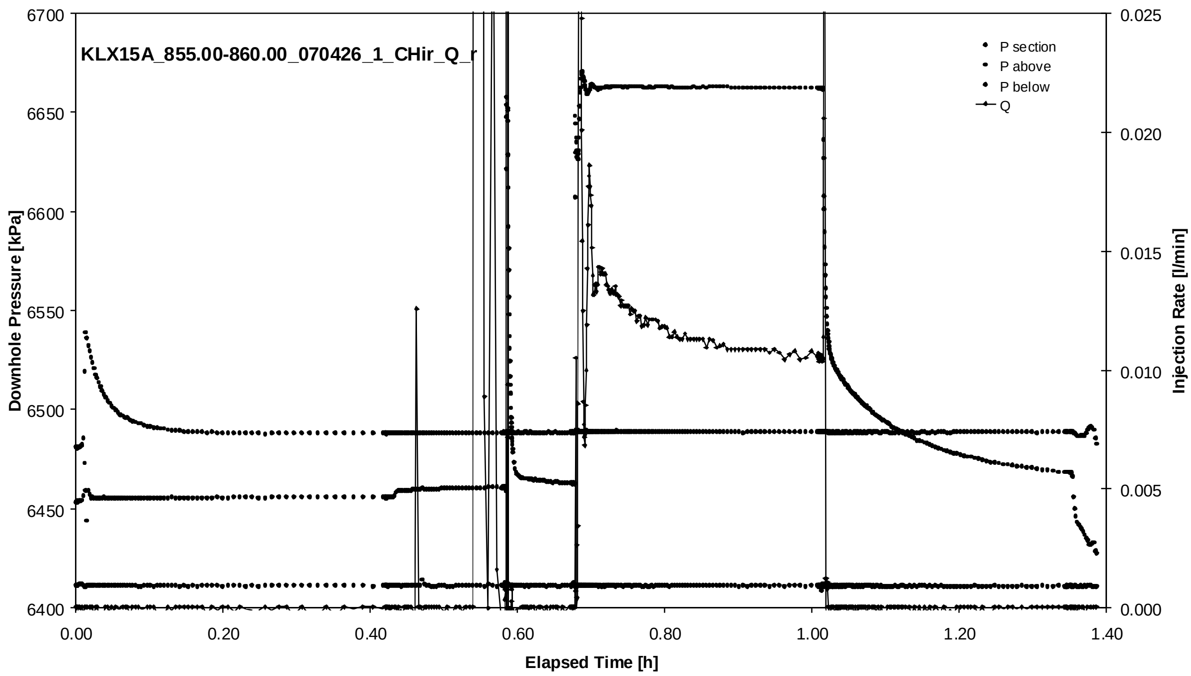
Not analysed

CHIR phase; HORNER match

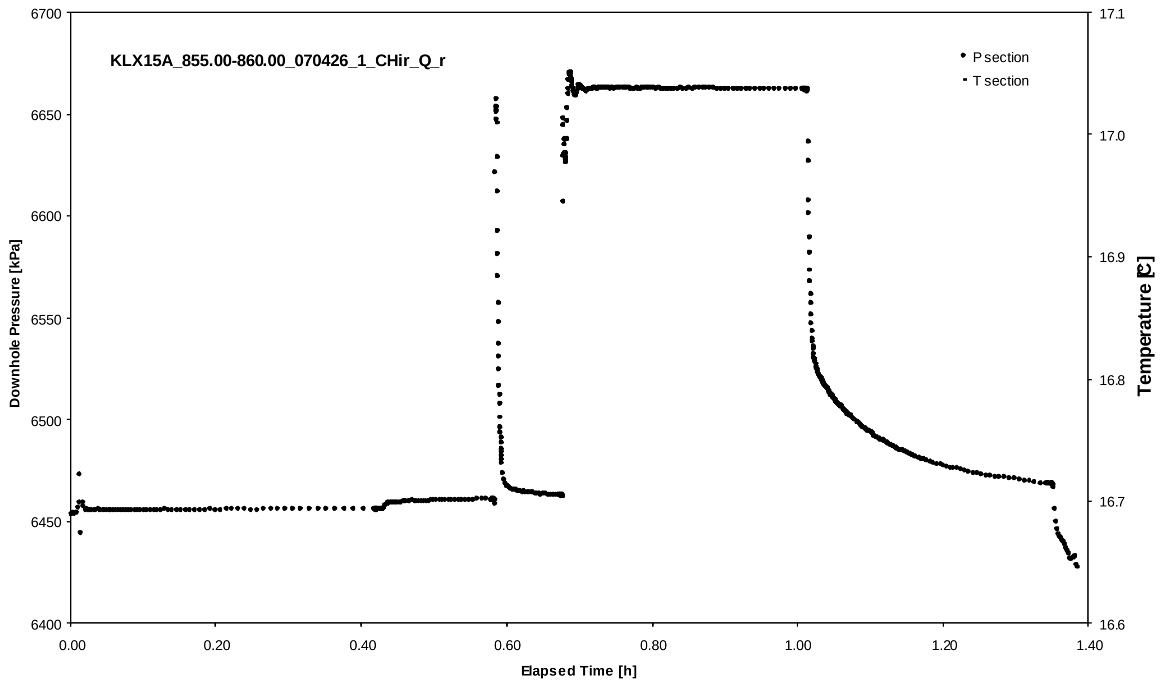
APPENDIX 2-110

Test 855.00 – 860.00 m

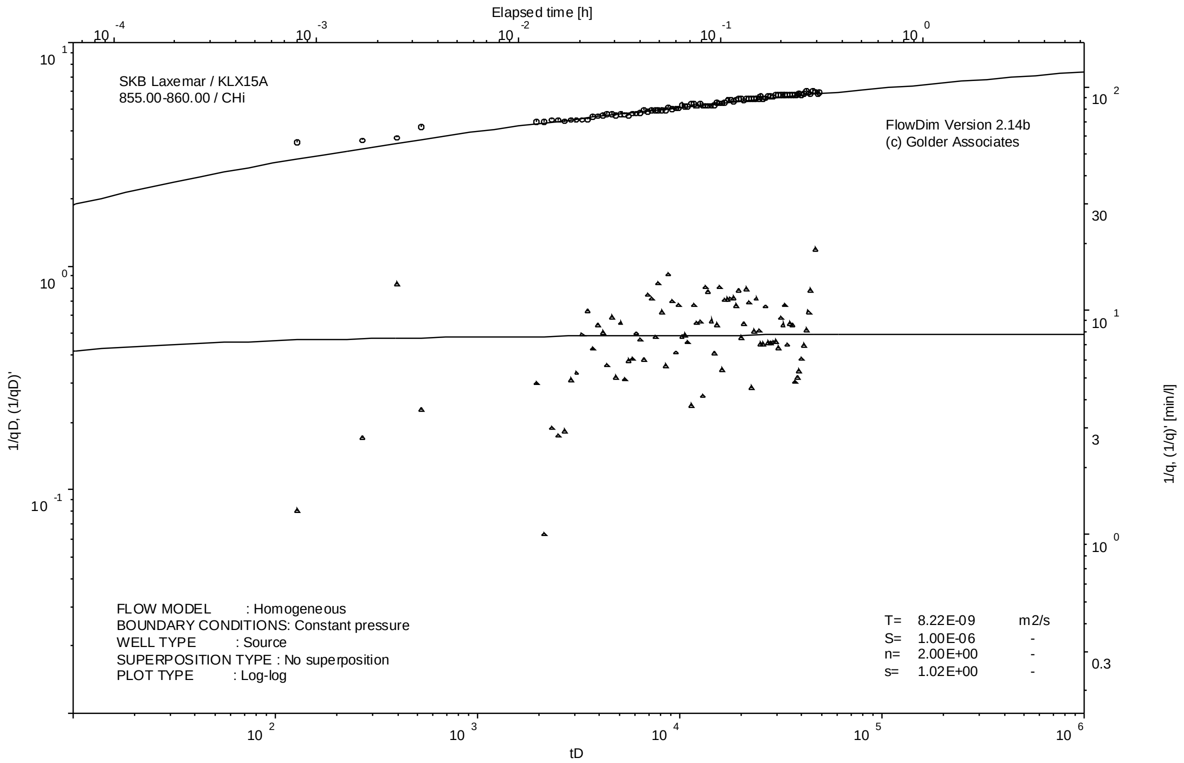
Analysis diagrams



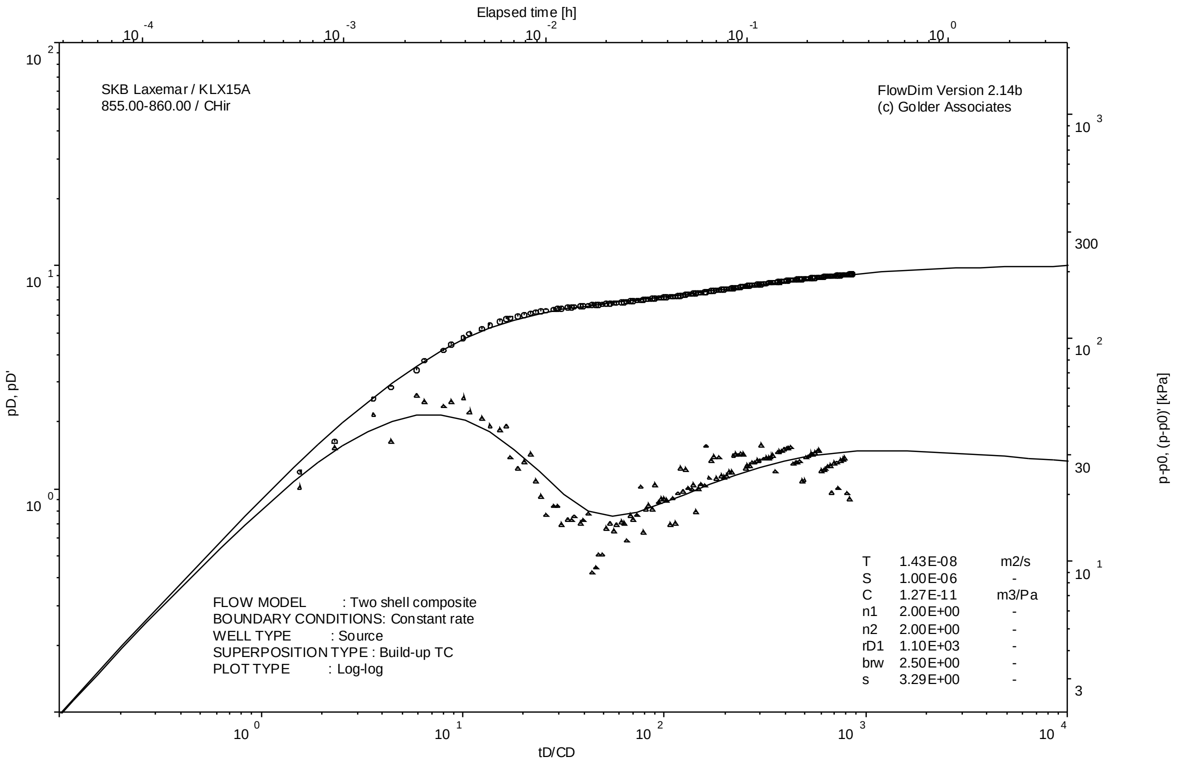
Pressure and flow rate vs. time; cartesian plot



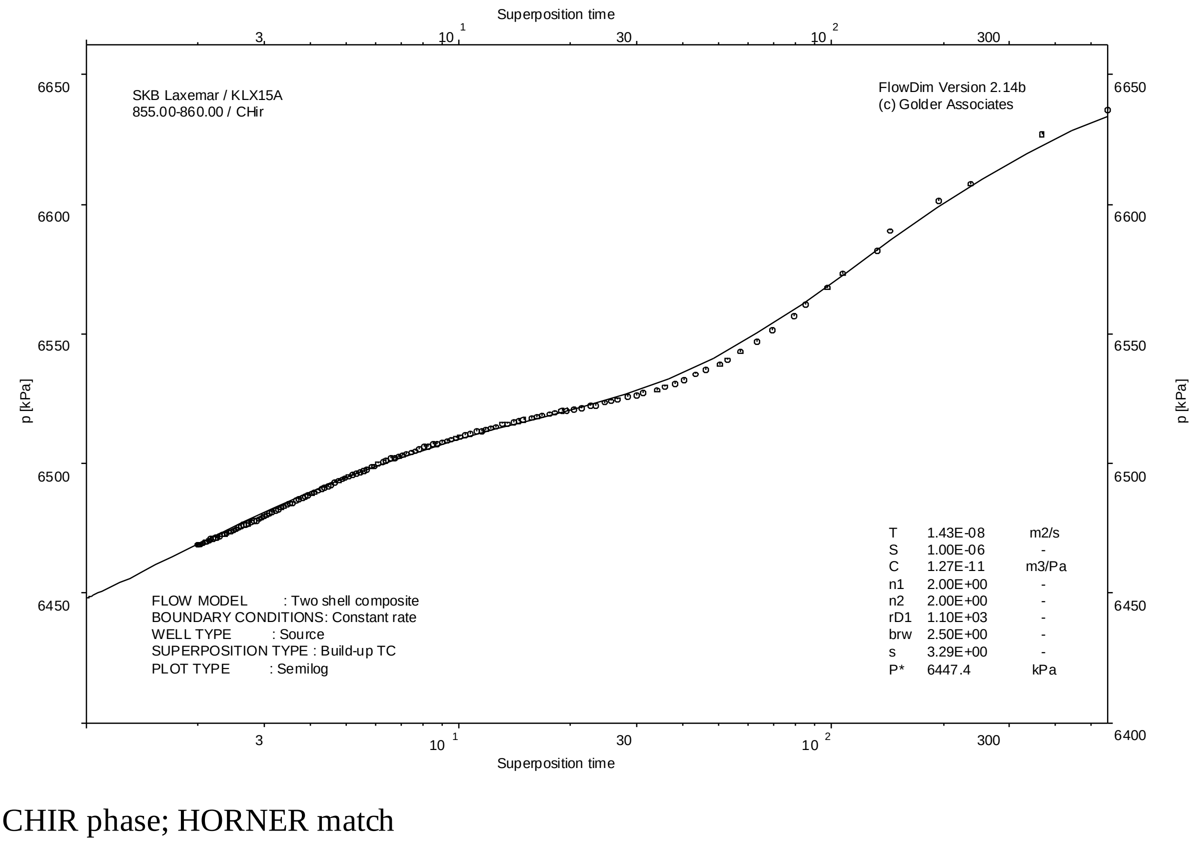
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

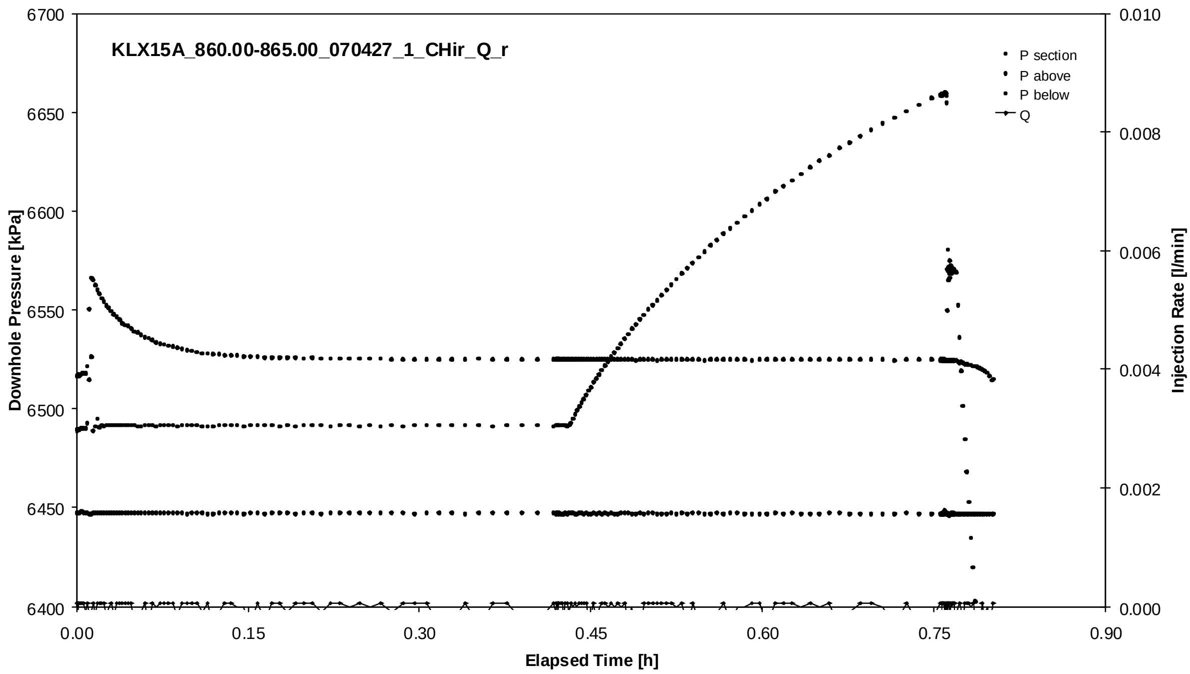


CHIR phase; HORNER match

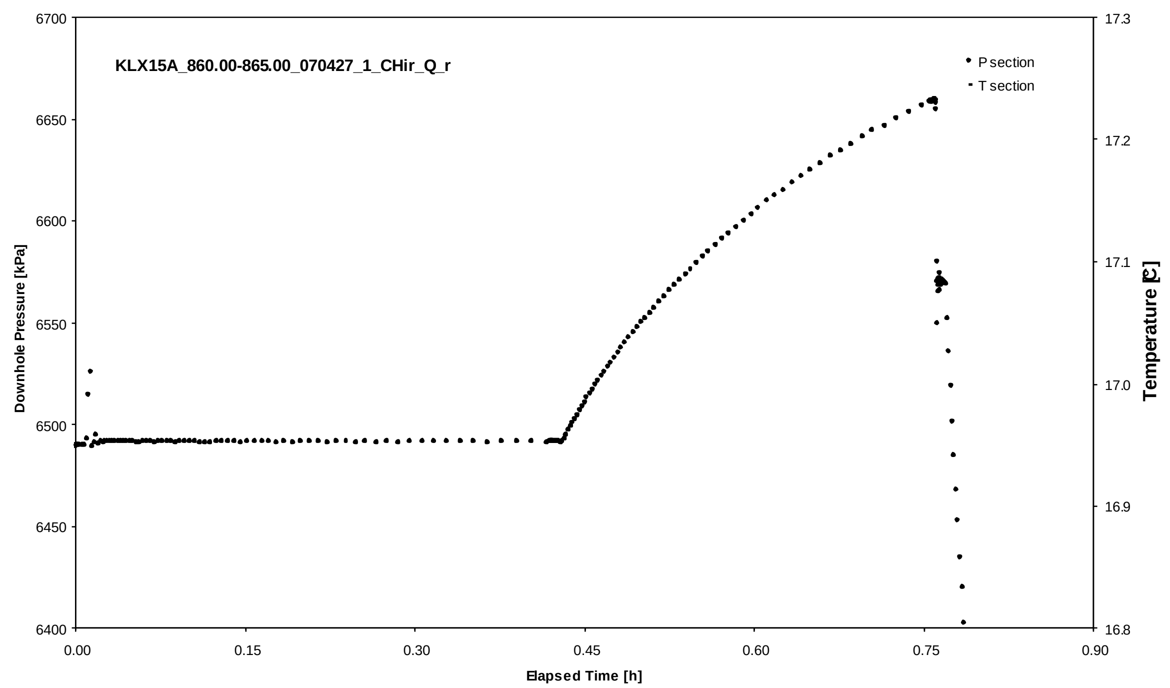
APPENDIX 2-111

Test 860.00 – 865.00 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

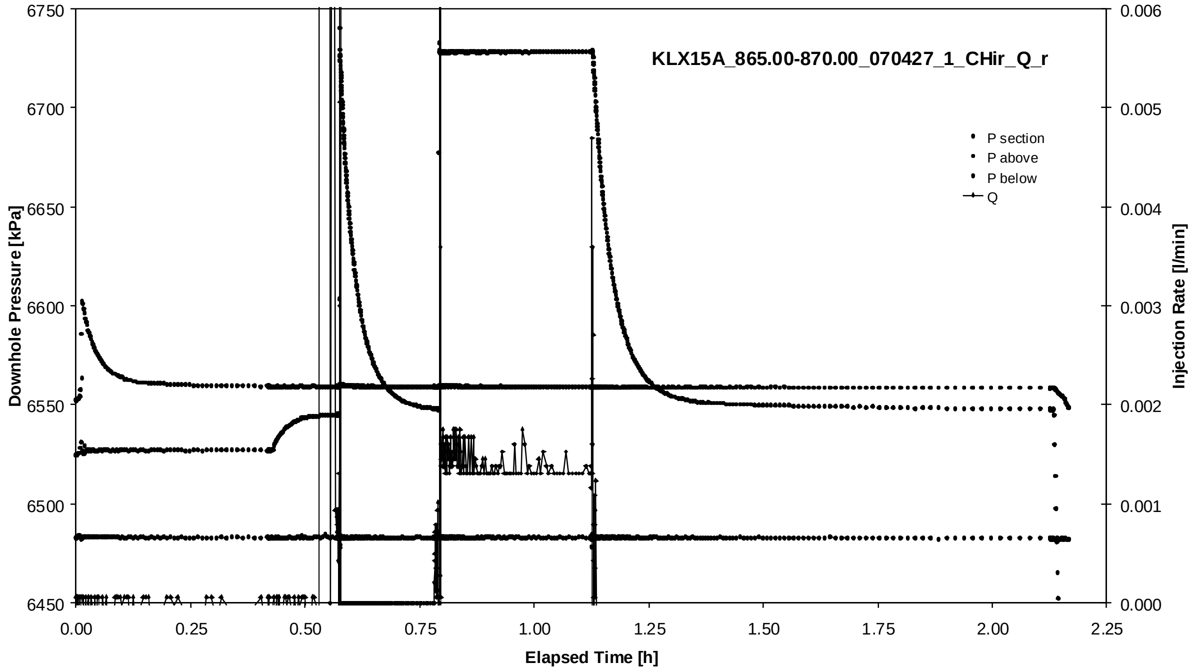
Not analysed

CHIR phase; HORNER match

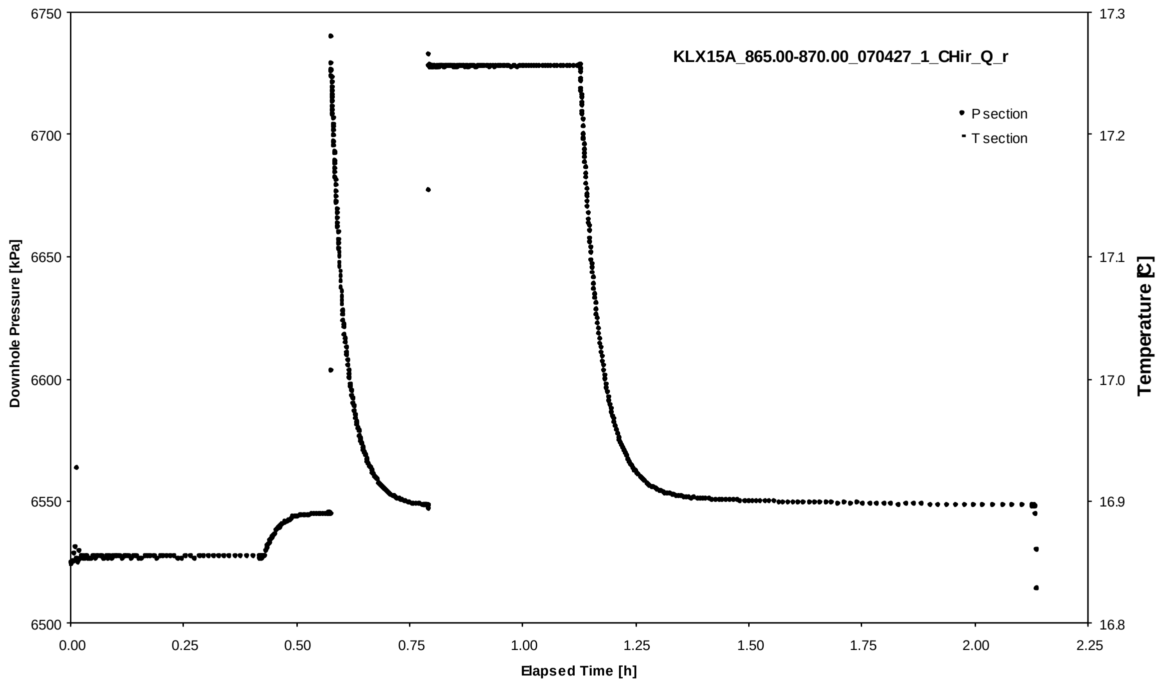
APPENDIX 2-112

Test 865.00 – 870.00 m

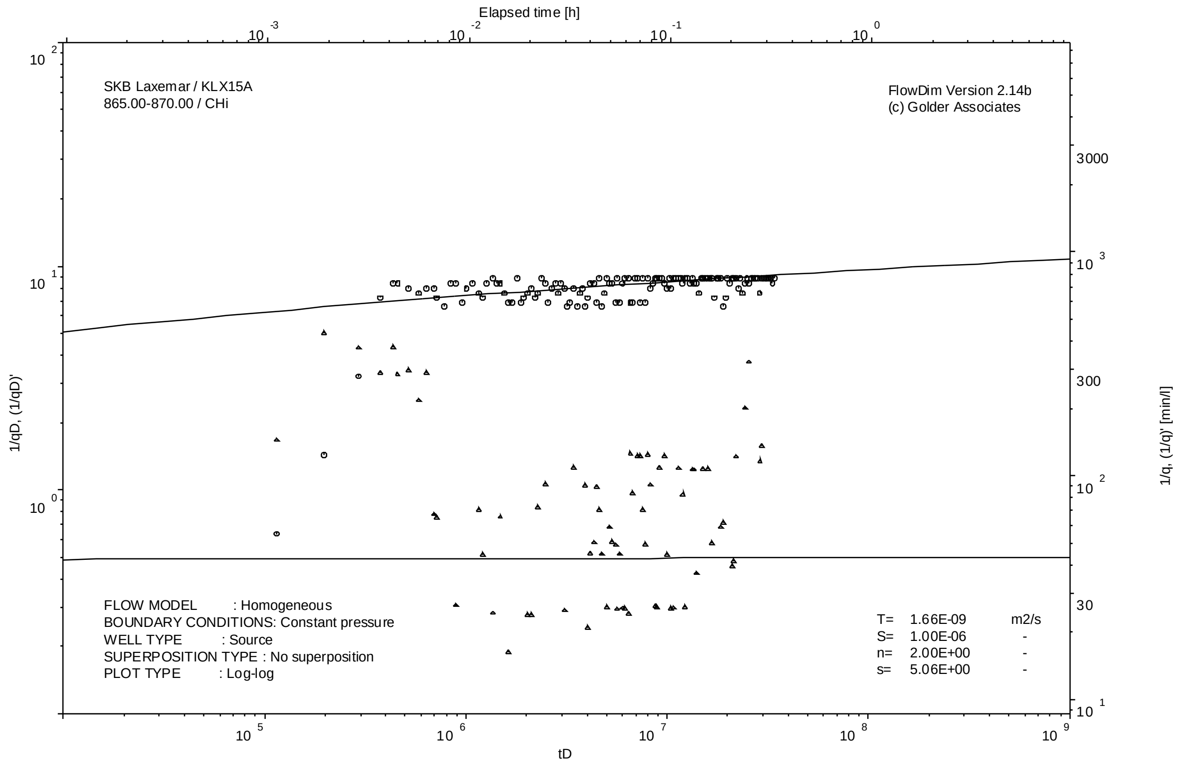
Analysis diagrams



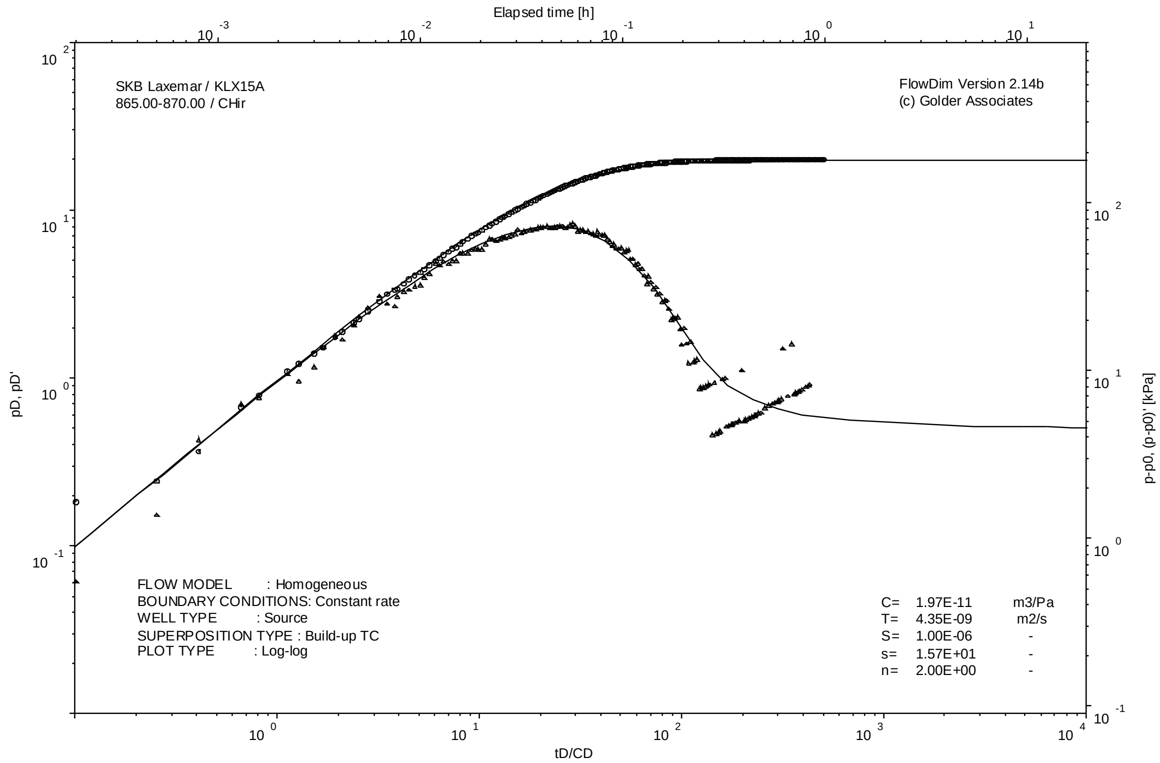
Pressure and flow rate vs. time; cartesian plot



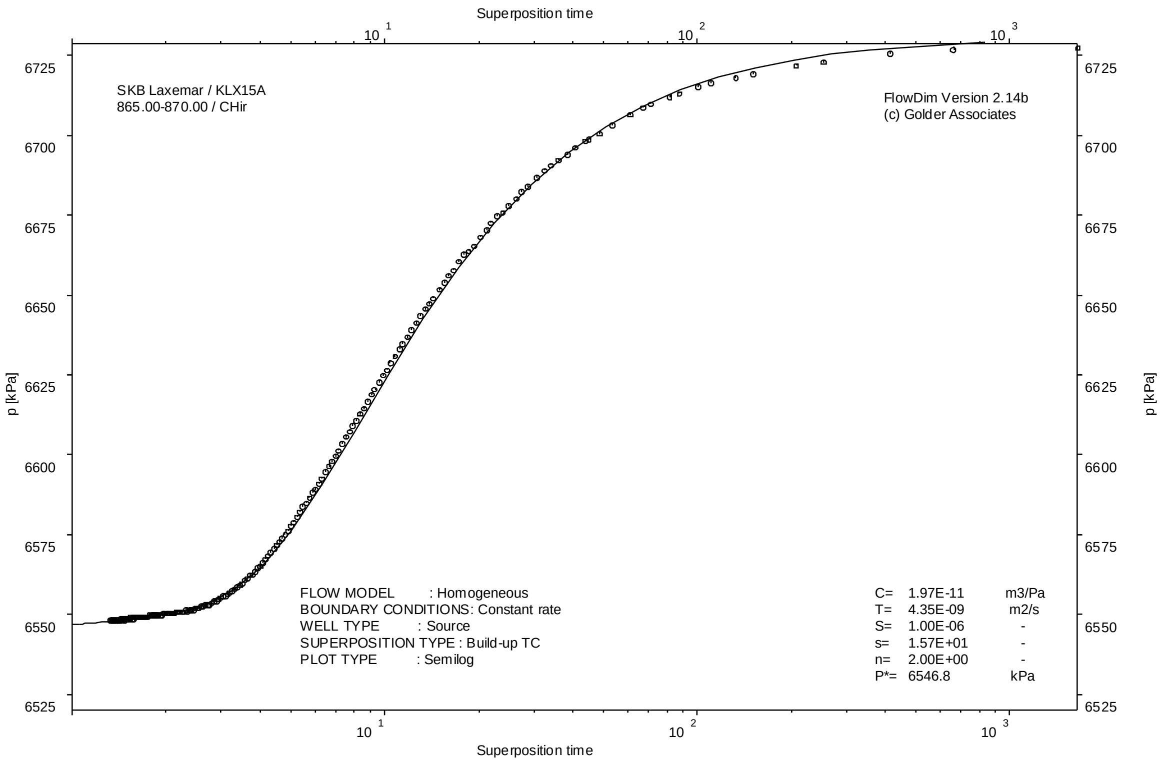
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

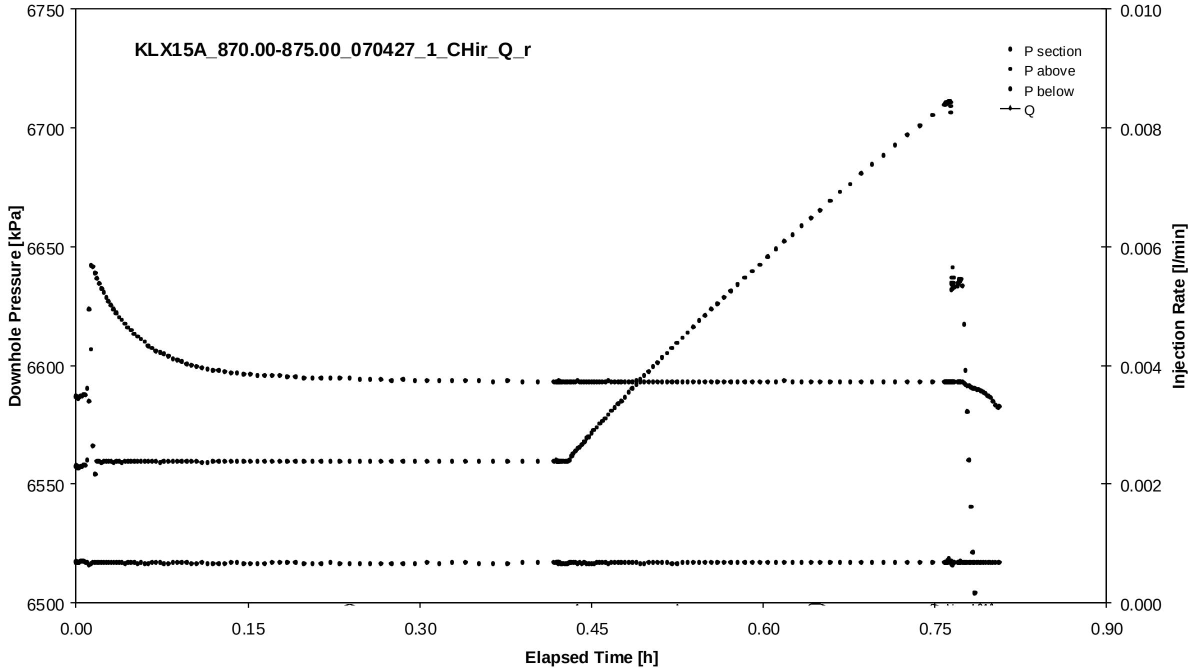


CHIR phase; HORNER match

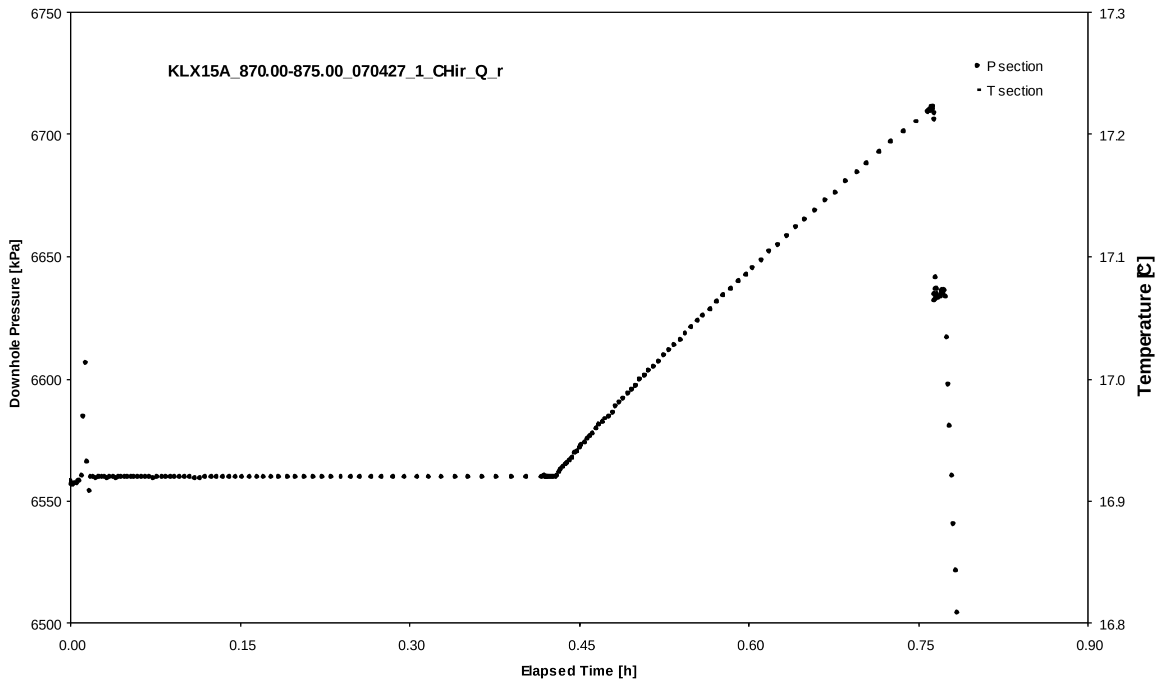
APPENDIX 2-113

Test 870.00 – 875.00 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

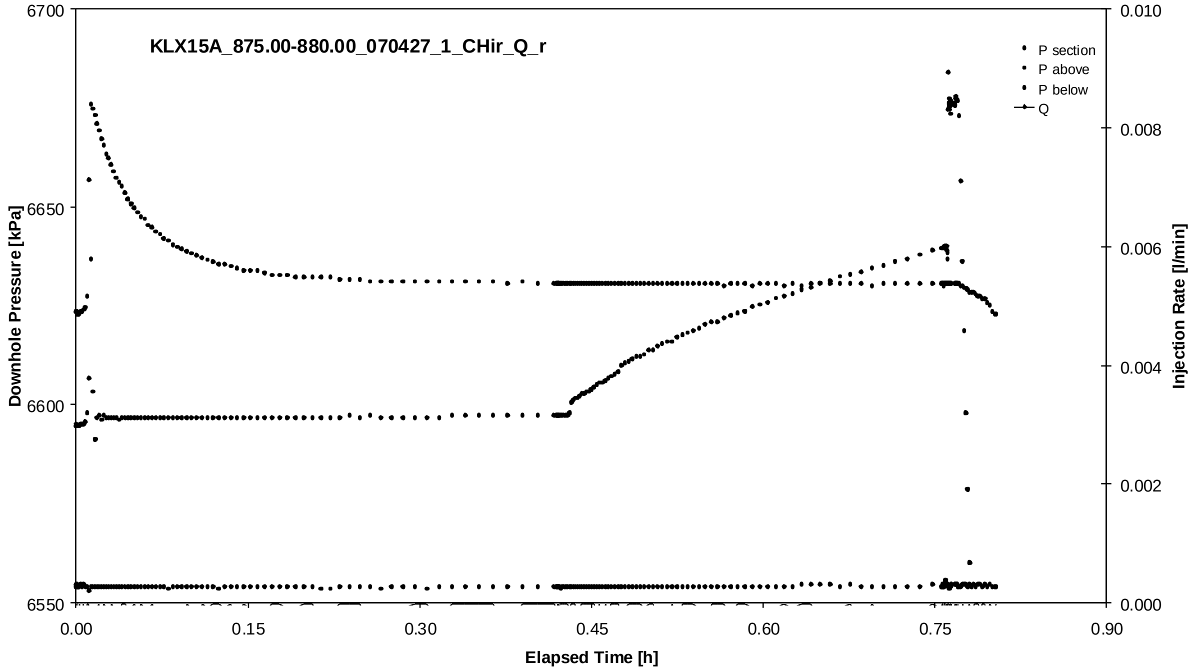
Not analysed

CHIR phase; HORNER match

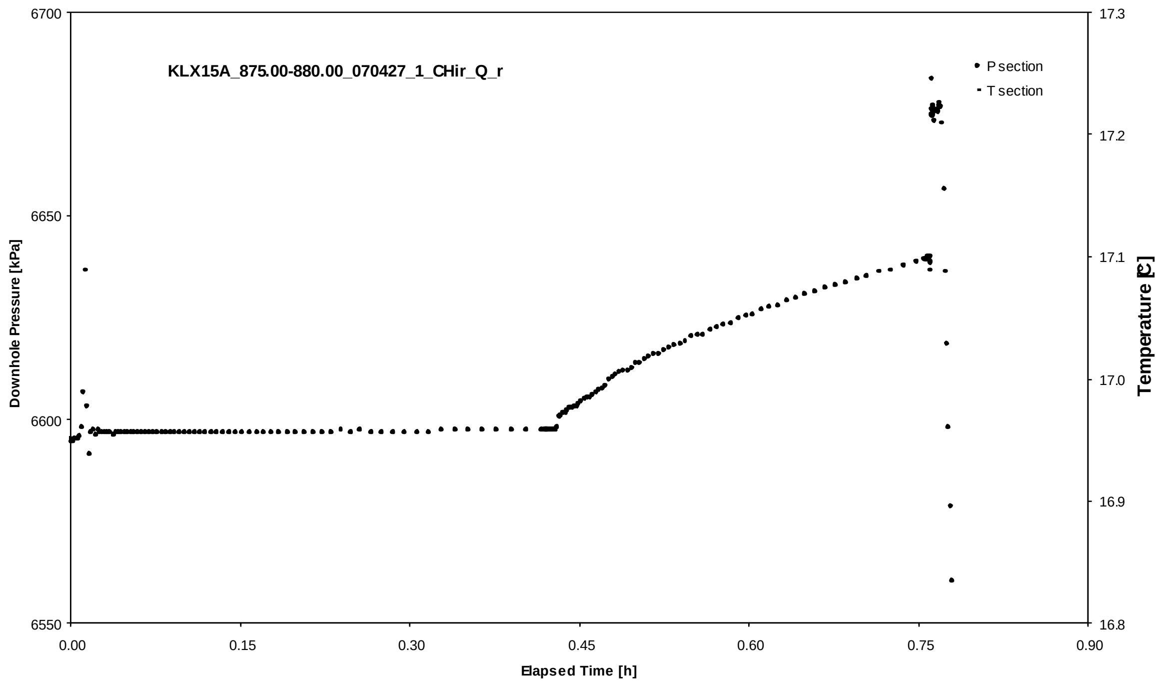
APPENDIX 2-114

Test 875.00 – 880.00 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

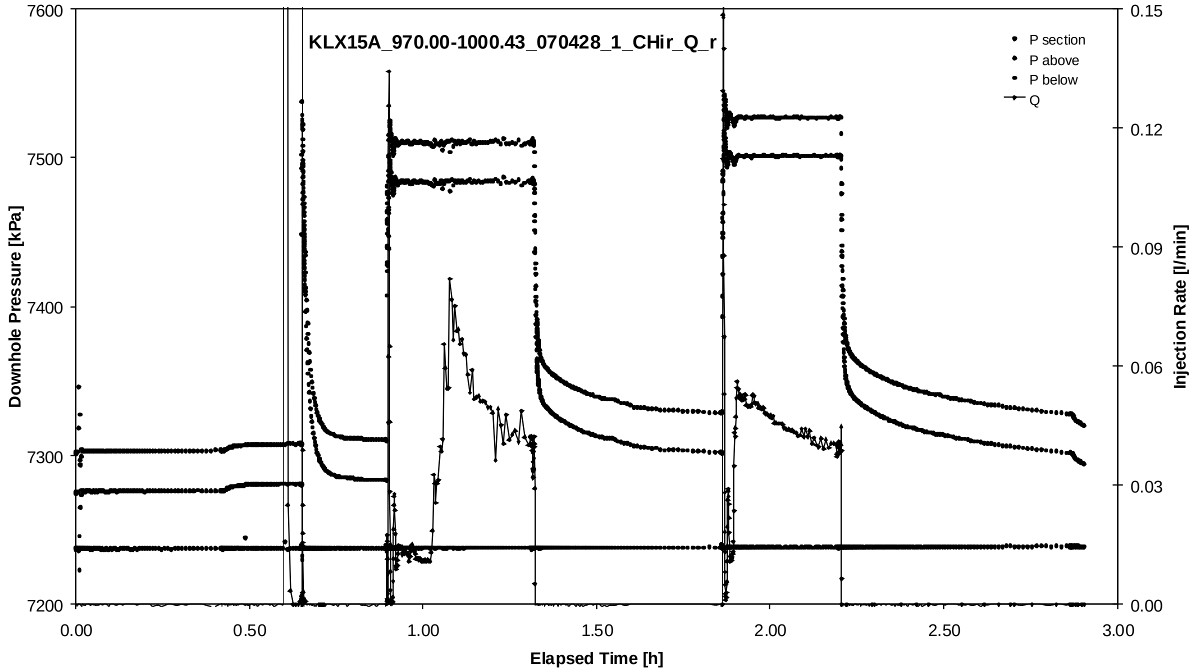
Not analysed

CHIR phase; HORNER match

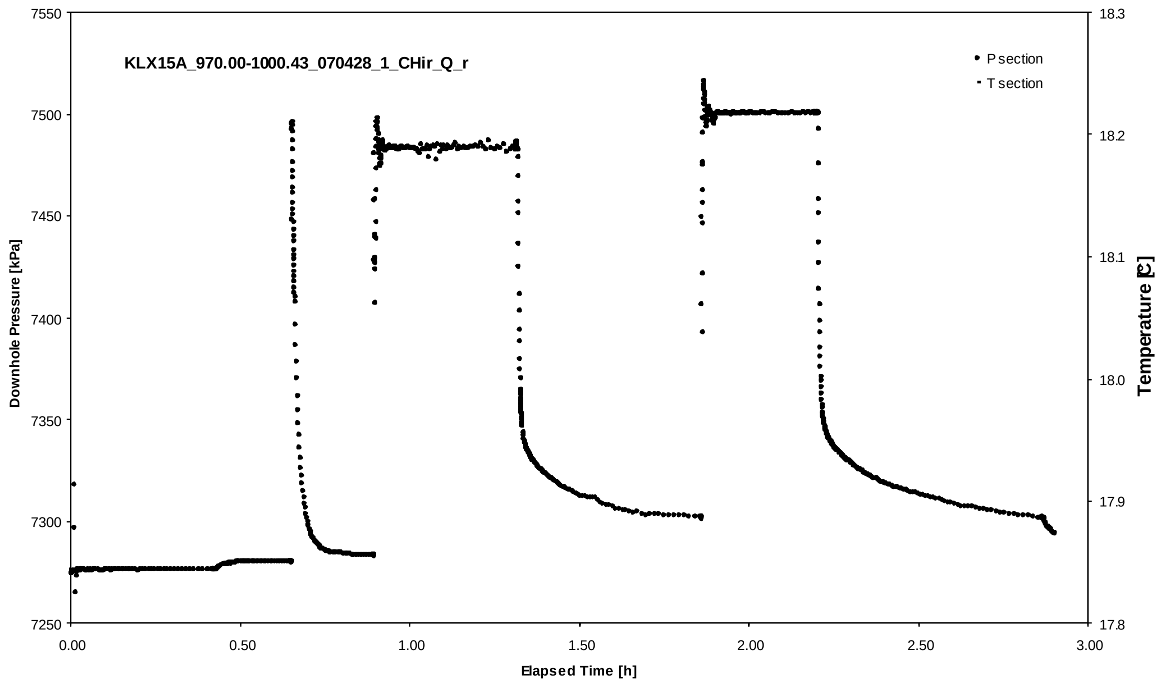
APPENDIX 2-115

Test 970.00 – 1000.43 m

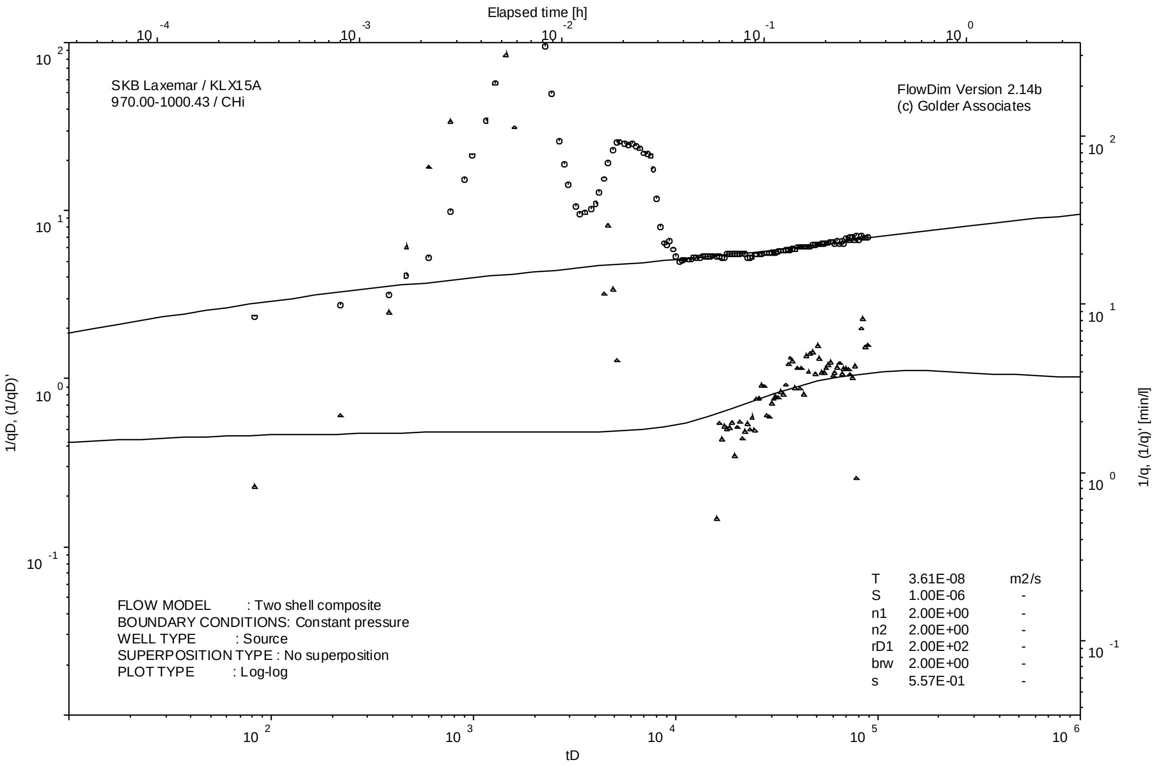
Analysis diagrams



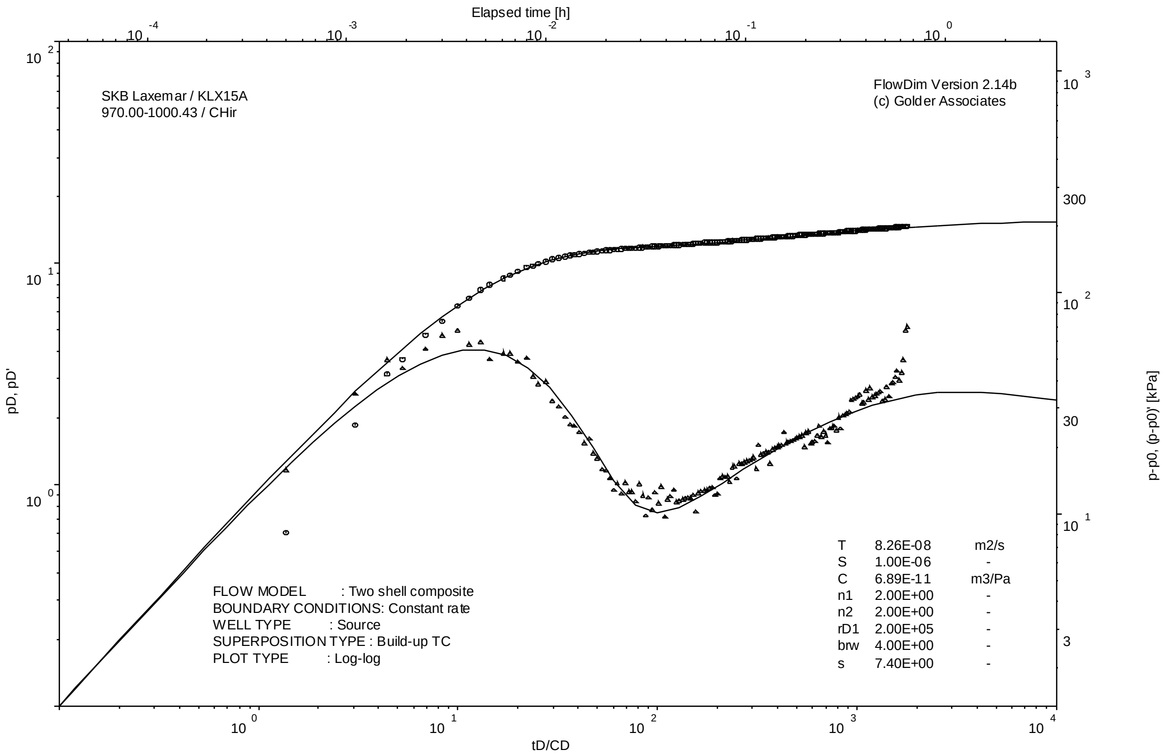
Pressure and flow rate vs. time; cartesian plot



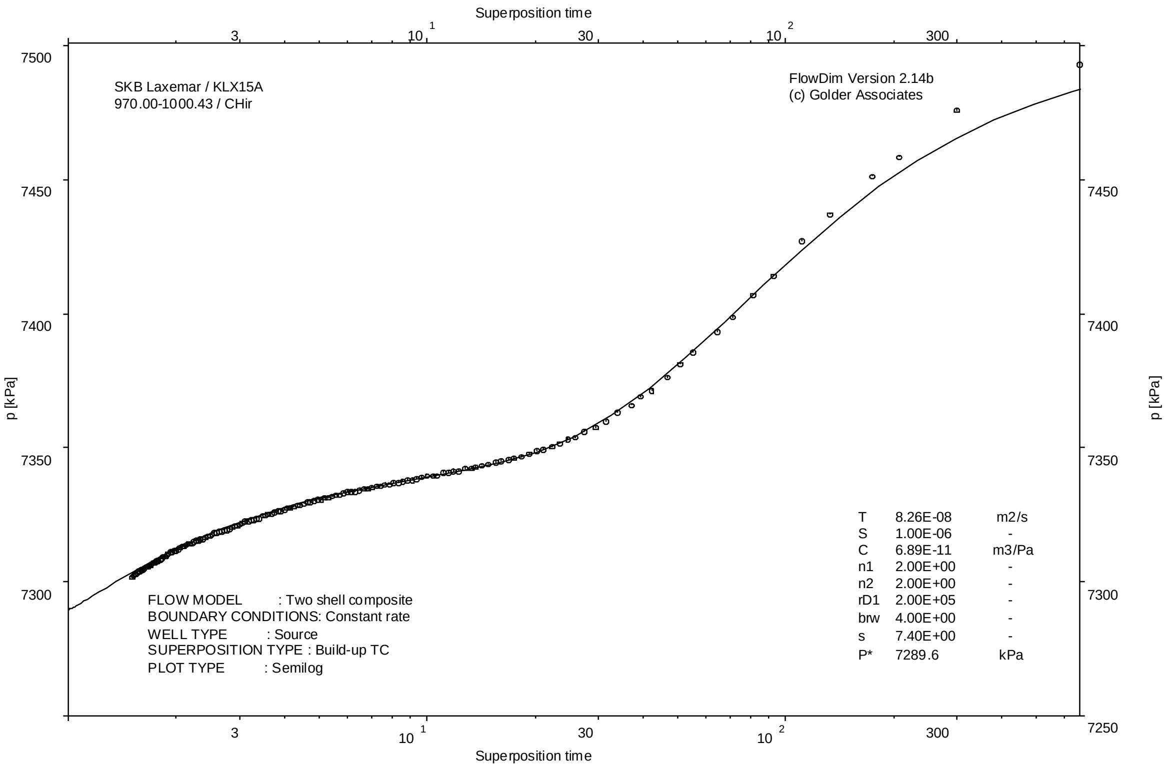
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

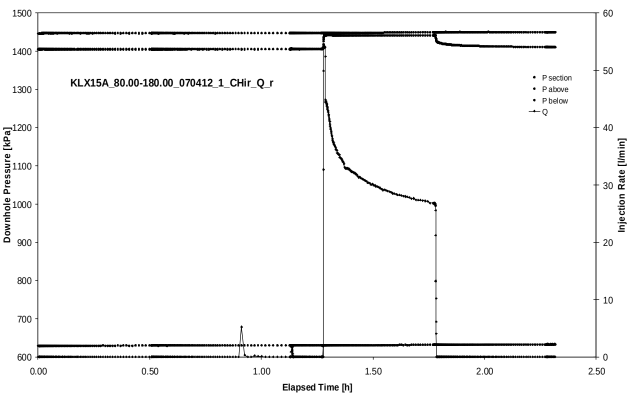
APPENDIX 3

Test Summary Sheets

Test Summary Sheet

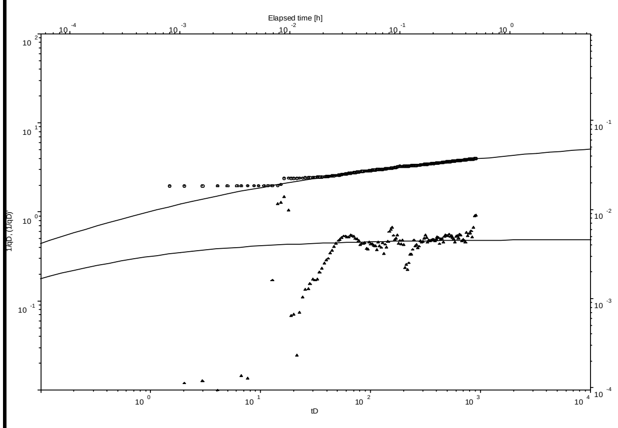
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070412 07:48
Test section from - to (m):	80.00-180.00 m	Responsible for test execution:	Stephan Rohs Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

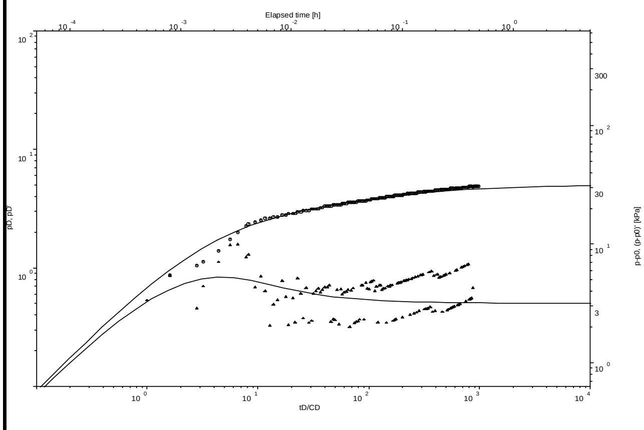


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	1405		
p_i (kPa) =	1405		
p_p(kPa) =	1441	p_F (kPa) =	1411
Q_p (m^3/s)=	4.42E-04		
tp (s) =	1800	t_F (s) =	1800
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	8.8		
Derivative fact.=	0.06	Derivative fact.=	0.07
Results		**Results**	
Q/s (m^2/s)=	1.2E-04		
T_M (m^2/s)=	1.6E-04		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	3.05	dt_1 (min) =	0.85
dt_2 (min) =	22.79	dt_2 (min) =	17.65
T (m^2/s) =	7.7E-05	T (m^2/s) =	1.3E-04
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	7.7E-07	K_s (m/s) =	1.3E-06
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.5E-07
C_D (-) =	NA	C_D (-) =	1.6E+01
ξ (-) =	-5.8	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) =	3.05	C (m^3/Pa) =	1.5E-07
dt_2 (min) =	22.79	C_D (-) =	1.6E+01
T_T (m^2/s) =	7.7E-05	ξ (-) =	-5.8
S (-) =	1.0E-06		
K_s (m/s) =	7.7E-07		
S_s (1/m) =	1.0E-08		

Comments:

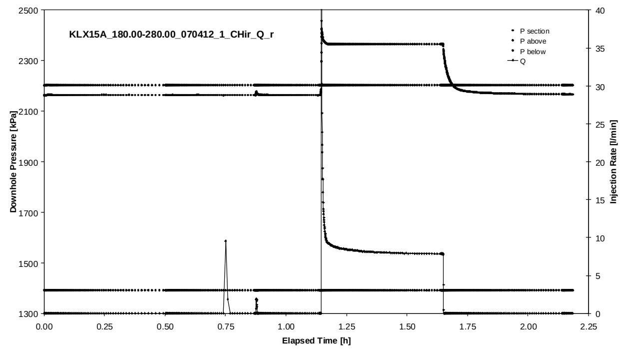
The recommended transmissivity of 7.7•E-05 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3.0•E-05 m2/s to 3.0•E-04 m2/s. The flow dimension displayed during the test was 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 1,407.6 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

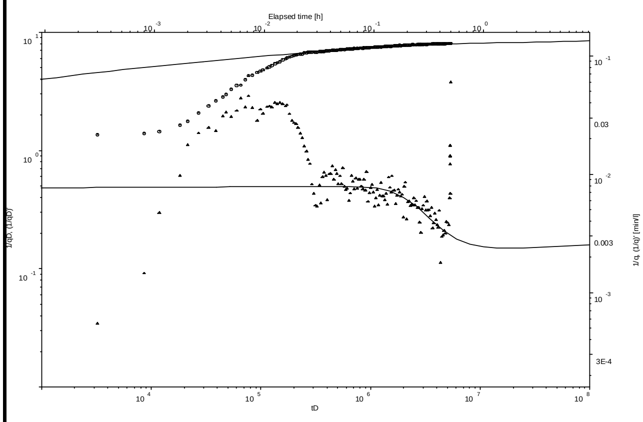
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070412 13:56
Test section from - to (m):	180-280 m	Responsible for test execution:	Stephan Rohs Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

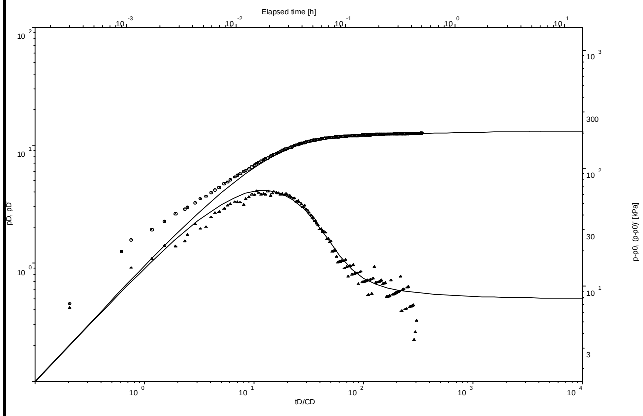


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2164		
p_i (kPa) =	2164		
p_p(kPa) =	2365	p_F (kPa) =	2166
Q_p (m^3/s)=	1.28E-04		
tp (s) =	1800	t_F (s) =	1800
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	10.0		
Derivative fact.=	0.06	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	6.3E-06		
T_M (m^2/s)=	8.2E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	#NV	dt_1 (min) =	9.25
dt_2 (min) =	#NV	dt_2 (min) =	21.12
T (m^2/s) =	2.4E-05	T (m^2/s) =	1.4E-05
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.4E-07	K_s (m/s) =	1.4E-07
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	4.8E-08
C_D (-) =	NA	C_D (-) =	5.3E+00
ξ (-) =	-0.3	ξ (-) =	4.1
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



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	9.25	C (m^3/Pa) =	4.8E-08
dt_2 (min) =	21.12	C_D (-) =	5.3E+00
T_T (m^2/s) =	1.4E-05	ξ (-) =	4.1
S (-) =	1.0E-06		
K_s (m/s) =	1.4E-07		
S_s (1/m) =	1.0E-08		

Comments:

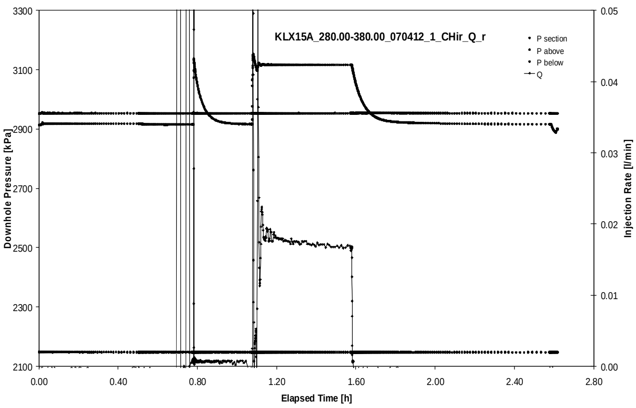
The recommended transmissivity of 1.4•E-05 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5.0•E-06 m2/s to 3.0•E-05 m2/s. The flow dimension displayed during the test was 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 2,157.8 kPa.

[1] According to SKB MD 320.004 appendix 3.

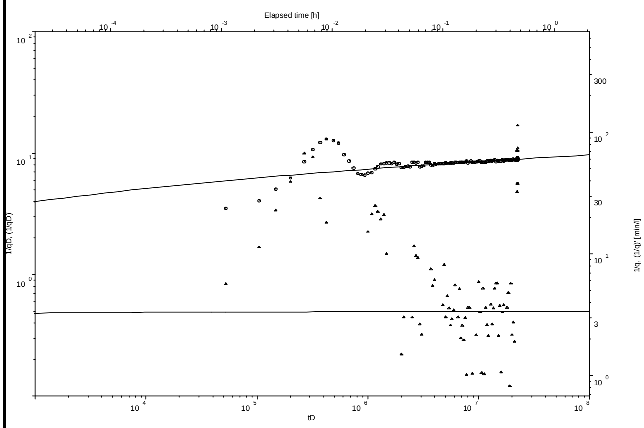
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070412 17:54
Test section from - to (m):	280.00-380.00 m	Responsible for test execution:	Stephan Rohs Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

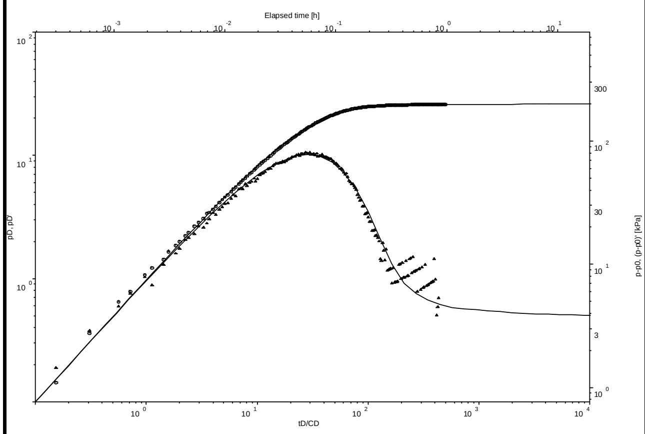
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2913		
p_i (kPa) =	2917		
p_p(kPa) =	3116	p_F (kPa) =	2917
Q_p (m^3/s)=	2.83E-07		
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)=	11.1		
Derivative fact.=	0.05	Derivative fact.=	0.07
Results		**Results**	
Q/s (m^2/s)=	1.4E-08		
T_M (m^2/s)=	1.8E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	3.11	dt_1 (min) =	#NV
dt_2 (min) =	23.20	dt_2 (min) =	#NV
T (m^2/s) =	1.9E-08	T (m^2/s) =	6.0E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.9E-10	K_s (m/s) =	6.0E-10
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.7E-10
C_D (-) =	NA	C_D (-) =	3.0E-02
ξ (-) =	3.5	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) =	3.11	C (m^3/Pa) =	2.7E-10
dt_2 (min) =	23.20	C_D (-) =	3.0E-02
T_T (m^2/s) =	1.9E-08	ξ (-) =	3.5
S (-) =	1.0E-06		
K_s (m/s) =	1.9E-10		
S_s (1/m) =	1.0E-08		

Comments:

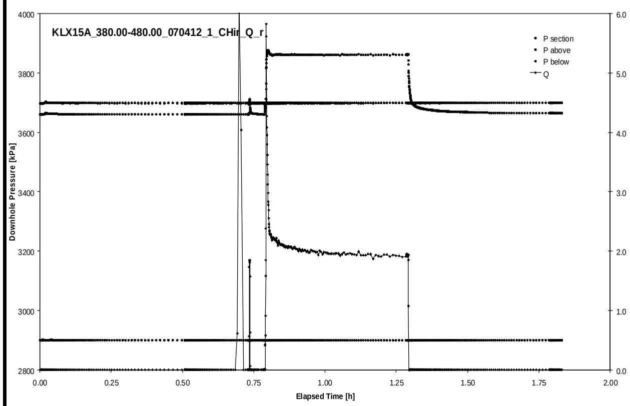
The recommended transmissivity of 1.9•E-8 m2/s was derived from the analysis of the CHi phase, which shows a horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be 5.0•E-9 m2/s to 6.0•E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,916.3 kPa.

[1] According to SKB MD 320.004 appendix 3.

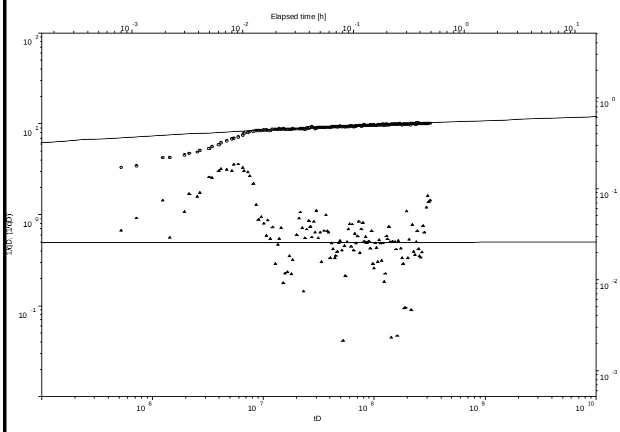
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070412 22:07
Test section from - to (m):	380.00-480.00 m	Responsible for test execution:	Stephan Rohs Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

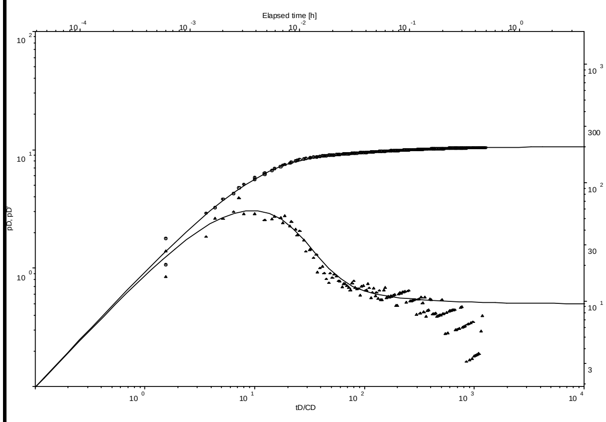
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3660		
p_i (kPa) =	3661		
p_p(kPa) =	3862	p_F (kPa) =	3665
Q_p (m^3/s)=	3.20E-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)=	12.3		
Derivative fact.=	0.09	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	1.6E-06		
T_M (m^2/s)=	2.0E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.22	dt_1 (min) =	2.15
dt_2 (min) =	22.71	dt_2 (min) =	8.98
T (m^2/s) =	2.5E-06	T (m^2/s) =	2.8E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.5E-08	K_s (m/s) =	2.8E-08
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.5E-09
C_D (-) =	NA	C_D (-) =	2.8E-01
ξ (-) =	2.3	ξ (-) =	3.0
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) =	2.15	C (m^3/Pa) =	2.5E-09
dt_2 (min) =	8.98	C_D (-) =	2.8E-01
T_T (m^2/s) =	2.8E-06	ξ (-) =	3.0
S (-) =	1.0E-06		
K_s (m/s) =	2.8E-08		
S_s (1/m) =	1.0E-08		

Comments:

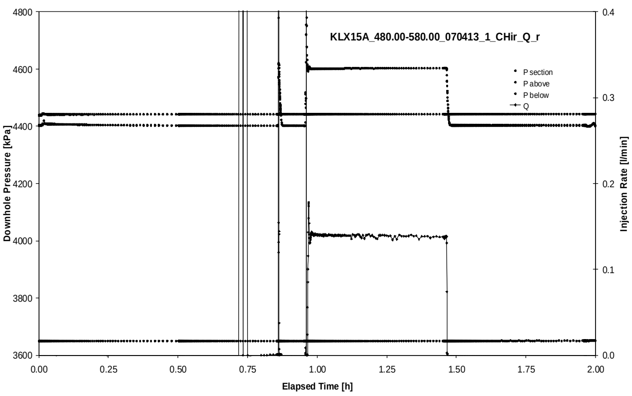
The recommended transmissivity of 2.8•E-6 m²/s was derived from the analysis of the CHir phase, because it shows the best derivative stabilisation. The confidence range for the interval transmissivity is estimated to be 8.0•E-5 m²/s to 5.0•E-6 m²/s. The flow dimension displayed during the test is 2. 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 3,657.5 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

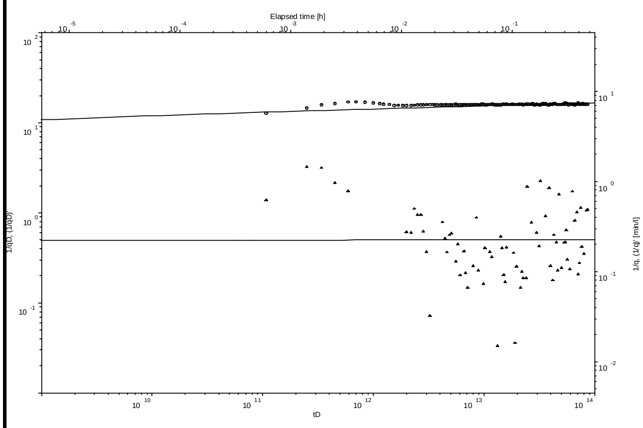
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070413 06:20
Test section from - to (m):	480.00-580.00 m	Responsible for test execution:	Stephan Rohs Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

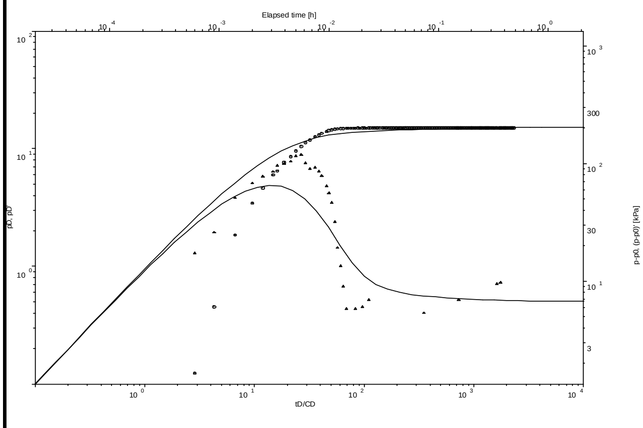


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4403		
p_i (kPa) =	4401		
p_p(kPa) =	4602	p_F (kPa) =	4403
Q_p (m^3/s)=	2.28E-06		
tp (s) =	1800	t_F (s) =	1800
S el S* (-)=	1.00E-06	S el S* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.9		
Derivative fact.=	0.04	Derivative fact.=	0.01
Results		**Results**	
Q/s (m^2/s)=	1.1E-07		
T_M (m^2/s)=	1.5E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.11	dt_1 (min) =	#NV
dt_2 (min) =	23.06	dt_2 (min) =	#NV
T (m^2/s) =	2.9E-07	T (m^2/s) =	2.7E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.9E-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) =	1.3E-10
C_D (-) =	NA	C_D (-) =	1.4E-02
ξ (-) =	9.7	ξ (-) =	9.0
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) =	1.11	C (m^3/Pa) =	1.3E-10
dt_2 (min) =	23.06	C_D (-) =	1.4E-02
T_T (m^2/s) =	2.9E-07	ξ (-) =	9.7
S (-) =	1.0E-06		
K_s (m/s) =	2.9E-09		
S_s (1/m) =	1.0E-08		

Comments:

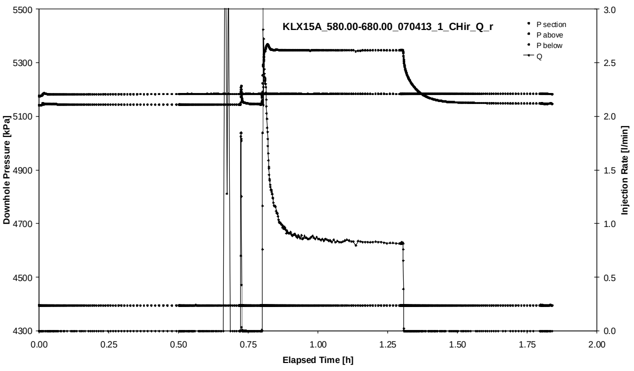
The recommended transmissivity of 2.9•E-7 m2/s was derived from the analysis of the CHi phase, which shows the slight better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3.0•E-8 m2/s to 7.0•E-7 m2/s. The flow dimension is assumed to be 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,403.1 kPa.

[1] According to SKB MD 320.004 appendix 3.

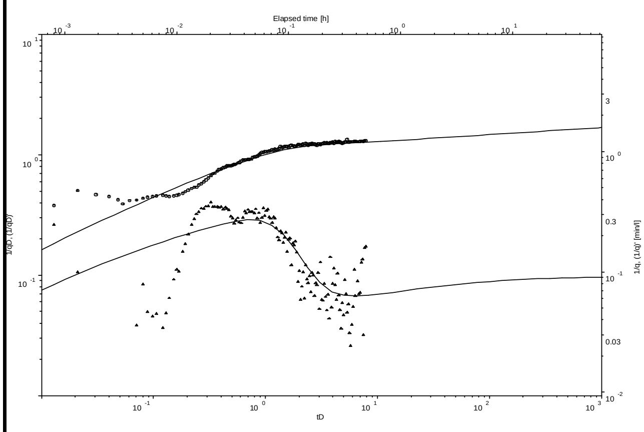
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070413 10:28
Test section from - to (m):	580.00-680.00 m	Responsible for test execution:	Stephan Rohs Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

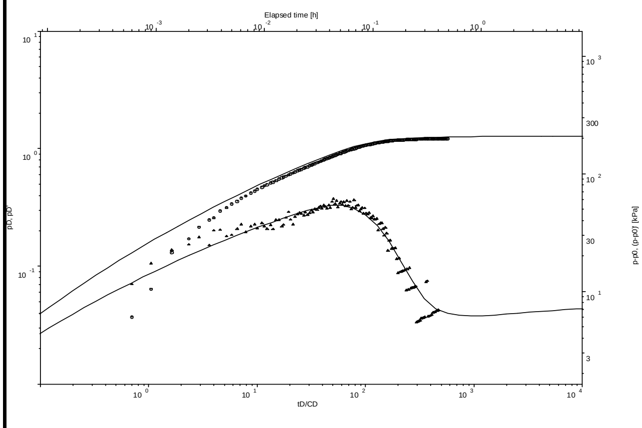
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5142		
p_i (kPa) =	5148		
p_p(kPa) =	5345	p_F (kPa) =	5148
Q_p (m^3/s)=	1.36E-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)=	#NV		
Derivative fact.=	0.14	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	6.8E-07		
T_M (m^2/s)=	8.8E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	1.81
dt_2 (min) =	NA	dt_2 (min) =	4.43
T (m^2/s) =	1.4E-07	T (m^2/s) =	1.5E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.8E-08	K_s (m/s) =	3.0E-08
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.0E-10
C_D (-) =	NA	C_D (-) =	3.3E-02
ξ (-) =	-5.0	ξ (-) =	-4.6
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) =	1.81	C (m^3/Pa) =	3.0E-10
dt_2 (min) =	4.43	C_D (-) =	3.3E-02
T_T (m^2/s) =	1.5E-07	ξ (-) =	-4.6
S (-) =	1.0E-06		
K_s (m/s) =	3.0E-08		
S_s (1/m) =	1.0E-08		

Comments:

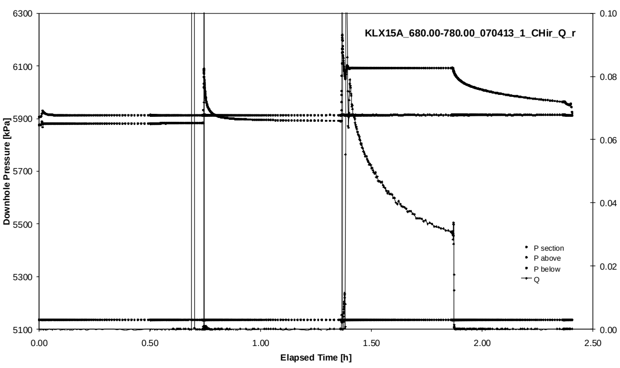
The recommended transmissivity of 1.5•E-7 m2/s was derived from the analysis of the CHir phase (inner zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0•E-7 m2/s to 3.0•E-6 m2/s. The flow dimension displayed during the test is 2. 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 5,145.1 kPa.

[1] According to SKB MD 320.004 appendix 3.

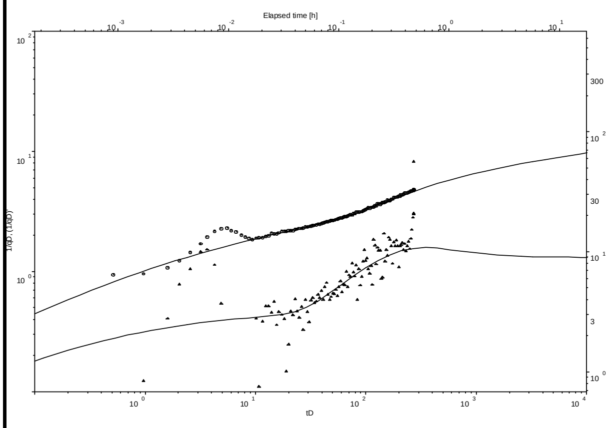
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070413 15:02
Test section from - to (m):	680.00-780.00 m	Responsible for test execution:	Stephan Rohs Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

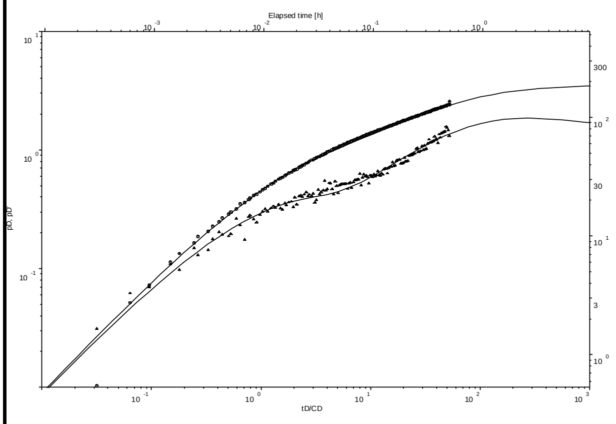
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5878		
p_i (kPa) =	5891		
p_p(kPa) =	6091	p_F (kPa) =	5964
Q_p (m^3/s)=	5.17E-07		
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)=	#NV		
Derivative fact.=	0.03	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	2.5E-08		
T_M (m^2/s)=	3.3E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	1.03
dt_2 (min) =	NA	dt_2 (min) =	3.41
T (m^2/s) =	1.9E-08	T (m^2/s) =	2.2E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.9E-10	K_s (m/s) =	2.2E-10
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.0E-10
C_D (-) =	NA	C_D (-) =	5.5E-02
ξ (-) =	-2.2	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) =	1.03	C (m^3/Pa) =	5.0E-10
dt_2 (min) =	3.41	C_D (-) =	5.5E-02
T_T (m^2/s) =	2.2E-08	ξ (-) =	-3.1
S (-) =	1.0E-06		
K_s (m/s) =	2.2E-10		
S_s (1/m) =	1.0E-08		

Comments:

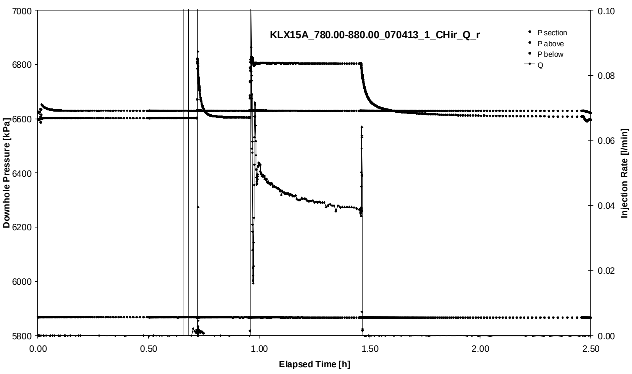
The recommended transmissivity of 2.2•E-8 m2/s was derived from the analysis of the CHir phase (inner zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5.0•E-9 m2/s to 5.0•E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, could not be extrapolated from the CHir phase due to the very low outer zone transmissivity.

[1] According to SKB MD 320.004 appendix 3.

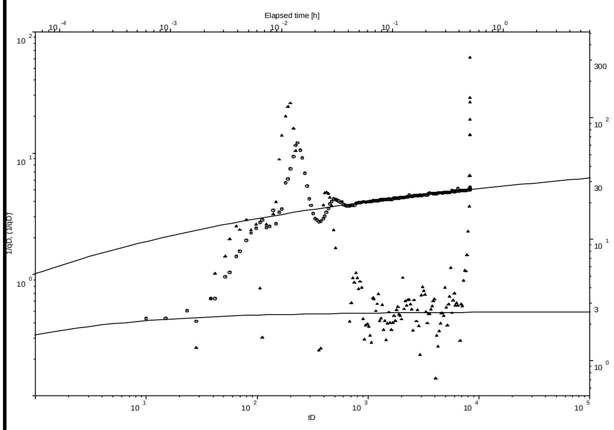
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070413 19:23
Test section from - to (m):	780.00-880.00 m	Responsible for test execution:	Stephan Rohs Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

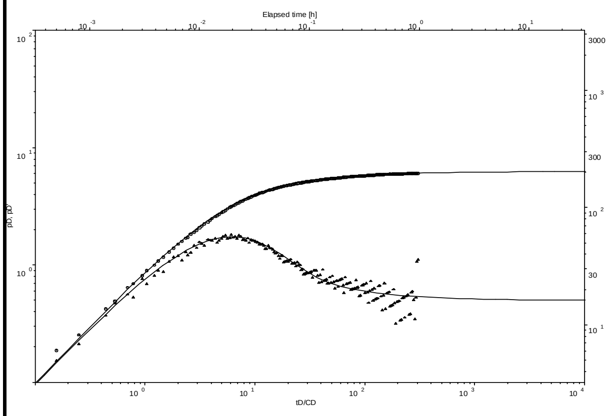
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	6596		
p_i (kPa) =	6605		
p_p(kPa) =	6801	p_F (kPa) =	6604
Q_p (m^3/s)=	6.50E-07		
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)=	#NV		
Derivative fact.=	0.05	Derivative fact.=	0.04
Results		**Results**	
Q/s (m^2/s)=	3.3E-08		
T_M (m^2/s)=	4.2E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	3.49	dt_1 (min) =	10.58
dt_2 (min) =	23.24	dt_2 (min) =	47.17
T (m^2/s) =	2.6E-08	T (m^2/s) =	3.7E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.6E-10	K_s (m/s) =	3.7E-10
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.7E-10
C_D (-) =	NA	C_D (-) =	3.0E-02
ξ (-) =	-0.7	ξ (-) =	0.6
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) =	10.58	C (m^3/Pa) =	2.7E-10
dt_2 (min) =	47.17	C_D (-) =	3.0E-02
T_T (m^2/s) =	3.7E-08	ξ (-) =	0.6
S (-) =	1.0E-06		
K_s (m/s) =	3.7E-10		
S_s (1/m) =	1.0E-08		

Comments:

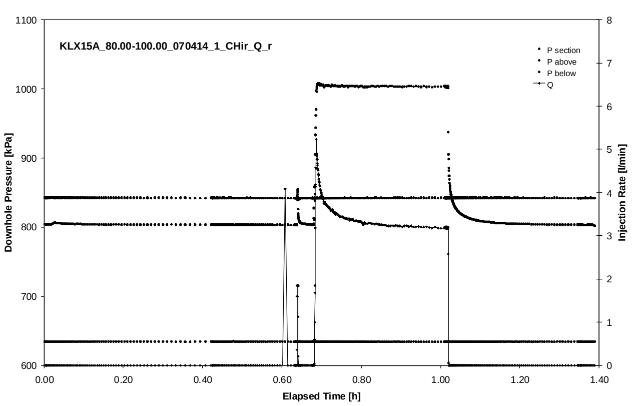
The recommended transmissivity of 3.7E-8 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-8 m2/s to 8.0E-8 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 6,601.3 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

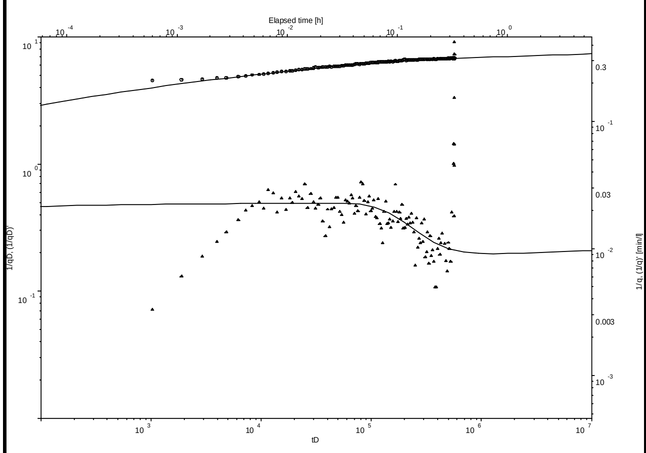
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070414 19:23
Test section from - to (m):	80.00-100.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

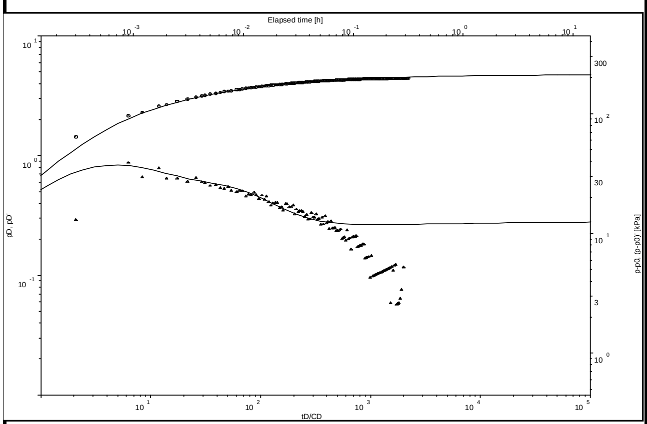


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	804		
p_i (kPa) =	805		
p_p(kPa) =	1003	p_F (kPa) =	803
Q_p (m^3/s)=	5.32E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-03	S el S^* (-)=	1.00E-03
EC_w (mS/m)=			
$Temp_w$(gr C)=	7.7		
Derivative fact.=	0.08	Derivative fact.=	0.07
Results		**Results**	
Q/s (m^2/s)=	2.6E-06		
T_M (m^2/s)=	2.8E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.33	dt_1 (min) =	0.17
dt_2 (min) =	3.44	dt_2 (min) =	0.44
T (m^2/s) =	2.9E-06	T (m^2/s) =	2.0E-06
S (-) =	1.0E-03	S (-) =	1.0E-03
K_s (m/s) =	1.5E-07	K_s (m/s) =	1.0E-07
S_s (1/m) =	5.0E-05	S_s (1/m) =	5.0E-05
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.4E-10
C_D (-) =	NA	C_D (-) =	7.1E-02
ξ (-) =	2.7	ξ (-) =	1.3
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) =	0.33	C (m^3/Pa) =	6.4E-10
dt_2 (min) =	3.44	C_D (-) =	7.1E-02
T_T (m^2/s) =	2.9E-06	ξ (-) =	2.7
S (-) =	1.0E-06		
K_s (m/s) =	1.5E-07		
S_s (1/m) =	5.0E-05		

Comments:

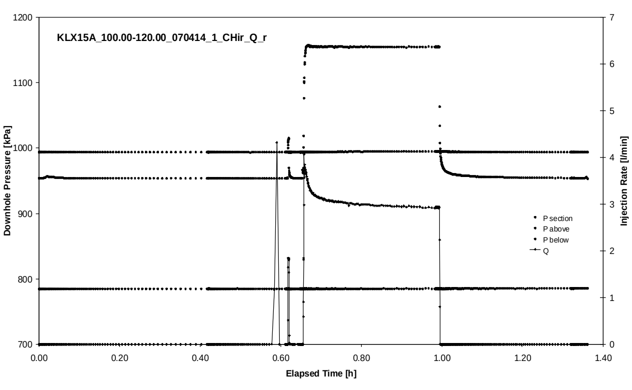
The recommended transmissivity of 2.9E-6 m2/s was derived from the analysis of the CHi phase (inner zone), which shows the best horizontal stabilisation and derivative quality. The confidence range for the interval transmissivity is estimated to be 7.0E-7 m2/s to 8.0E-6 m2/s. The flow dimension displayed during the test is 2. 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 801.0 kPa.

[1] According to SKB MD 320.004 appendix 3.

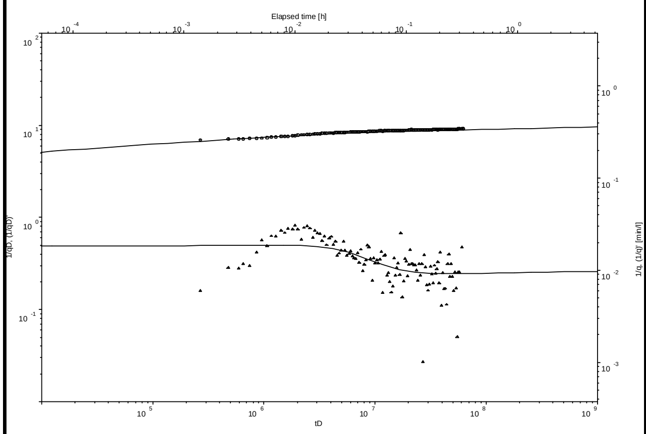
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070414 22:09
Test section from - to (m):	100.00-120.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

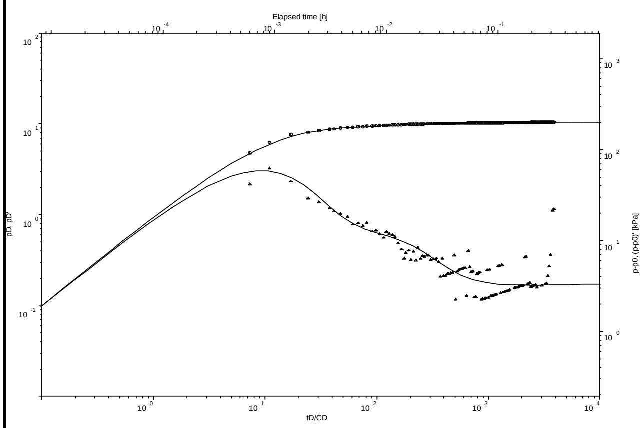
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	954		
p_i (kPa) =	954		
p_p(kPa) =	1154	p_F (kPa) =	954
Q_p (m^3/s)=	4.90E-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)=	7.9		
Derivative fact.=	0.09	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	2.4E-06		
T_M (m^2/s)=	2.5E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	0.31
dt_2 (min) =	NA	dt_2 (min) =	0.62
T (m^2/s) =	3.5E-06	T (m^2/s) =	4.1E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.8E-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) =	7.8E-10
C_D (-) =	NA	C_D (-) =	8.6E-02
ξ (-) =	1.5	ξ (-) =	3.5
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) =	0.31	C (m^3/Pa) =	7.8E-10
dt_2 (min) =	0.62	C_D (-) =	8.6E-02
T_T (m^2/s) =	4.1E-06	ξ (-) =	3.5
S (-) =	1.0E-06		
K_s (m/s) =	2.1E-07		
S_s (1/m) =	5.0E-08		

Comments:

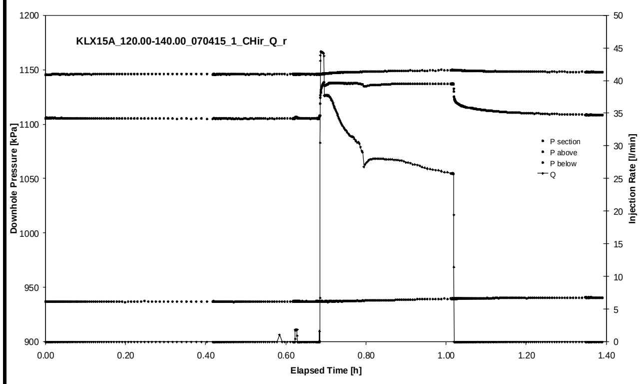
The recommended transmissivity of 4.1E-6 m2/s was derived from the analysis of the CHir phase (inner zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-6 m2/s to 2.0E-5 m2/s. The flow dimension displayed during the test is 2. 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 950.5 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

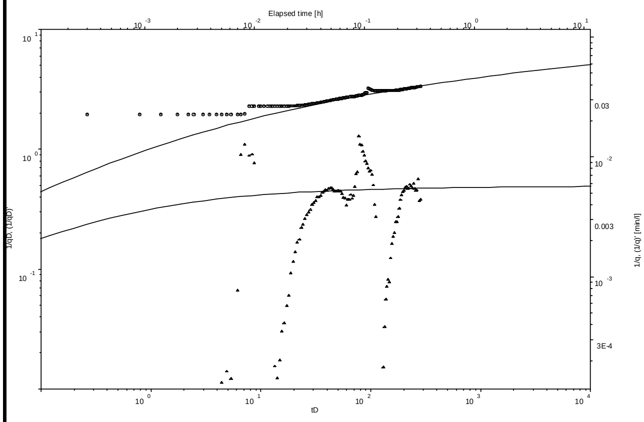
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070415 00:08
Test section from - to (m):	120.00-140.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

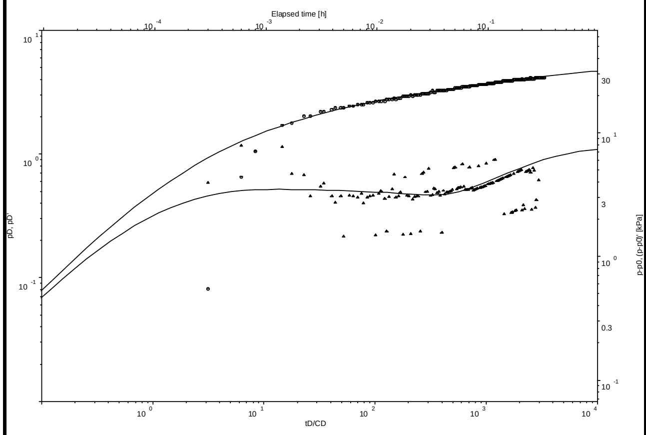


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	1105		
p_i (kPa) =	1105		
p_p(kPa) =	1137	p_F (kPa) =	1109
Q_p (m^3/s)=	4.32E-04		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	8.3		
Derivative fact.=	0.07	Derivative fact.=	0.07
Results		**Results**	
Q/s (m^2/s)=	1.3E-04		
T_M (m^2/s)=	1.4E-04		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	0.15
dt_2 (min) =	NA	dt_2 (min) =	2.58
T (m^2/s) =	7.0E-05	T (m^2/s) =	1.1E-04
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.5E-06	K_s (m/s) =	5.5E-06
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-08
C_D (-) =	NA	C_D (-) =	2.8E+00
ξ (-) =	-6.1	ξ (-) =	-5.1
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



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0.15	C (m^3/Pa) =	2.5E-08
dt_2 (min) =	2.58	C_D (-) =	2.8E+00
T_T (m^2/s) =	1.1E-04	ξ (-) =	-5.1
S (-) =	1.0E-06		
K_s (m/s) =	5.5E-06		
S_s (1/m) =	5.0E-08		

Comments:

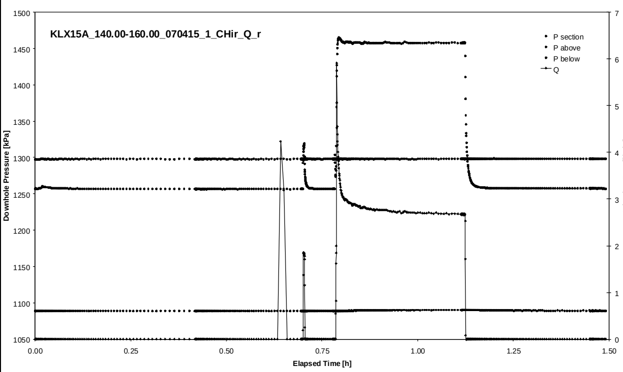
The recommended transmissivity of 1.1E-4 m2/s was derived from the analysis of the CHir phase (inner zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3.0E-5 m2/s to 3.0E-4 m2/s. The flow dimension displayed during the test is 2. 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 1,105.9 kPa.

[1] According to SKB MD 320.004 appendix 3.

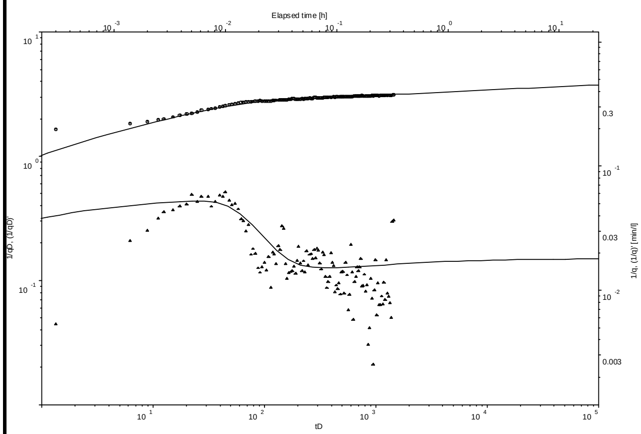
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070415 07:52
Test section from - to (m):	140.00-160.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

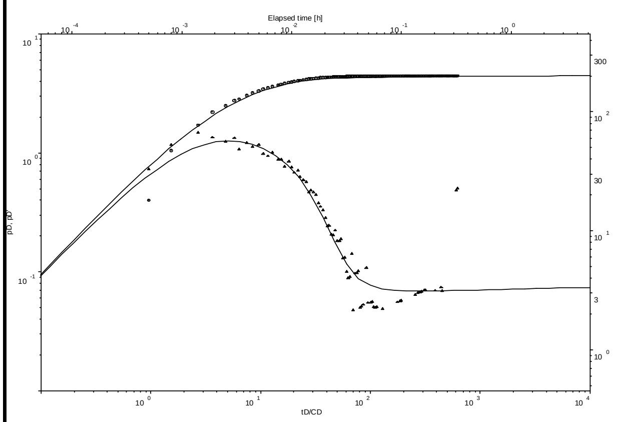
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	1257		
p_i (kPa) =	1257		
p_p(kPa) =	1457	p_F (kPa) =	1257
Q_p (m^3/s)=	4.47E-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)=	8.5		
Derivative fact.=	0.09	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	2.2E-06		
T_M (m^2/s)=	2.3E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2.49	dt_1 (min) =	NA
dt_2 (min) =	9.29	dt_2 (min) =	NA
T (m^2/s) =	3.6E-06	T (m^2/s) =	1.6E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.8E-07	K_s (m/s) =	8.0E-08
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.9E-09
C_D (-) =	NA	C_D (-) =	2.1E-01
ξ (-) =	-3.2	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} (-) =	

Selected representative parameters.			
dt_1 (min) =	2.49	C (m^3/Pa) =	1.9E-09
dt_2 (min) =	9.29	C_D (-) =	2.1E-01
T_T (m^2/s) =	3.6E-06	ξ (-) =	-3.2
S (-) =	1.0E-06		
K_s (m/s) =	1.8E-07		
S_s (1/m) =	5.0E-08		

Comments:

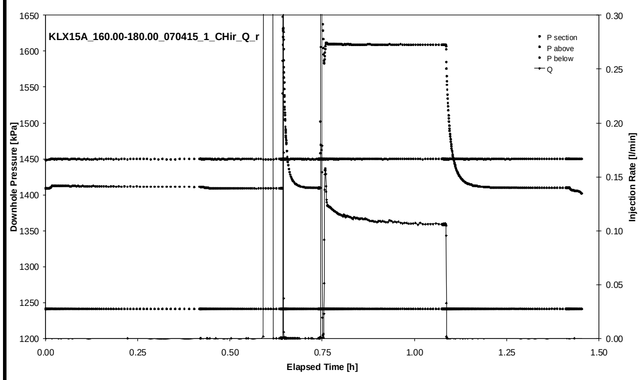
The recommended transmissivity of 3.6E-6 m2/s was derived from the analysis of the CHi phase (outer zone), which shows a clear horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be 8.0E-7 m2/s to 3.0E-5 m2/s. The flow dimension displayed during the test is 2. 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 1,256.9 kPa.

[1] According to SKB MD 320.004 appendix 3.

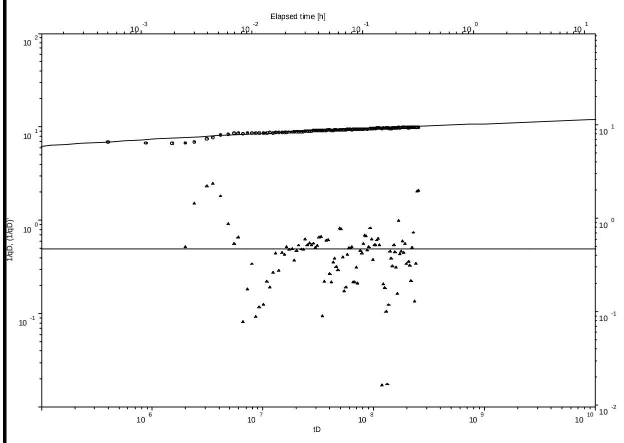
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070415 10:15
Test section from - to (m):	160.00-180.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2\cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

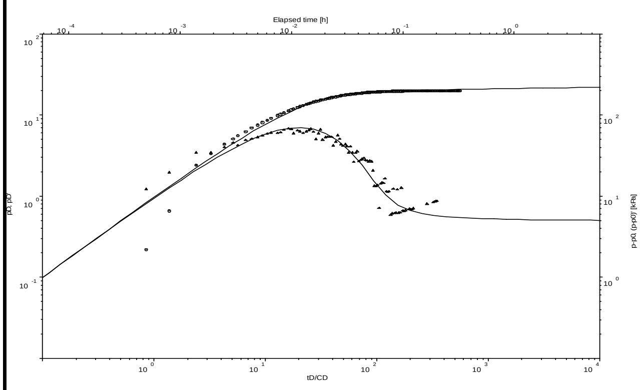
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	1409		
p_i (kPa) =	1409		
p_p(kPa) =	1609	p_F (kPa) =	1410
Q_p (m^3/s)=	1.77E-06		
tp (s) =	1177	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	8.8		
Derivative fact.=	0.07	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	8.7E-08		
T_M (m^2/s)=	9.1E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.00	dt_1 (min) =	NA
dt_2 (min) =	16.97	dt_2 (min) =	NA
T (m^2/s) =	1.4E-07	T (m^2/s) =	2.9E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	7.0E-09	K_s (m/s) =	1.4E-08
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.9E-10
C_D (-) =	NA	C_D (-) =	4.3E-02
ξ (-) =	3.9	ξ (-) =	14.3
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) =	1.00	C (m^3/Pa) =	3.9E-10
dt_2 (min) =	16.97	C_D (-) =	4.3E-02
T_T (m^2/s) =	1.4E-07	ξ (-) =	3.9
S (-) =	1.0E-06		
K_s (m/s) =	7.0E-09		
S_s (1/m) =	5.0E-08		

Comments:

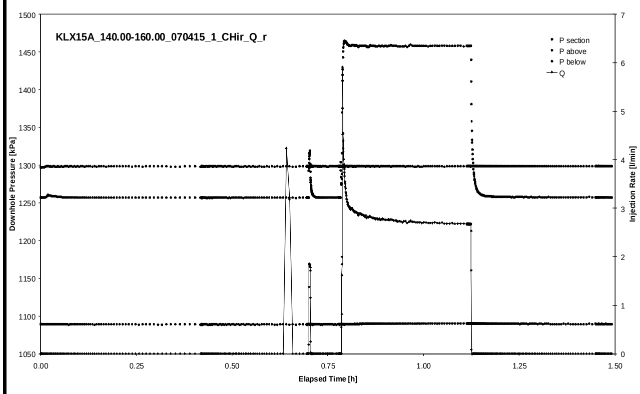
The recommended transmissivity of 1.4E-7 m2/s was derived from the analysis of the CHi phase, which shows the best horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be 7.0E-8 m2/s to 6.0E-7 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,408.5 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

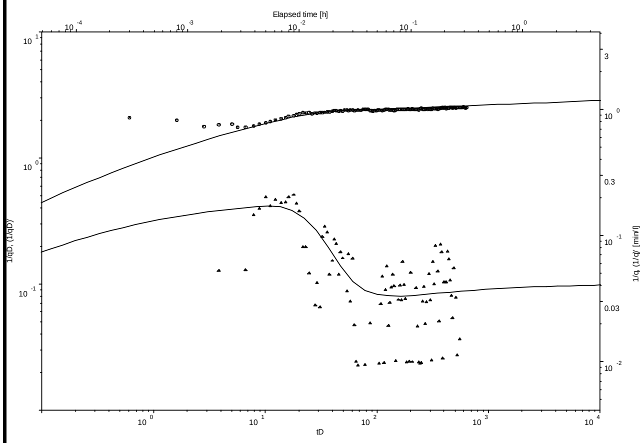
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070415 12:35
Test section from - to (m):	180.00-200.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

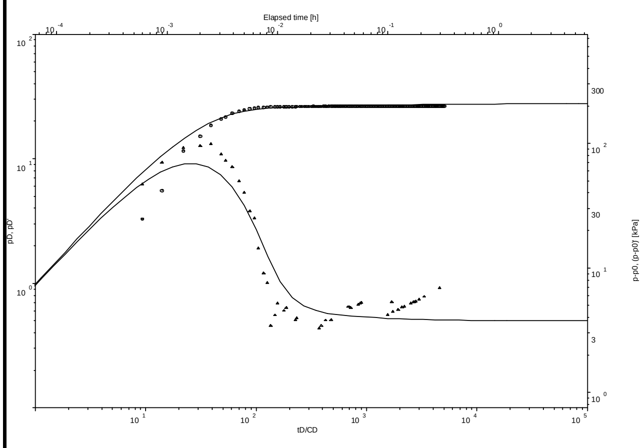


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	1561		
p_i (kPa) =	1562		
p_p(kPa) =	1762	p_F (kPa) =	1562
Q_p (m^3/s)=	1.62E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	9.1		
Derivative fact.=	0.08	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	7.9E-07		
T_M (m^2/s)=	8.3E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2.92	dt_1 (min) =	0.93
dt_2 (min) =	14.23	dt_2 (min) =	6.49
T (m^2/s) =	1.6E-06	T (m^2/s) =	3.5E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	8.0E-08	K_s (m/s) =	1.8E-07
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.1E-10
C_D (-) =	NA	C_D (-) =	5.6E-02
ξ (-) =	-3.0	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) =	2.92	C (m^3/Pa) =	5.1E-10
dt_2 (min) =	14.23	C_D (-) =	5.6E-02
T_T (m^2/s) =	1.6E-06	ξ (-) =	-3.0
S (-) =	1.0E-06		
K_s (m/s) =	8.0E-08		
S_s (1/m) =	5.0E-08		

Comments:

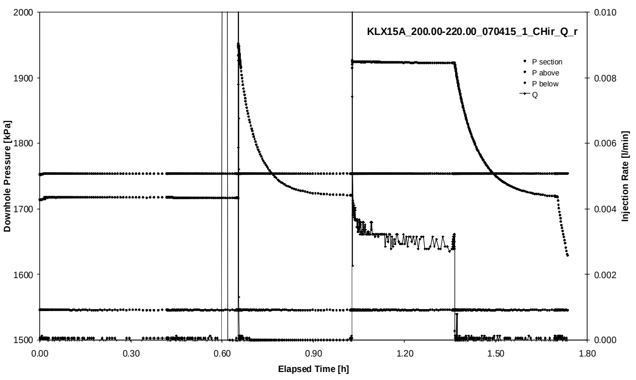
The recommended transmissivity of 1.6E-6 m2/s was derived from the analysis of the CHi phase (outer zone), which shows a better horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be 2.0E-7 m2/s to 5.0E-6 m2/s. The flow dimension displayed during the test is 2. 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 1,561.9 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

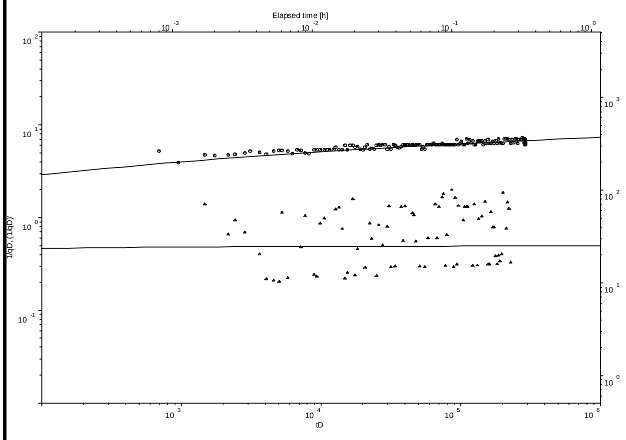
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070415 14:59
Test section from - to (m):	200.00-220.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

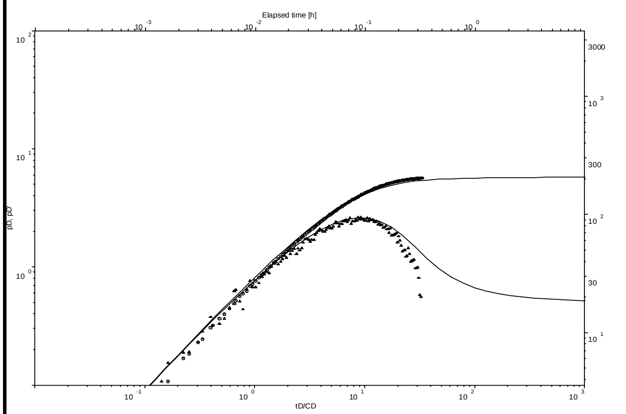


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	1714		
p_i (kPa) =	1721		
p_p(kPa) =	1921	p_F (kPa) =	1719
Q_p (m^3/s)=	5.00E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	9.3		
Derivative fact.=	0.09	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.5E-09		
T_M (m^2/s)=	2.6E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.49	dt_1 (min) =	NA
dt_2 (min) =	13.40	dt_2 (min) =	NA
T (m^2/s) =	2.6E-09	T (m^2/s) =	2.3E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.3E-10	K_s (m/s) =	1.2E-10
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.1E-11
C_D (-) =	NA	C_D (-) =	5.6E-03
ξ (-) =	2.5	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) =	0.49	C (m^3/Pa) =	5.1E-11
dt_2 (min) =	13.40	C_D (-) =	5.6E-03
T_T (m^2/s) =	2.6E-09	ξ (-) =	2.5
S (-) =	1.0E-06		
K_s (m/s) =	1.3E-10		
S_s (1/m) =	5.0E-08		

Comments:

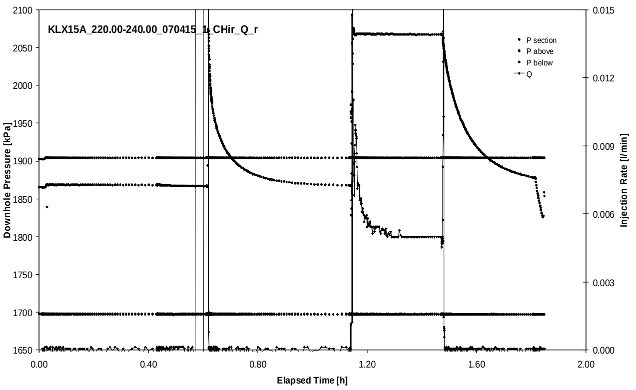
The recommended transmissivity of 2.6E-9 m2/s was derived from the analysis of the CHi phase, which shows a horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be 8.0E-10 m2/s to 5.0E-9 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 1,700.2 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

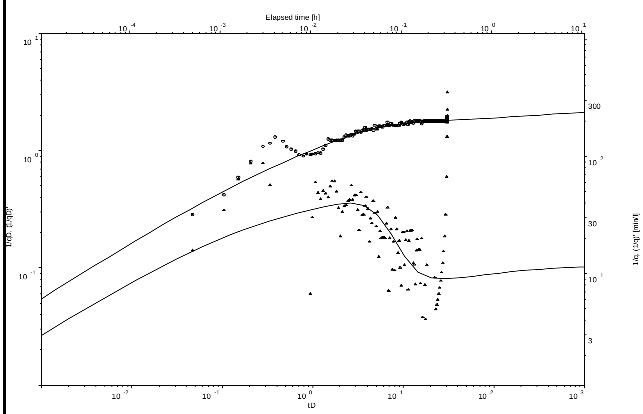
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070415 17:19
Test section from - to (m):	220.00-240.00	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

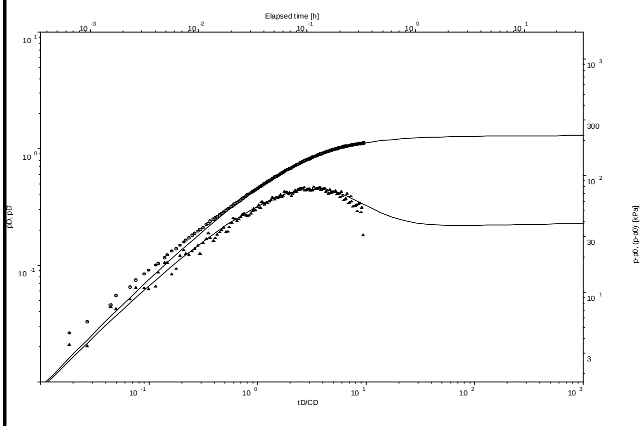


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	1865		
p_i (kPa) =	1867		
p_p(kPa) =	2067	p_F (kPa) =	1876
Q_p (m^3/s)=	8.33E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	9.5		
Derivative fact.=	0.14	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	4.1E-09		
T_M (m^2/s)=	4.3E-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) =	5.5E-09	T (m^2/s) =	1.8E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.8E-10	K_s (m/s) =	9.0E-11
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.9E-11
C_D (-) =	NA	C_D (-) =	7.6E-03
ξ (-) =	-1.7	ξ (-) =	-2.2
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

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) =	6.9E-11
dt_2 (min) =	NA	C_D (-) =	7.6E-03
T_T (m^2/s) =	5.5E-09	ξ (-) =	-1.7
S (-) =	1.0E-06		
K_s (m/s) =	2.8E-10		
S_s (1/m) =	5.0E-08		

Comments:

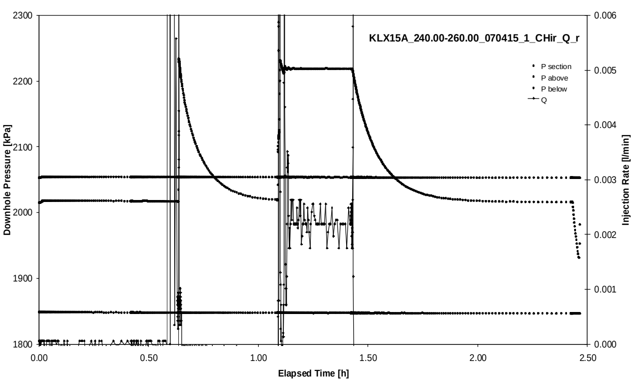
The recommended transmissivity of 5.5E-9 m2/s was derived from the analysis of the CHi phase (outer zone), which shows a slight horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be 7.0E-10 m2/s to 7.0E-9 m2/s. The flow dimension displayed during the test is 2. 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 1,847.1 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

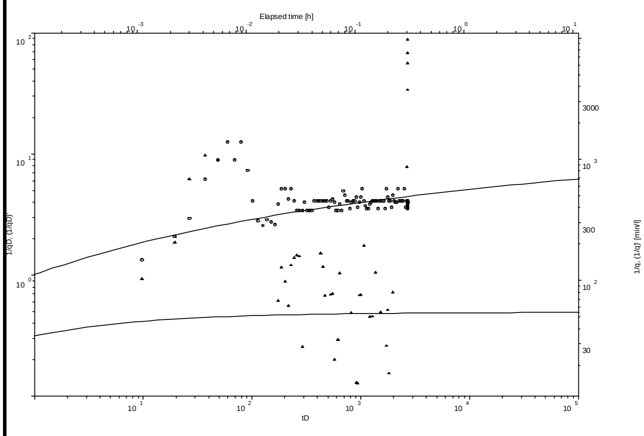
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070415 19:47
Test section from - to (m):	240.00-260.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

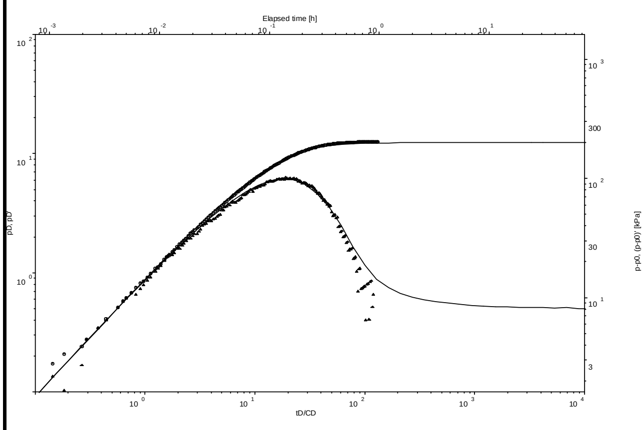


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2016		
p_i (kPa) =	2019		
p_p(kPa) =	2215	p_F (kPa) =	2015
Q_p (m^3/s)=	3.33E-08		
tp (s) =	1200	t_F (s) =	3600
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	9.8		
Derivative fact.=	0.21	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	1.7E-09		
T_M (m^2/s)=	1.7E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.19	dt_1 (min) =	NA
dt_2 (min) =	12.49	dt_2 (min) =	NA
T (m^2/s) =	1.2E-09	T (m^2/s) =	3.6E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	6.0E-11	K_s (m/s) =	1.8E-10
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.2E-11
C_D (-) =	NA	C_D (-) =	6.8E-03
ξ (-) =	0.5	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) =	6.2E-11
dt_2 (min) =	NA	C_D (-) =	6.8E-03
T_T (m^2/s) =	3.6E-09	ξ (-) =	2.5
S (-) =	1.0E-06		
K_s (m/s) =	1.8E-10		
S_s (1/m) =	5.0E-08		

Comments:

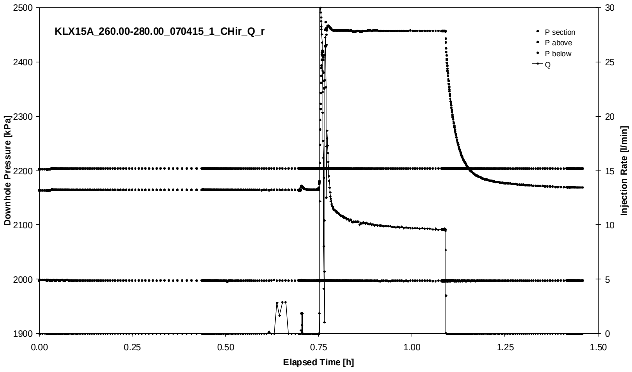
The recommended transmissivity of 3.6E-9 m2/s was derived from the analysis of the CHir phase, which shows a better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-10 m2/s to 5.0E-9 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,006.1 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

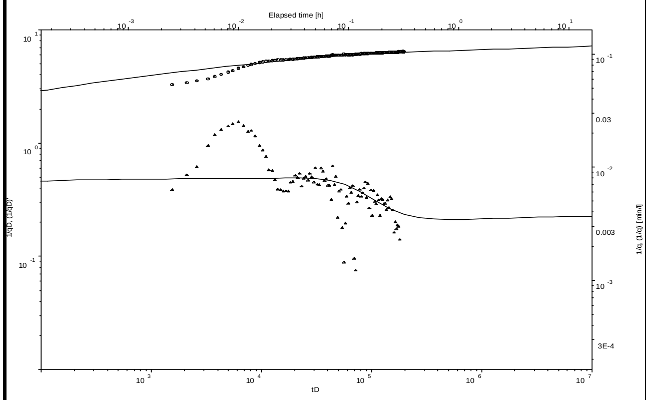
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070415 22:53
Test section from - to (m):	260.00-280.00	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

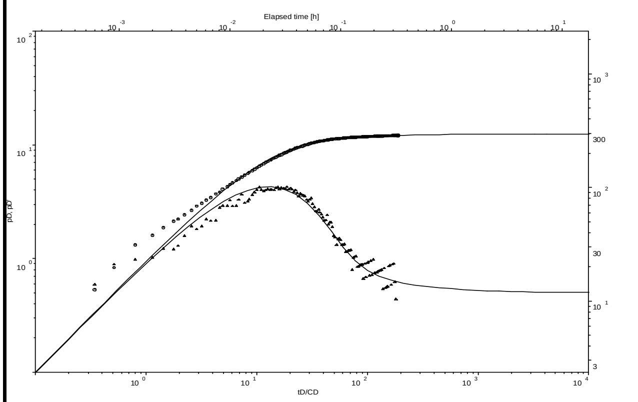


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2163		
p_i (kPa) =	2164		
p_p(kPa) =	2456	p_F (kPa) =	2170
Q_p (m^3/s)=	1.60E-04		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	10.0		
Derivative fact.=	0.09	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	5.4E-06		
T_M (m^2/s)=	5.6E-06		
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) =	1.2E-05	T (m^2/s) =	1.1E-05
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	6.0E-07	K_s (m/s) =	5.5E-07
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	4.6E-08
C_D (-) =	NA	C_D (-) =	5.1E+00
ξ (-) =	-1.6	ξ (-) =	4.2
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	#NV	C (m^3/Pa) =	4.6E-08
dt_2 (min) =	#NV	C_D (-) =	5.1E+00
T_T (m^2/s) =	1.1E-05	ξ (-) =	4.2
S (-) =	1.0E-06		
K_s (m/s) =	5.5E-07		
S_s (1/m) =	5.0E-08		

Comments:

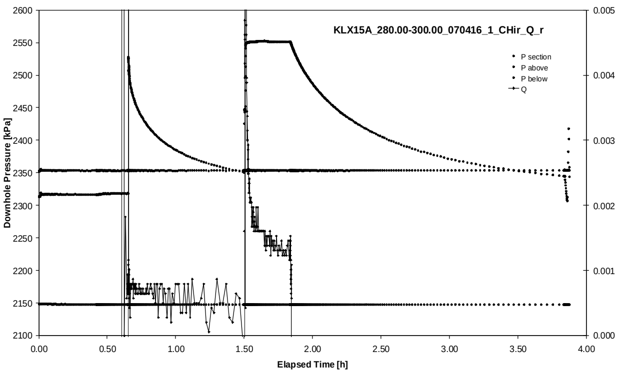
The recommended transmissivity of 1.1E-5 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-06 m2/s to 3.0E-05 m2/s. A flow dimension of 2 was assumed for the test. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,159.2 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

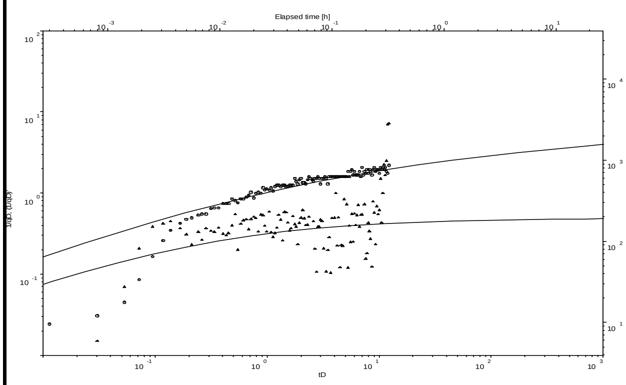
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070416 00:56
Test section from - to (m):	280.00-300.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

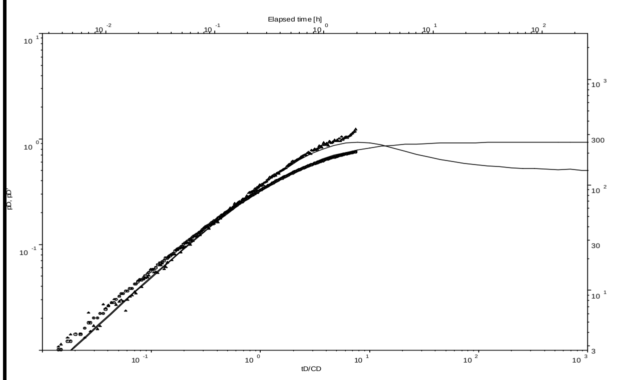


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2314		
p_i (kPa) =	2351		
p_p(kPa) =	2549	p_F (kPa) =	2346
Q_p (m^3/s)=	2.05E-08		
tp (s) =	1200	t_F (s) =	7200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	10.2		
Derivative fact.=	0.13	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	1.0E-09		
T_M (m^2/s)=	1.1E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2.29	dt_1 (min) =	NA
dt_2 (min) =	13.95	dt_2 (min) =	NA
T (m^2/s) =	3.4E-10	T (m^2/s) =	2.1E-10
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.7E-11	K_s (m/s) =	1.0E-11
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.3E-10
C_D (-) =	NA	C_D (-) =	1.4E-02
ξ (-) =	-1.5	ξ (-) =	-1.3
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) =	2.29	C (m^3/Pa) =	1.3E-10
dt_2 (min) =	13.95	C_D (-) =	1.4E-02
T_T (m^2/s) =	3.4E-10	ξ (-) =	-1.5
S (-) =	1.0E-06		
K_s (m/s) =	1.7E-11		
S_s (1/m) =	5.0E-08		

Comments:

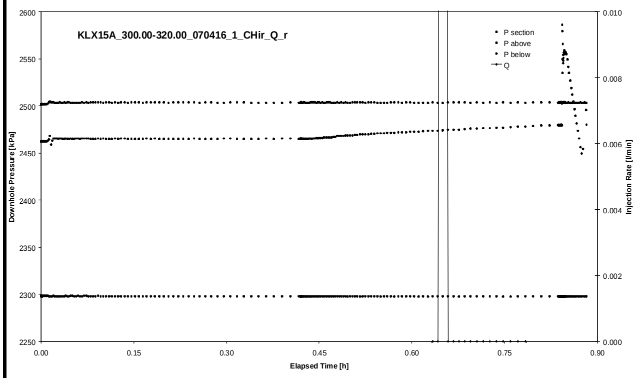
The recommended transmissivity of 3.4E-10 m2/s was derived from the analysis of the CHi phase, which shows the best horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be 1.0E-10 m2/s to 3.0E-09 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,301.1 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070416 06:46
Test section from - to (m):	300.00-320.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	2462		
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)=	10.4		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

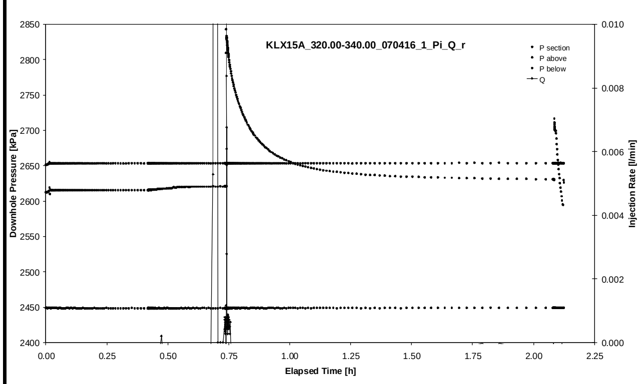
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070416 08:19
Test section from - to (m):	320.00-340.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

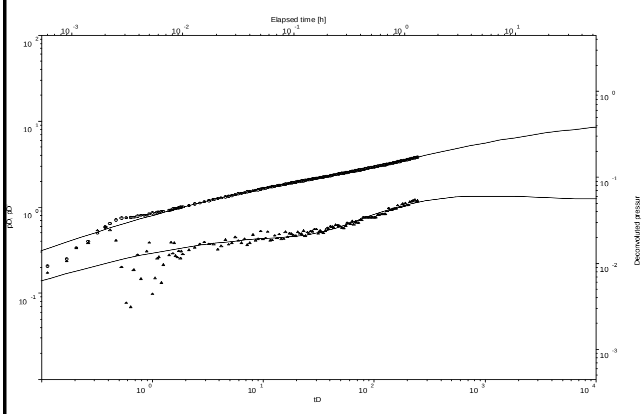


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2612		
p_i (kPa) =	2620		
p_p(kPa) =	2831	p_F (kPa) =	2631
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	4860
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	10.7		
Derivative fact.=	NA	Derivative fact.=	0.02
Results		**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) =	1.48
dt_2 (min) =	NA	dt_2 (min) =	8.63
T (m^2/s) =	NA	T (m^2/s) =	4.4E-10
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	2.2E-11
S_s (1/m) =	NA	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	4.5E-11
C_D (-) =	NA	C_D (-) =	5.0E-03
ξ (-) =	NA	ξ (-) =	-0.6
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

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	1.48	C (m^3/Pa) =	4.5E-11
dt_2 (min) =	8.63	C_D (-) =	5.0E-03
T_T (m^2/s) =	4.4E-10	ξ (-) =	-0.6
S (-) =	1.0E-06		
K_s (m/s) =	2.2E-11		
S_s (1/m) =	5.0E-08		

Comments:

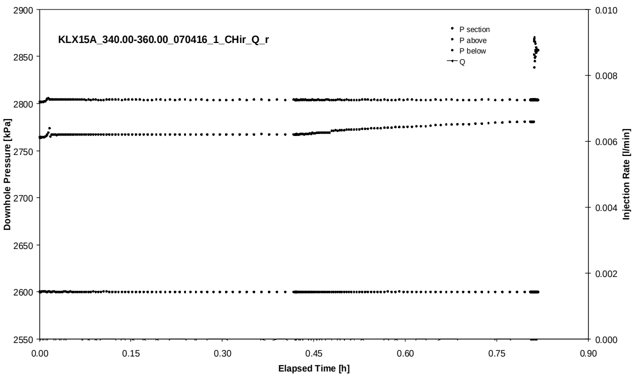
The recommended transmissivity of 4.4E-10 m2/s was derived from the analysis of the Pi phase (inner zone). The confidence range for the interval transmissivity is estimated to be 1.0E-10 to 8.0E-10 m2/s. The analysis was conducted using a flow dimension of 2.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070416 11:08
Test section from - to (m):	340.00-360.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	2764		
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)=	10.9		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

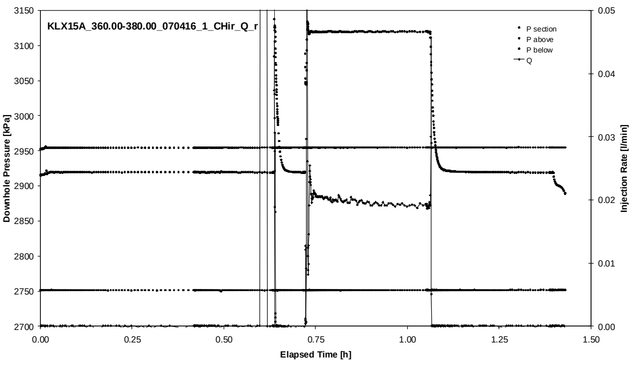
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

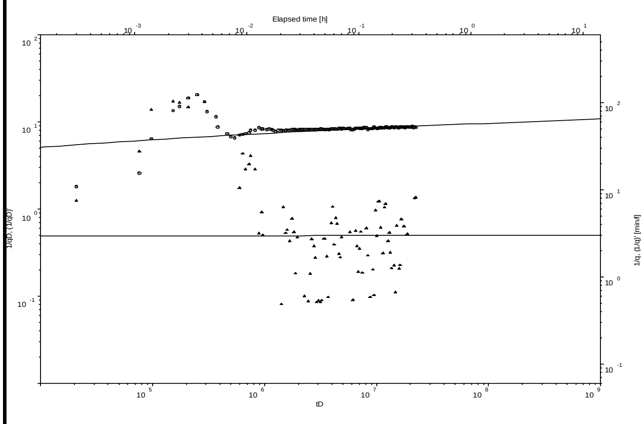
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070416 13:33
Test section from - to (m):	360.00-380.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

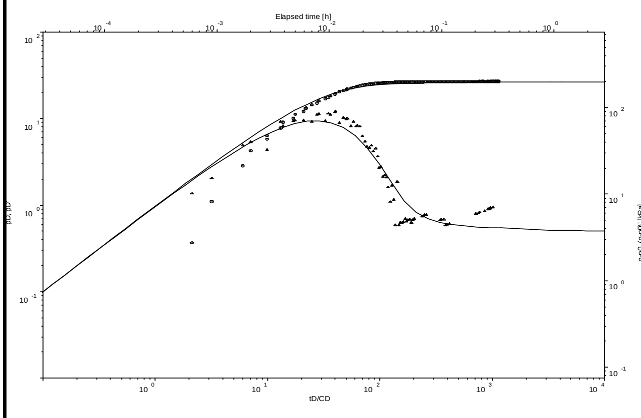


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2916		
p_i (kPa) =	2920		
p_p(kPa) =	3119	p_F (kPa) =	2919
Q_p (m^3/s)=	3.17E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.1		
Derivative fact.=	0.06	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.6E-08		
T_M (m^2/s)=	1.6E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.17	dt_1 (min) =	NA
dt_2 (min) =	15.26	dt_2 (min) =	NA
T (m^2/s) =	2.2E-08	T (m^2/s) =	6.9E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.1E-09	K_s (m/s) =	3.5E-09
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	4.5E-11
C_D (-) =	NA	C_D (-) =	5.0E-03
ξ (-) =	3.6	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

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	1.17	C (m^3/Pa) =	4.5E-11
dt_2 (min) =	15.26	C_D (-) =	5.0E-03
T_T (m^2/s) =	2.2E-08	ξ (-) =	3.6
S (-) =	1.0E-06		
K_s (m/s) =	1.1E-09		
S_s (1/m) =	5.0E-08		

Comments:

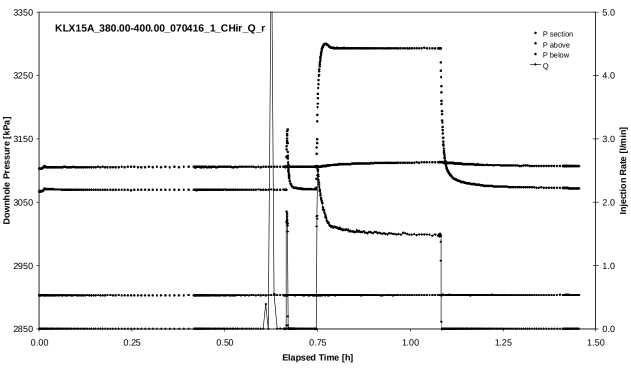
The recommended transmissivity of 2.2E-08 m2/s was derived from the analysis of the CHi phase, which shows a slight horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be 7.0E-09 m2/s to 8.0E-08 m2/s. A flow dimension of 2 was assumed for the test. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 2,918.2 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

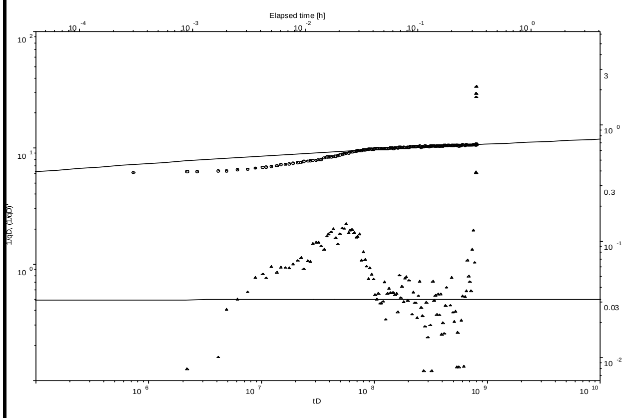
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070416 15:49
Test section from - to (m):	380.00-400.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

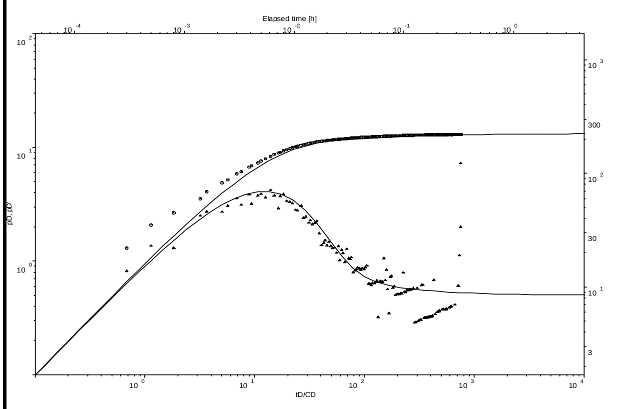


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3067		
p_i (kPa) =	3070		
p_p(kPa) =	3292	p_F (kPa) =	3072
Q_p (m^3/s)=	2.47E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.4		
Derivative fact.=	0.09	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.1E-06		
T_M (m^2/s)=	1.1E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2.66	dt_1 (min) =	3.79
dt_2 (min) =	14.83	dt_2 (min) =	16.15
T (m^2/s) =	1.9E-06	T (m^2/s) =	2.4E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	9.3E-08	K_s (m/s) =	1.2E-07
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.4E-09
C_D (-) =	NA	C_D (-) =	2.7E-01
ξ (-) =	3.1	ξ (-) =	5.6
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) =	3.79	C (m^3/Pa) =	2.4E-09
dt_2 (min) =	16.15	C_D (-) =	2.7E-01
T_T (m^2/s) =	2.4E-06	ξ (-) =	5.6
S (-) =	1.0E-06		
K_s (m/s) =	1.2E-07		
S_s (1/m) =	5.0E-08		

Comments:

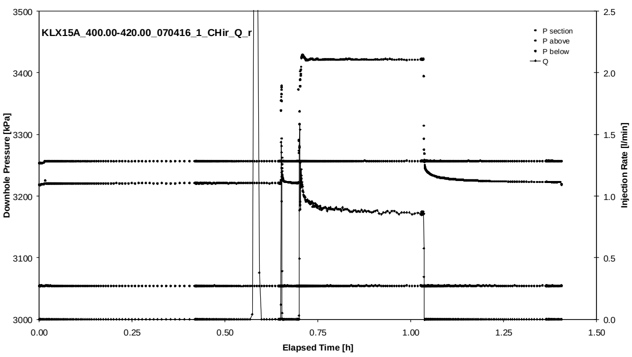
The recommended transmissivity of 2.4E-06 m2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-07 m2/s to 5.0E-06 m2/s. The flow dimension displayed during the test is 2. 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 3,067.2 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

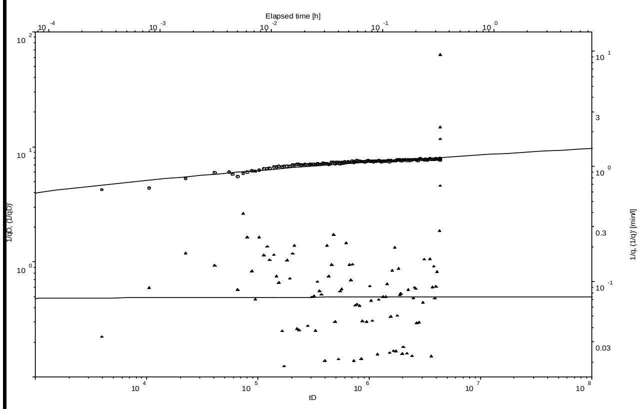
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070416 00:00
Test section from - to (m):	400.00-420.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

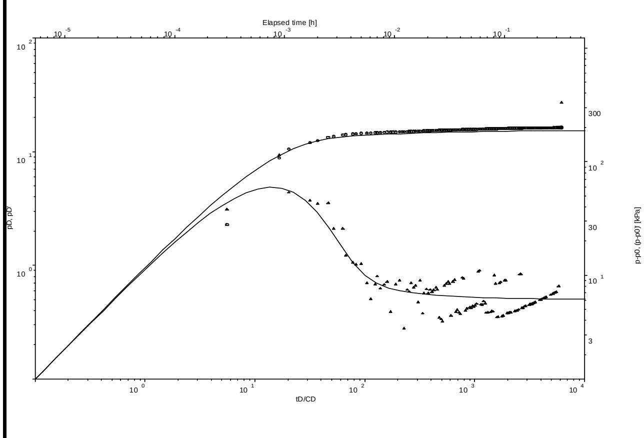


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3219		
p_i (kPa) =	3222		
p_p(kPa) =	3422	p_F (kPa) =	3223
Q_p (m^3/s)=	1.43E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.6		
Derivative fact.=	0.04	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	7.0E-07		
T_M (m^2/s)=	7.3E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.38	dt_1 (min) =	0.46
dt_2 (min) =	15.73	dt_2 (min) =	10.58
T (m^2/s) =	8.8E-07	T (m^2/s) =	1.9E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	4.4E-08	K_s (m/s) =	9.5E-08
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.4E-10
C_D (-) =	NA	C_D (-) =	2.6E-02
ξ (-) =	0.9	ξ (-) =	8.7
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0.46	C (m^3/Pa) =	2.4E-10
dt_2 (min) =	10.58	C_D (-) =	2.6E-02
T_T (m^2/s) =	1.9E-06	ξ (-) =	8.7
S (-) =	1.0E-06		
K_s (m/s) =	9.5E-08		
S_s (1/m) =	5.0E-08		

Comments:

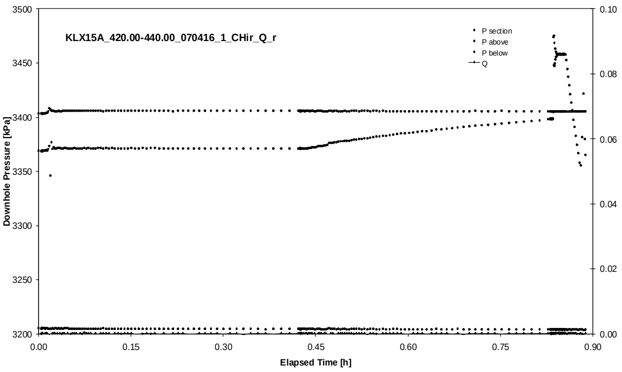
The recommended transmissivity of 1.9E-06 m2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5.0E-07 m2/s to 4.0E-06 m2/s. The flow dimension displayed during the test is 2. 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 3,220.8 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070416 19:54
Test section from - to (m):	420.00-440.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	3369		
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)=	11.8		
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) =	1.00E-11	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) =	1.00E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

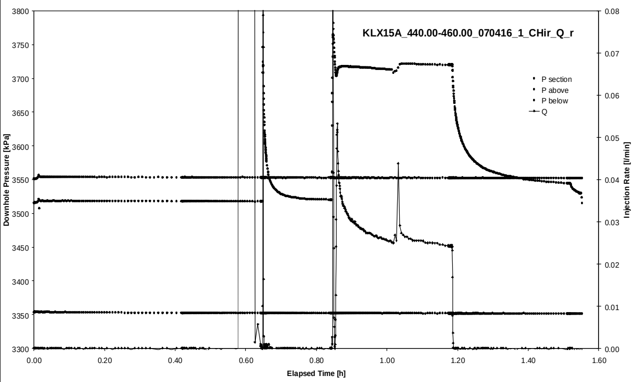
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

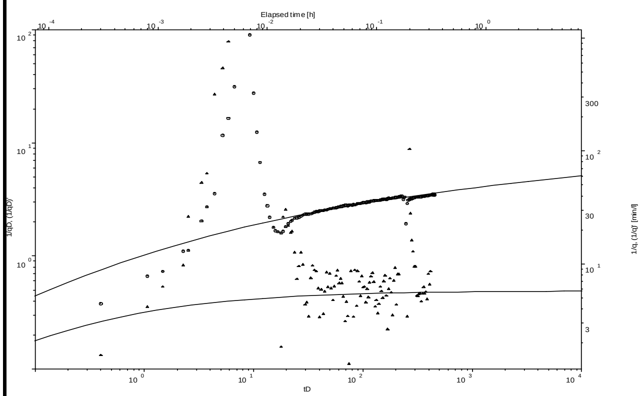
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070416 22:04
Test section from - to (m):	440.00-460.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

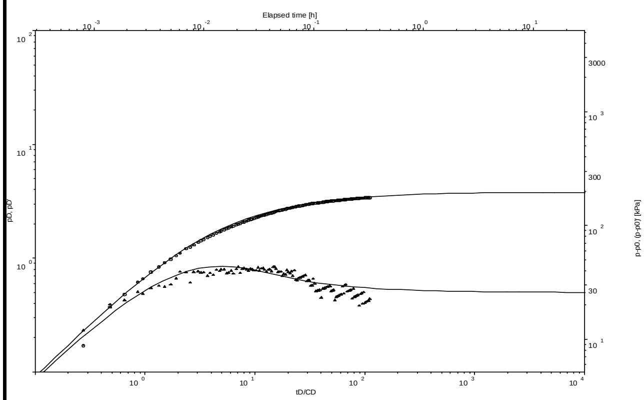


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3517		
p_i (kPa) =	3520		
p_p(kPa) =	3720	p_F (kPa) =	3543
Q_p (m^3/s)=	4.00E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.1		
Derivative fact.=	0.02	Derivative fact.=	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) =	1.52	dt_1 (min) =	3.96
dt_2 (min) =	16.54	dt_2 (min) =	14.14
T (m^2/s) =	1.1E-08	T (m^2/s) =	1.4E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.5E-10	K_s (m/s) =	7.1E-10
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	9.5E-11
C_D (-) =	NA	C_D (-) =	1.0E-02
ξ (-) =	-1.5	ξ (-) =	-1.2
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	3.96	C (m^3/Pa) =	9.5E-11
dt_2 (min) =	14.14	C_D (-) =	1.0E-02
T_T (m^2/s) =	1.4E-08	ξ (-) =	-1.2
S (-) =	1.0E-06		
K_s (m/s) =	7.0E-10		
S_s (1/m) =	5.0E-08		

Comments:

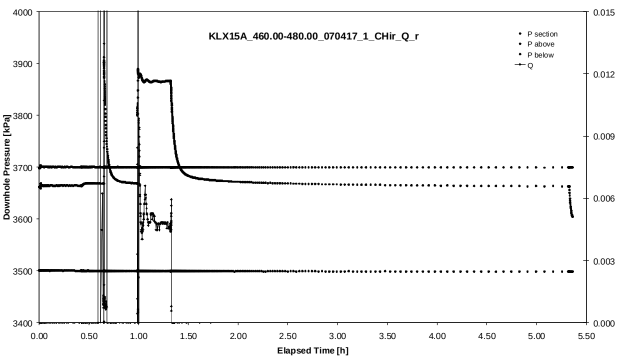
The recommended transmissivity of 1.4E-08 m2/s was derived from the analysis of the CHir phase, which shows a better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-09 m2/s to 3.0E-08 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,526.8 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

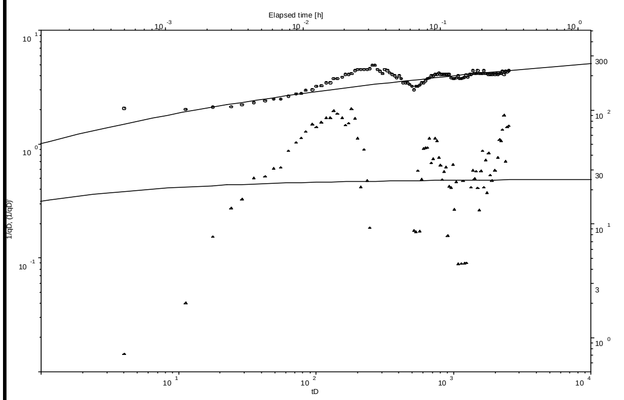
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070417 00:11
Test section from - to (m):	460.00-480.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

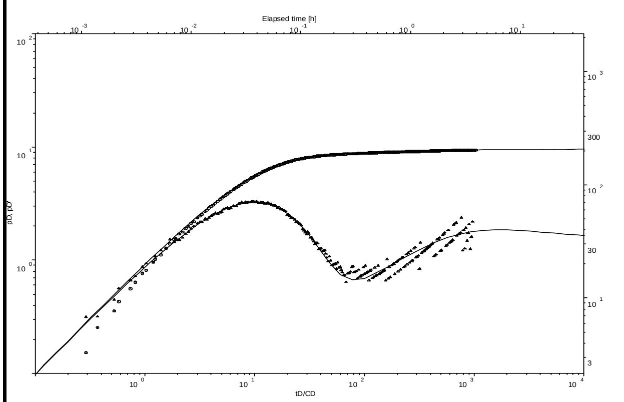


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3662		
p_i (kPa) =	3669		
p_p(kPa) =	3865	p_F (kPa) =	3663
Q_p (m^3/s)=	8.00E-08		
tp (s) =	1200	t_F (s) =	14400
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.3		
Derivative fact.=	0.14	Derivative fact.=	0.08
Results		**Results**	
Q/s (m^2/s)=	4.0E-09		
T_M (m^2/s)=	4.2E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	12.85
dt_2 (min) =	NA	dt_2 (min) =	29.99
T (m^2/s) =	2.6E-09	T (m^2/s) =	6.1E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.3E-10	K_s (m/s) =	3.1E-10
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.3E-11
C_D (-) =	NA	C_D (-) =	5.8E-03
ξ (-) =	0.0	ξ (-) =	4.9
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) =	12.85	C (m^3/Pa) =	5.3E-11
dt_2 (min) =	29.99	C_D (-) =	5.8E-03
T_T (m^2/s) =	6.1E-09	ξ (-) =	4.9
S (-) =	1.0E-06		
K_s (m/s) =	3.1E-10		
S_s (1/m) =	5.0E-08		

Comments:

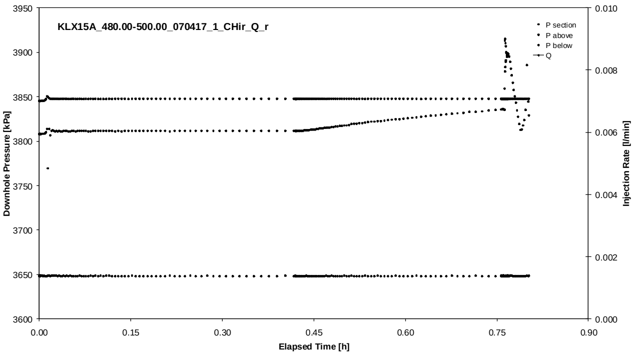
The recommended transmissivity of 6.1E-09 m2/s was derived from the analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-09 m2/s to 1.0E-08 m2/s. The flow dimension displayed during the test is 2. 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 3,661.1 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070417 06:50
Test section from - to (m):	480.00-500.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	3808		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

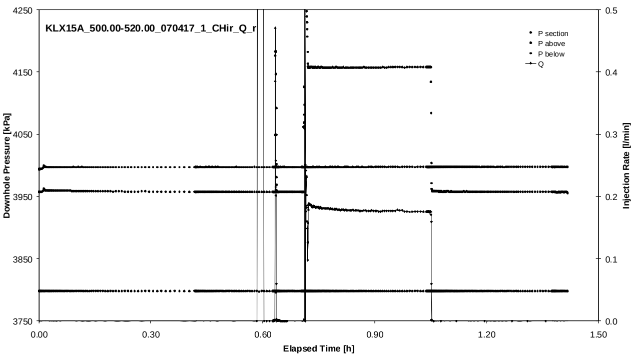
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

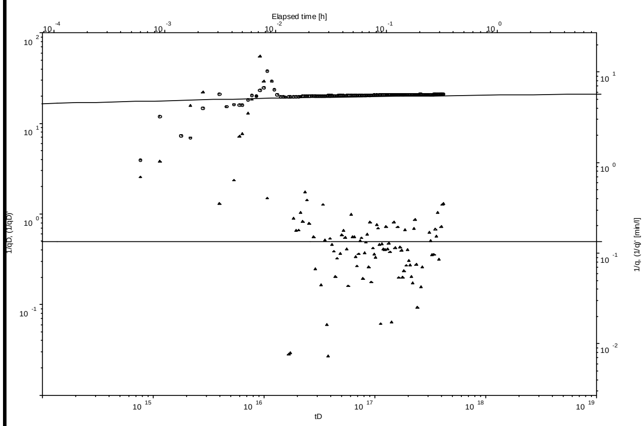
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070417 08:22
Test section from - to (m):	500.00-520.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

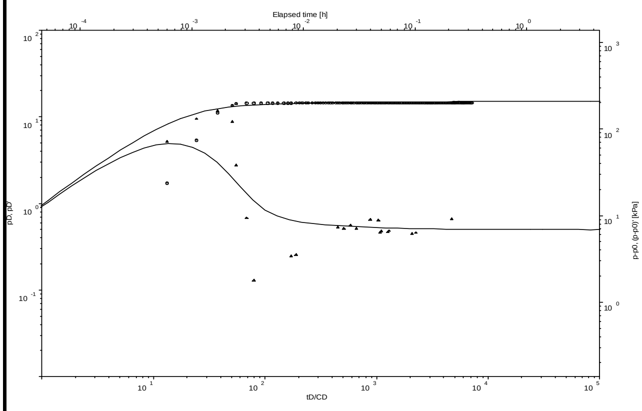
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3957		
p_i (kPa) =	3957		
p_p(kPa) =	4157	p_F (kPa) =	3958
Q_p (m^3/s)=	2.92E-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)=	12.7		
Derivative fact.=	0.05	Derivative fact.=	0.01
Results		**Results**	
Q/s (m^2/s)=	1.4E-07		
T_M (m^2/s)=	1.5E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.52	dt_1 (min) =	NA
dt_2 (min) =	15.14	dt_2 (min) =	NA
T (m^2/s) =	4.8E-07	T (m^2/s) =	3.4E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.4E-08	K_s (m/s) =	1.7E-08
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.6E-11
C_D (-) =	NA	C_D (-) =	3.9E-03
ξ (-) =	13.9	ξ (-) =	9.7
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) =	1.52	C (m^3/Pa) =	3.6E-11
dt_2 (min) =	15.14	C_D (-) =	3.9E-03
T_T (m^2/s) =	4.8E-07	ξ (-) =	13.9
S (-) =	1.0E-06		
K_s (m/s) =	2.4E-08		
S_s (1/m) =	5.0E-08		

Comments:

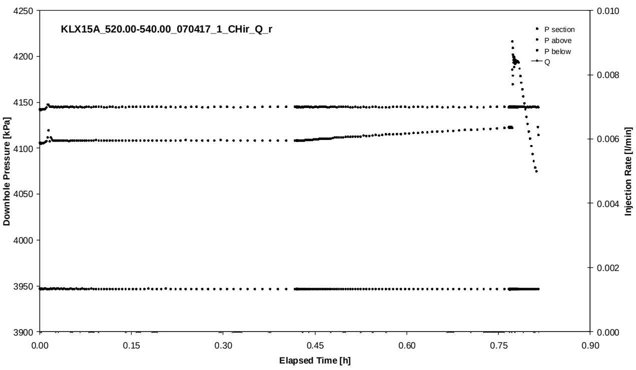
The recommended transmissivity of 4.8E-07 m2/s was derived from the analysis of the CHi phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-07 m2/s to 8.0E-07 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,957.5 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070417 10:40
Test section from - to (m):	520.00-540.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	4106		
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) =	1.0E-11	T (m^2/s) =	NA
S (-) =	1.0E-06	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

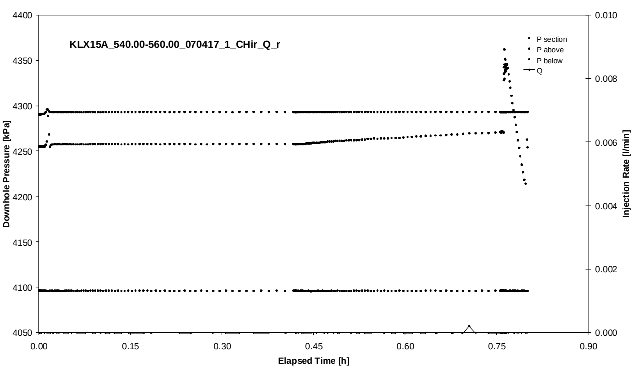
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070417 13:13
Test section from - to (m):	540.00-560.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	4255		
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)=	13.2		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

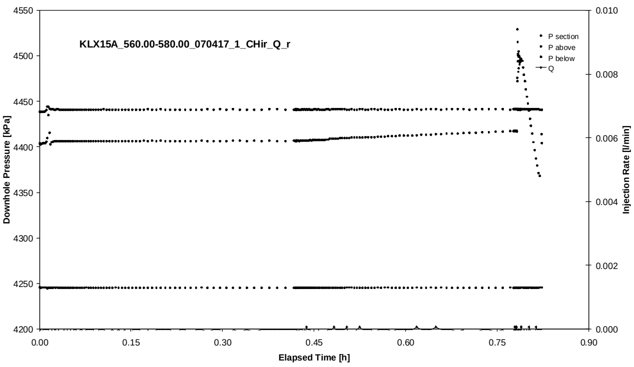
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070417 14:39
Test section from - to (m):	560.00-580.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	4404		
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)=	13.4		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

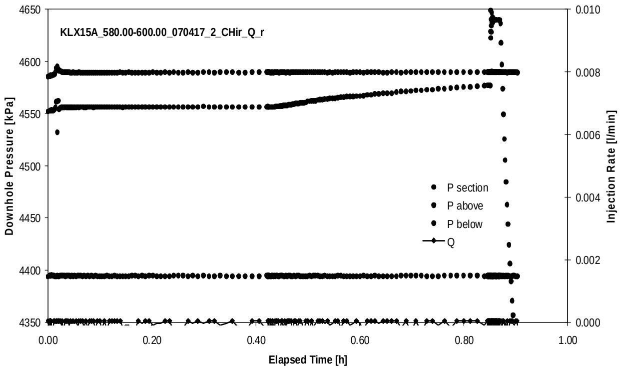
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	2
Borehole ID:	KLX15A	Test start:	070417 17:01
Test section from - to (m):	580.00-600.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	4553		
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)=	13.7		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

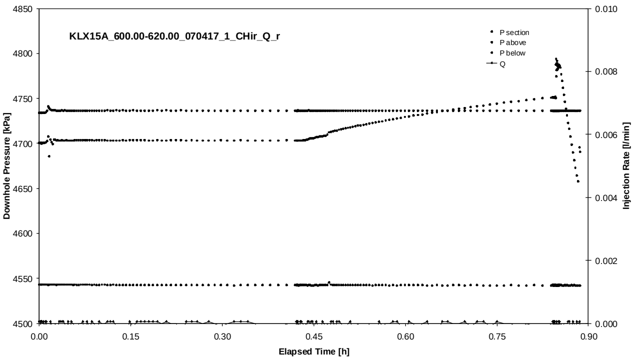
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070417 18:29
Test section from - to (m):	600.00-620.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

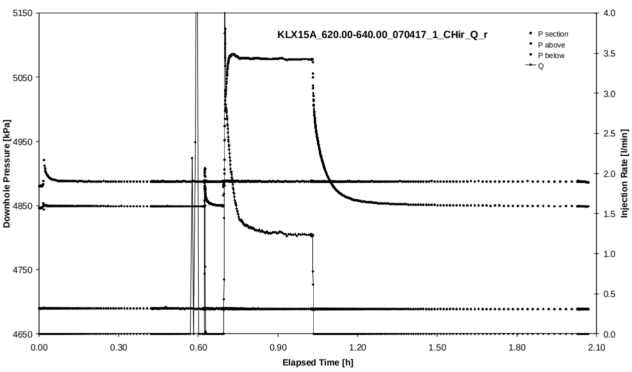
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

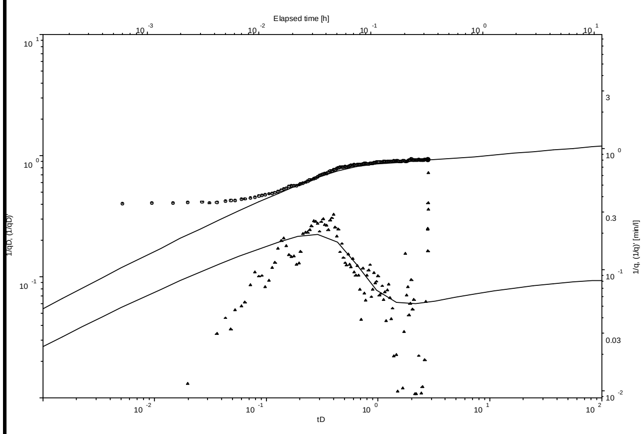
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070417 19:54
Test section from - to (m):	620.00-640.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

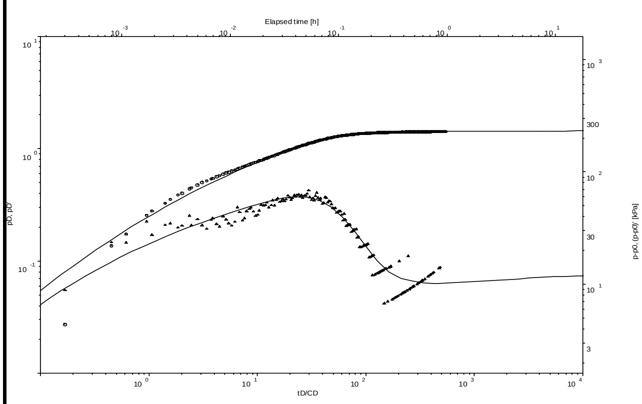


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4847		
p_i (kPa) =	4849		
p_p(kPa) =	5078	p_F (kPa) =	4849
Q_p (m^3/s)=	2.05E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.2		
Derivative fact.=	0.05	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	8.8E-07		
T_M (m^2/s)=	9.2E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	10.05	dt_1 (min) =	1.85
dt_2 (min) =	16.79	dt_2 (min) =	4.33
T (m^2/s) =	6.5E-07	T (m^2/s) =	2.3E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.3E-08	K_s (m/s) =	1.2E-08
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	9.3E-10
C_D (-) =	NA	C_D (-) =	1.0E-01
ξ (-) =	-5.3	ξ (-) =	-4.6
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) =	1.85	C (m^3/Pa) =	9.3E-10
dt_2 (min) =	4.33	C_D (-) =	1.0E-01
T_T (m^2/s) =	2.3E-07	ξ (-) =	-4.6
S (-) =	1.0E-06		
K_s (m/s) =	1.2E-08		
S_s (1/m) =	5.0E-08		

Comments:

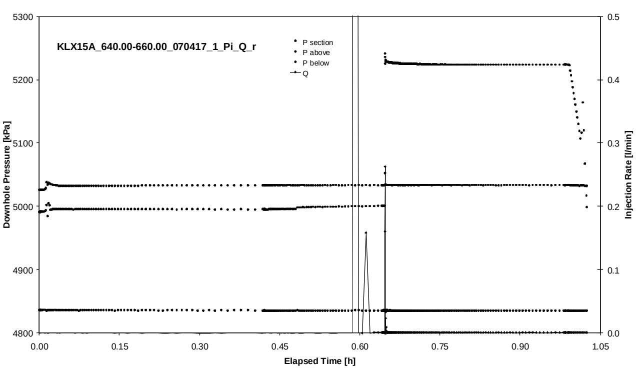
The recommended transmissivity of 2.3E-07 m2/s was derived from the analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-08 m2/s to 3.0E-06 m2/s. The flow dimension displayed during the test is 2. 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 4,845.7 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070417 22:57
Test section from - to (m):	640.00-660.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	4992		
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)=	14.4		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

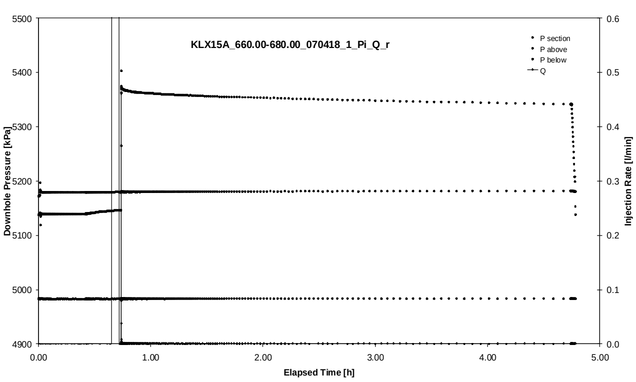
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070418 00:38
Test section from - to (m):	660.00-680.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

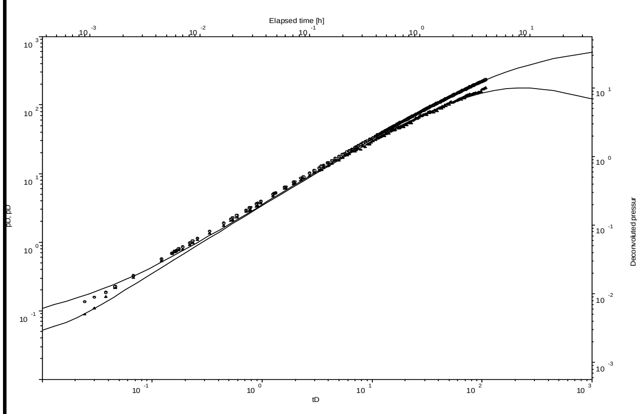


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5138		
p_i (kPa) =	5146		
p_p(kPa) =	5373	p_F (kPa) =	5342
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	14400
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.6		0.05
Derivative fact.=	NA	Derivative fact.=	
Results		**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) =	3.9E-10
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	2.0E-11
S_s (1/m) =	NA	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.1E-11
C_D (-) =	NA	C_D (-) =	5.6E-03
ξ (-) =	NA	ξ (-) =	-1.8
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

Nor Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	NA	C (m^3/Pa) =	5.1E-11
dt_2 (min) =	NA	C_D (-) =	5.6E-03
T_T (m^2/s) =	3.9E-10	ξ (-) =	-1.8
S (-) =	1.0E-06		
K_s (m/s) =	2.0E-11		
S_s (1/m) =	5.0E-08		

Comments:

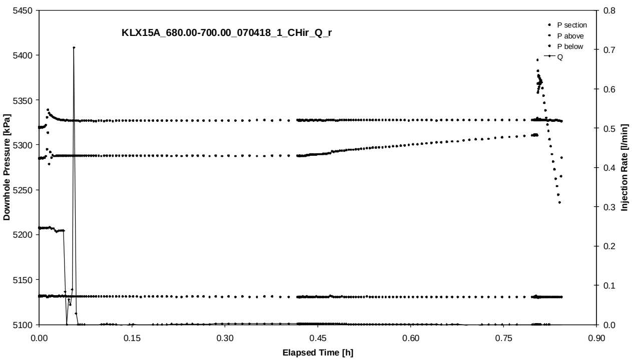
The recommended transmissivity of 3.9E-10 m2/s was derived from the analysis of the Pi phase (inner zone). The confidence range for the interval transmissivity is estimated to be 1.0E-12 to 8.0E-10 m2/s. This range encompasses the outer zone transmissivity and is based on the results of the appropriate 5 m tests. The analysis was conducted using a flow dimension of 2. The static pressure could not be extrapolated due to the very low transmissivity.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070418 06:55
Test section from - to (m):	680.00-700.00	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	5285		
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)=	14.9		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

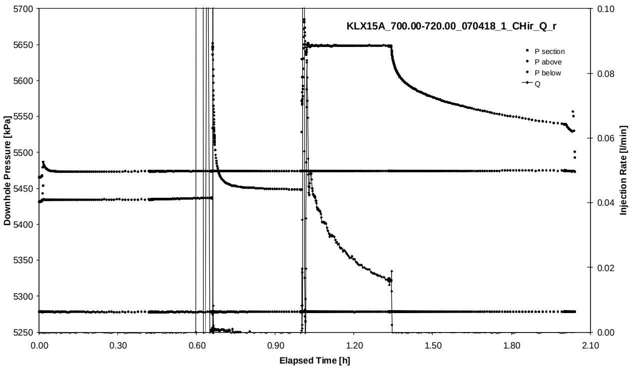
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

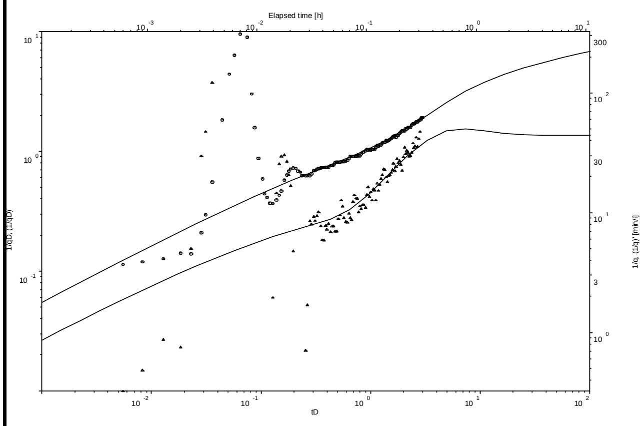
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070418 08:32
Test section from - to (m):	700.00-720.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

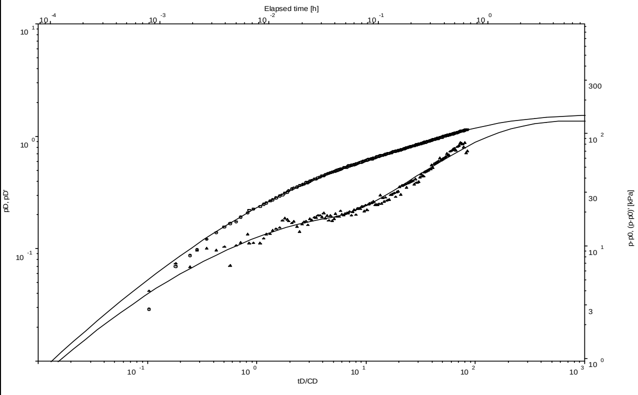


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5432		
p_i (kPa) =	5448		
p_p(kPa) =	5648	p_F (kPa) =	5540
Q_p (m^3/s)=	2.67E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.1		
Derivative fact.=	0.07	Derivative fact.=	0.06
Results		**Results**	
Q/s (m^2/s)=	1.3E-08		
T_M (m^2/s)=	1.4E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	0.98
dt_2 (min) =	NA	dt_2 (min) =	2.99
T (m^2/s) =	4.0E-09	T (m^2/s) =	8.1E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.0E-10	K_s (m/s) =	4.1E-10
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.4E-10
C_D (-) =	NA	C_D (-) =	1.6E-02
ξ (-) =	-3.5	ξ (-) =	-3.7
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	0.98	C (m^3/Pa) =	1.4E-10
dt_2 (min) =	2.99	C_D (-) =	1.6E-02
T_T (m^2/s) =	8.1E-09	ξ (-) =	-3.7
S (-) =	1.0E-06		
K_s (m/s) =	4.1E-10		
S_s (1/m) =	5.0E-08		

Comments:

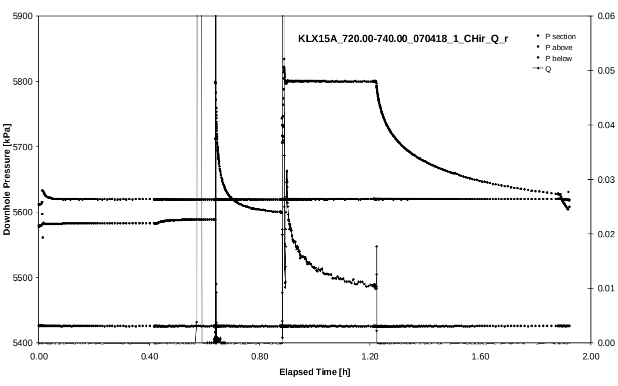
The recommended transmissivity of 8.1E-09 m2/s was derived from the analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-09 m2/s to 3.0E-08 m2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the low transmissivity.

[1] According to SKB MD 320.004 appendix 3.

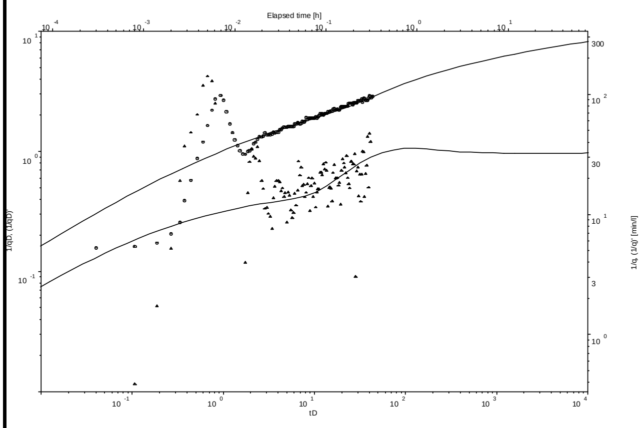
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070418 11:25
Test section from - to (m):	720.00-740.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

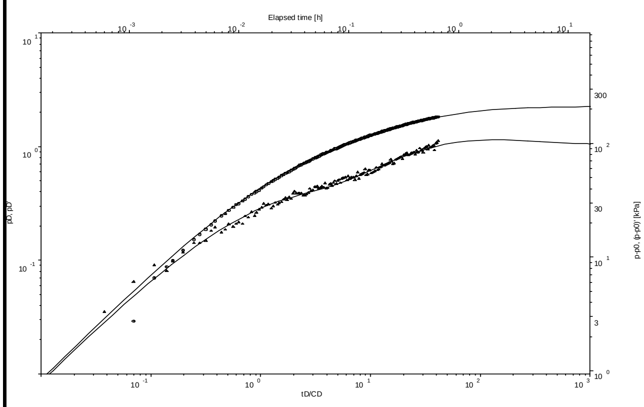
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5579		
p_i (kPa) =	5600		
p_p(kPa) =	5799	p_F (kPa) =	5628
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)=	15.4		
Derivative fact.=	0.07	Derivative fact.=	0.04
Results		**Results**	
Q/s (m^2/s)=	8.2E-09		
T_M (m^2/s)=	8.6E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	1.18
dt_2 (min) =	NA	dt_2 (min) =	4.69
T (m^2/s) =	3.9E-09	T (m^2/s) =	4.2E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.0E-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) =	1.5E-10
C_D (-) =	NA	C_D (-) =	1.7E-02
ξ (-) =	-2.1	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

Selected representative parameters.			
dt_1 (min) =	1.18	C (m^3/Pa) =	1.5E-10
dt_2 (min) =	4.69	C_D (-) =	1.7E-02
T_T (m^2/s) =	4.2E-09	ξ (-) =	-2.6
S (-) =	1.0E-06		
K_s (m/s) =	2.1E-10		
S_s (1/m) =	5.0E-08		

Comments:

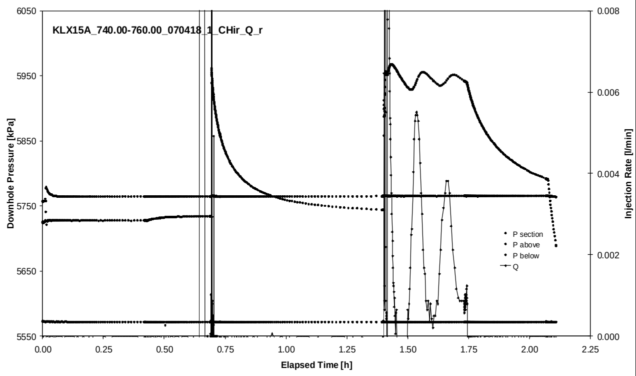
The recommended transmissivity of 4.2E-09 m2/s was derived from the analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-09 m2/s to 1.0E-08 m2/s. The flow dimension displayed during the test is 2. 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 5,590.2 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070418 14:06
Test section from - to (m):	740.00-760.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

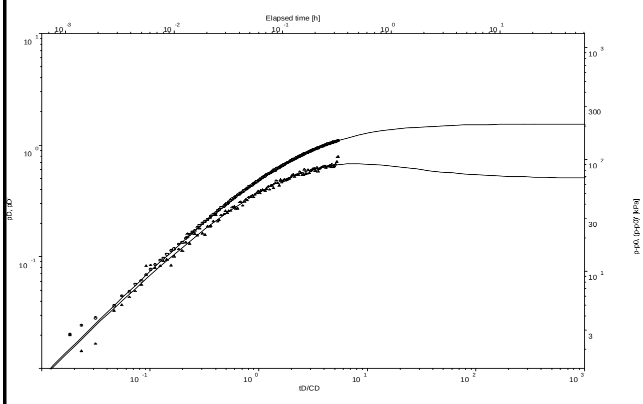


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5727		
p_i (kPa) =	5744		
p_p(kPa) =	5938	p_F (kPa) =	5791
Q_p (m^3/s)=	1.67E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.6		
Derivative fact.=	NA	Derivative fact.=	0.04
Results		**Results**	
Q/s (m^2/s)=	8.4E-10		
T_M (m^2/s)=	8.8E-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) =	NA	T (m^2/s) =	6.1E-10
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	3.1E-11
S_s (1/m) =	NA	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	8.4E-11
C_D (-) =	NA	C_D (-) =	9.3E-03
ξ (-) =	NA	ξ (-) =	-1.7
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

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) =	8.4E-11
dt_2 (min) =	NA	C_D (-) =	9.3E-03
T_T (m^2/s) =	6.1E-10	ξ (-) =	-1.7
S (-) =	1.0E-06		
K_s (m/s) =	3.1E-11		
S_s (1/m) =	5.0E-08		

Comments:

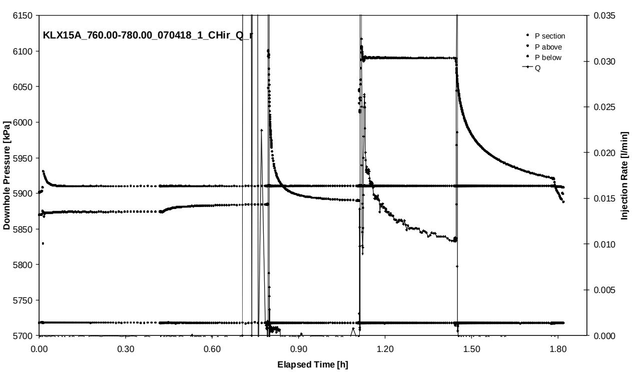
The recommended transmissivity of 6.1E-10 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 2.0E-10 m2/s to 1.0E-09 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,731.5 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

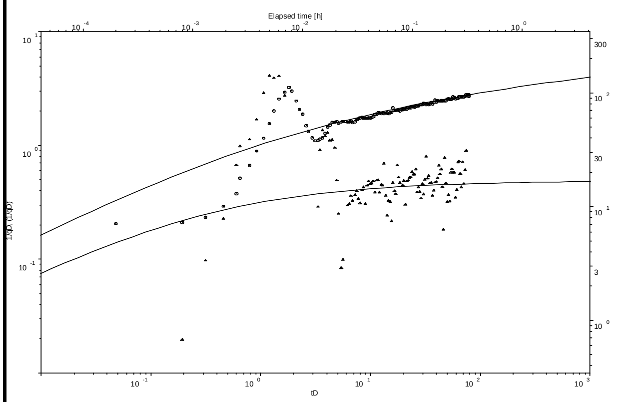
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070418 16:45
Test section from - to (m):	760.00-780.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

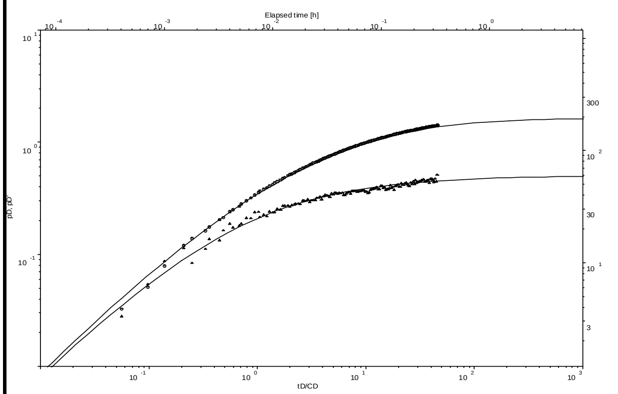


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5870		
p_i (kPa) =	5889		
p_p(kPa) =	6089	p_F (kPa) =	5921
Q_p (m^3/s)=	1.83E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.8		
Derivative fact.=	0.07	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	9.0E-09		
T_M (m^2/s)=	9.4E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2.02	dt_1 (min) =	1.87
dt_2 (min) =	15.69	dt_2 (min) =	17.43
T (m^2/s) =	3.8E-09	T (m^2/s) =	3.0E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.9E-10	K_s (m/s) =	1.5E-10
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 (-) =	-1.8	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) =	1.87	C (m^3/Pa) =	5.0E-11
dt_2 (min) =	17.43	C_D (-) =	5.6E-03
T_T (m^2/s) =	3.0E-09	ξ (-) =	-2.6
S (-) =	1.0E-06		
K_s (m/s) =	1.5E-10		
S_s (1/m) =	5.0E-08		

Comments:

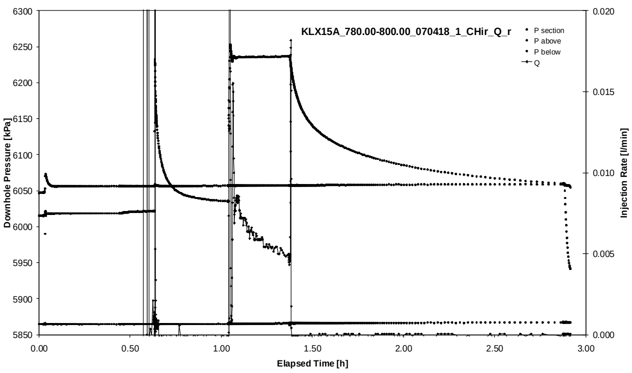
The recommended transmissivity of 3.0E-09 m2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-10 m2/s to 6.0E-09 m2/s. The flow dimension displayed during the test is 2. 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 5,881.5 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

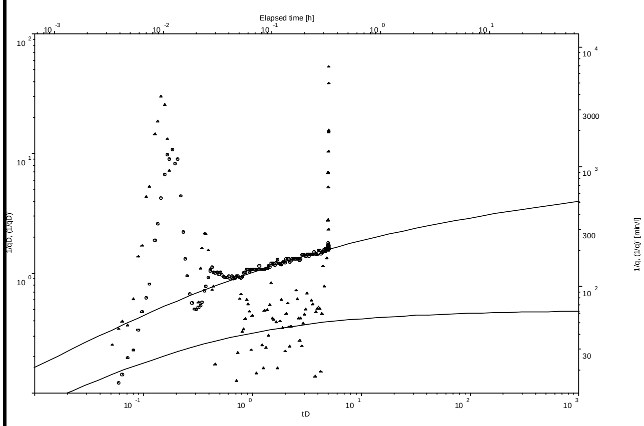
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070418 19:14
Test section from - to (m):	780.00-800.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

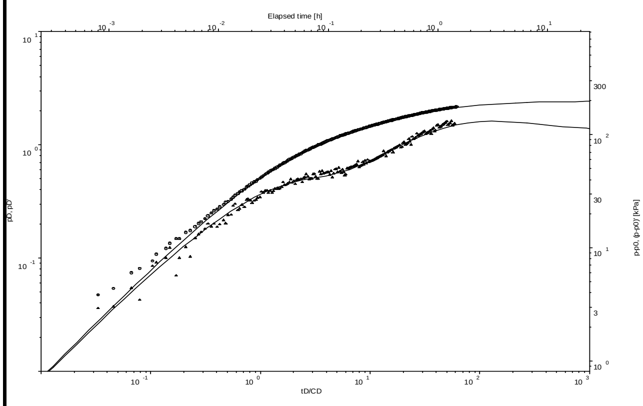


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6015		
p_i (kPa) =	6034		
p_p(kPa) =	6236	p_F (kPa) =	6061
Q_p (m^3/s)=	8.33E-08		
tp (s) =	1200	t_F (s) =	5400
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16.1		
Derivative fact.=	0.05	Derivative fact.=	0.04
Results		**Results**	
Q/s (m^2/s)=	4.0E-09		
T_M (m^2/s)=	4.2E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	3.52	dt_1 (min) =	2.33
dt_2 (min) =	14.02	dt_2 (min) =	10.66
T (m^2/s) =	1.0E-09	T (m^2/s) =	2.3E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.0E-11	K_s (m/s) =	1.2E-10
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.3E-10
C_D (-) =	NA	C_D (-) =	1.4E-02
ξ (-) =	-2.6	ξ (-) =	-1.9
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) =	2.33	C (m^3/Pa) =	1.3E-10
dt_2 (min) =	10.66	C_D (-) =	1.4E-02
T_T (m^2/s) =	2.3E-09	ξ (-) =	-1.9
S (-) =	1.0E-06		
K_s (m/s) =	1.2E-10		
S_s (1/m) =	5.0E-08		

Comments:

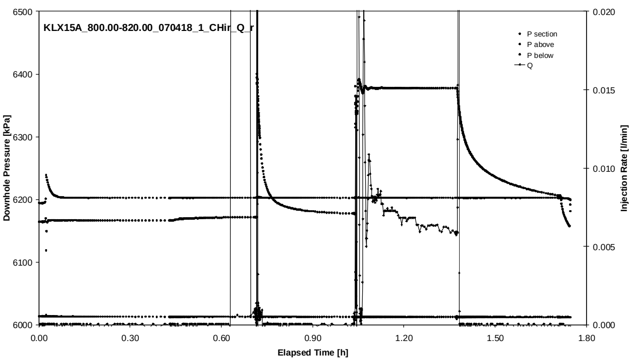
The recommended transmissivity of 2.3E-09 m2/s was derived from the analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7.0E-10 m2/s to 5.0E-09 m2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the low transmissivity.

[1] According to SKB MD 320.004 appendix 3.

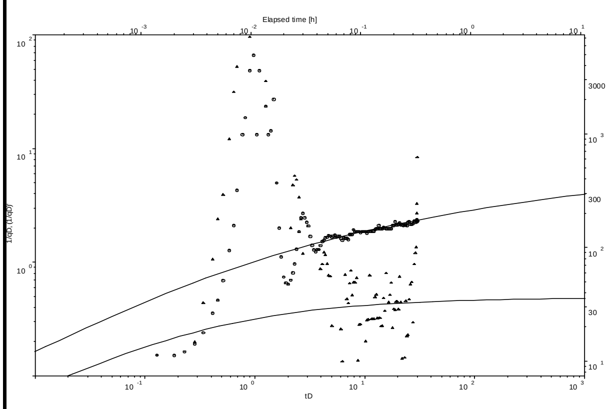
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070418 23:26
Test section from - to (m):	800.00-820.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

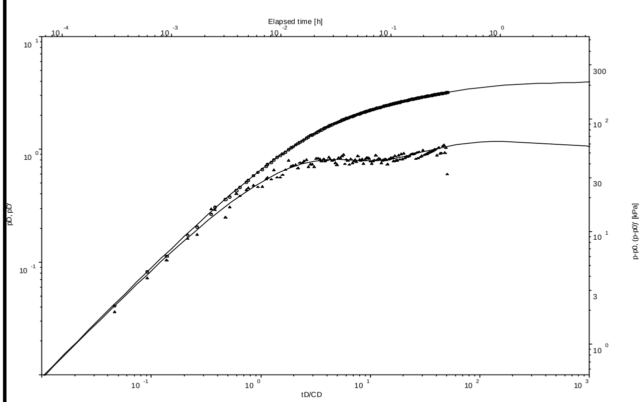
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	6164		
p_i (kPa) =	6177		
p_p(kPa) =	6378	p_F (kPa) =	6206
Q_p (m^3/s)=	1.00E-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)=	16.3		
Derivative fact.=	0.07	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	4.9E-09		
T_M (m^2/s)=	5.1E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	4.42	dt_1 (min) =	0.98
dt_2 (min) =	16.85	dt_2 (min) =	6.30
T (m^2/s) =	1.8E-09	T (m^2/s) =	3.8E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	8.8E-11	K_s (m/s) =	1.9E-10
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.7E-11
C_D (-) =	NA	C_D (-) =	6.3E-03
ξ (-) =	-1.9	ξ (-) =	-0.9
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Selected representative parameters.

dt_1 (min) =	0.98	C (m^3/Pa) =	5.7E-11
dt_2 (min) =	6.30	C_D (-) =	6.3E-03
T_T (m^2/s) =	3.8E-09	ξ (-) =	-0.9
S (-) =	1.0E-06		
K_s (m/s) =	1.9E-10		
S_s (1/m) =	5.0E-08		

Comments:

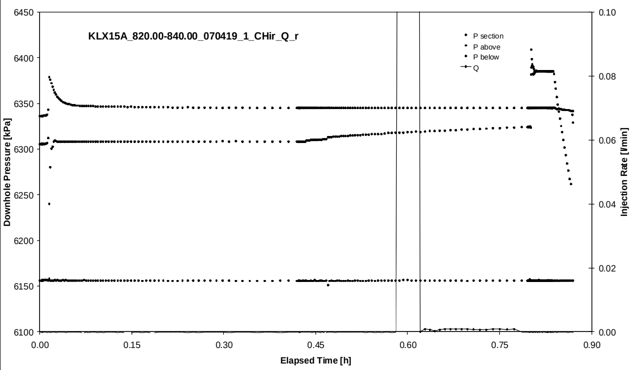
The recommended transmissivity of 3.8E-09 m2/s was derived from the analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-09 m2/s to 8.0E-09 m2/s. The flow dimension displayed during the test is 2. 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 6,163.3 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070419 01:51
Test section from - to (m):	820.00-840.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	6306		
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)=	16.6		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

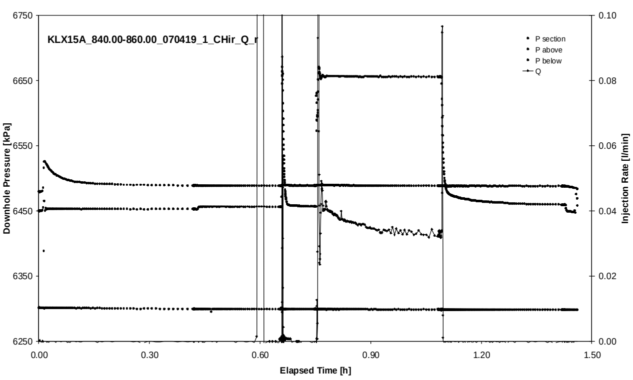
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

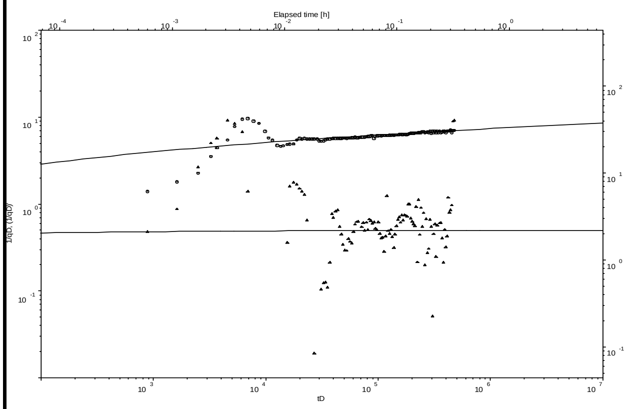
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070419 07:59
Test section from - to (m):	840.00-860.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2\cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

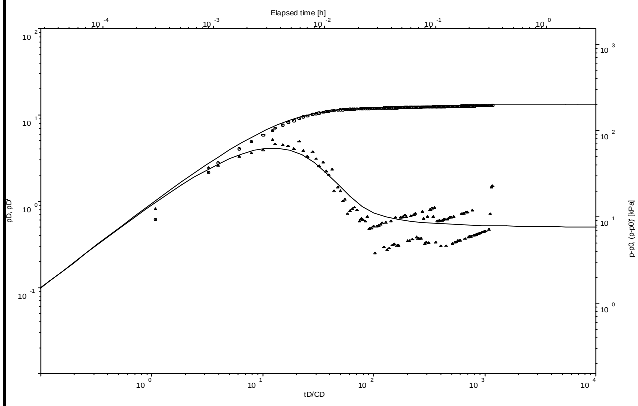
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6450		
p_i (kPa) =	6457		
p_p(kPa) =	6655	p_F (kPa) =	6459
Q_p (m^3/s)=	5.33E-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)=	16.8		
Derivative fact.=	0.11	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.6E-08		
T_M (m^2/s)=	2.8E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.97	dt_1 (min) =	2.11
dt_2 (min) =	15.74	dt_2 (min) =	15.68
T (m^2/s) =	3.0E-08	T (m^2/s) =	6.1E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.5E-09	K_s (m/s) =	3.1E-09
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.9E-11
C_D (-) =	NA	C_D (-) =	4.3E-03
ξ (-) =	1.5	ξ (-) =	7.7
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) =	2.11	C (m^3/Pa) =	3.9E-11
dt_2 (min) =	15.68	C_D (-) =	4.3E-03
T_T (m^2/s) =	6.1E-08	ξ (-) =	7.7
S (-) =	1.0E-06		
K_s (m/s) =	3.1E-09		
S_s (1/m) =	5.0E-08		

Comments:

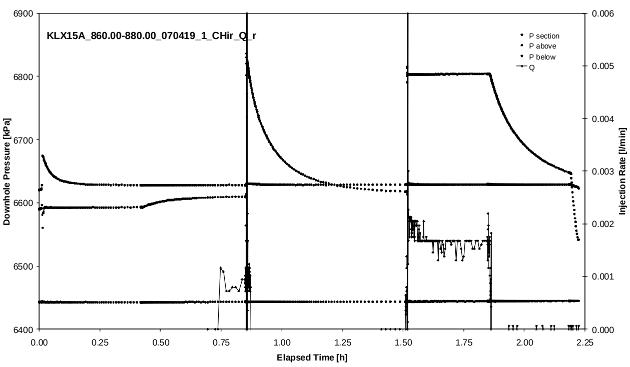
The recommended transmissivity of 6.1E-08 m2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 2.0E-08 m2/s to 1.0E-07 m2/s. The flow dimension displayed during the test is 2. 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 6,453.7 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

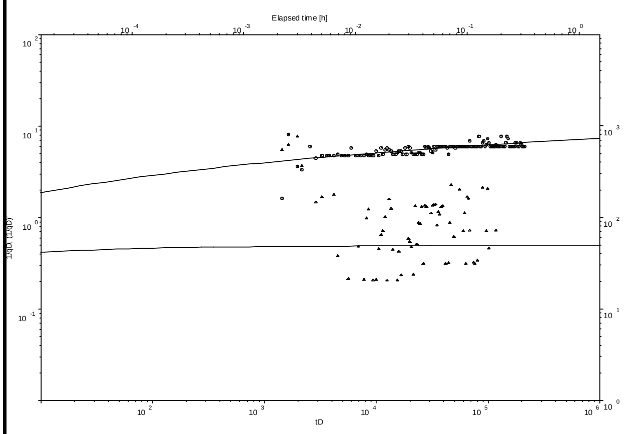
Project:	Oskarshamn site investigation	[Test type:[1]](#)	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070419 10:19
Test section from - to (m):	860.00-880.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

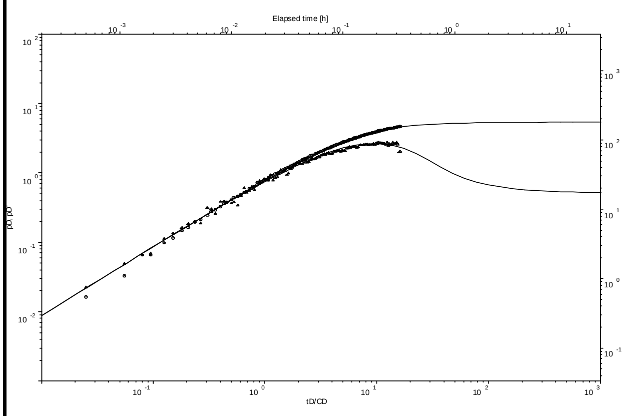


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6590		
p_i (kPa) =	6617		
p_p(kPa) =	6804	p_F (kPa) =	6646
Q_p (m^3/s)=	2.83E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	17.0		
Derivative fact.=	0.17	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	1.5E-09		
T_M (m^2/s)=	1.6E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.64	dt_1 (min) =	NA
dt_2 (min) =	9.44	dt_2 (min) =	NA
T (m^2/s) =	1.4E-09	T (m^2/s) =	1.3E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	7.0E-11	K_s (m/s) =	6.5E-11
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 (-) =	6.7E-03
ξ (-) =	2.6	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) =	0.64	C (m^3/Pa) =	6.1E-11
dt_2 (min) =	9.44	C_D (-) =	6.7E-03
T_T (m^2/s) =	1.4E-09	ξ (-) =	2.6
S (-) =	1.0E-06		
K_s (m/s) =	7.0E-11		
S_s (1/m) =	5.0E-08		

Comments:

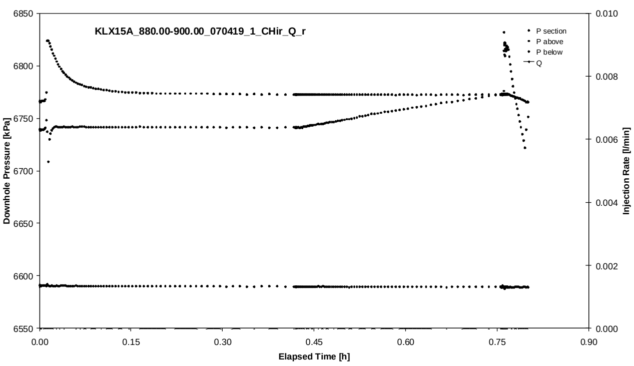
The recommended transmissivity of 1.4E-09 m2/s was derived from the analysis of the CHi phase, which shows the better horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be 5.0E-10 m2/s to 6.0E-09 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6,616.6 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070419 14:46
Test section from - to (m):	880.00-900.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	6739		
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)=	17.2		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

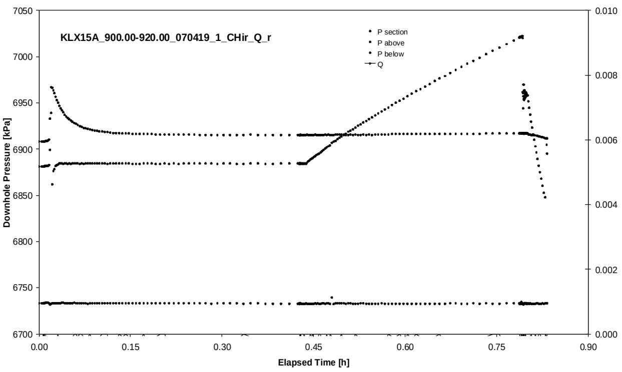
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070419 16:30
Test section from - to (m):	900.00-920.00	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	6881		
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)=	17.5		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

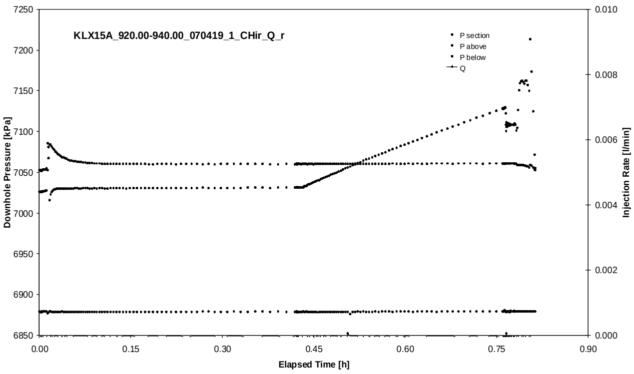
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070419 17:52
Test section from - to (m):	920.00-940.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	7026		
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)=	17.7		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

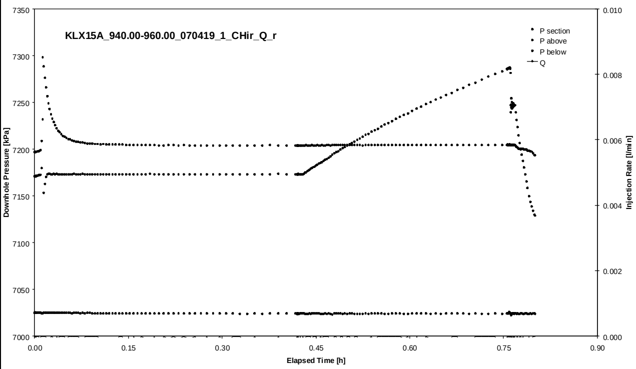
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070419 20:42
Test section from - to (m):	940.00-960.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	7171		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

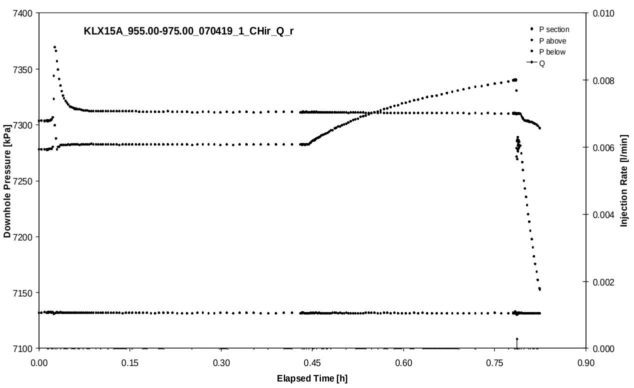
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070419 22:03
Test section from - to (m):	955.00-975.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	7278		
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)=	18.1		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

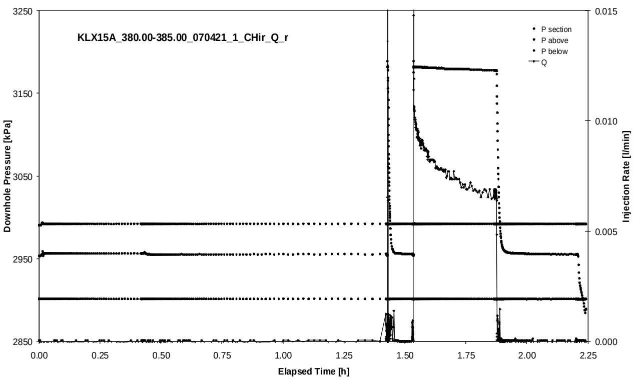
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

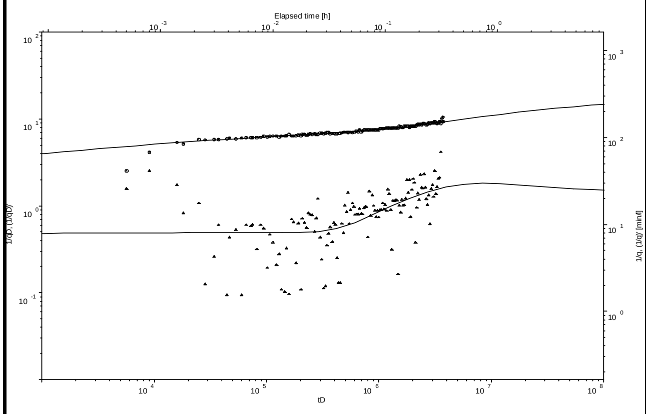
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070421 12:18
Test section from - to (m):	380.00-385.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

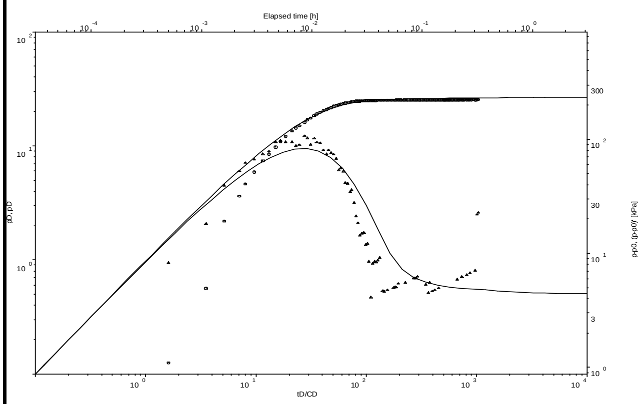


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2953		
p_i (kPa) =	2955		
p_p(kPa) =	3178	p_F (kPa) =	2955
Q_p (m^3/s)=	1.10E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.1		
Derivative fact.=	0.09	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	4.8E-09		
T_M (m^2/s)=	4.0E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.23	dt_1 (min) =	NA
dt_2 (min) =	2.45	dt_2 (min) =	NA
T (m^2/s) =	7.1E-09	T (m^2/s) =	2.3E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.4E-09	K_s (m/s) =	4.6E-09
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.7E-11
C_D (-) =	NA	C_D (-) =	1.8E-03
ξ (-) =	3.3	ξ (-) =	21.6
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) =	0.23	C (m^3/Pa) =	1.7E-11
dt_2 (min) =	2.45	C_D (-) =	1.8E-03
T_T (m^2/s) =	7.1E-09	ξ (-) =	3.3
S (-) =	1.0E-06		
K_s (m/s) =	1.4E-09		
S_s (1/m) =	2.0E-07		

Comments:

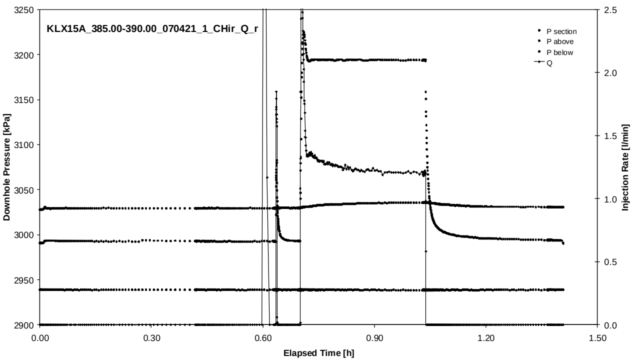
The recommended transmissivity of 7.1E-09 m2/s was derived from the analysis of the CHi phase (inner zone), which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-09 m2/s to 4.0E-08 m2/s. The flow dimension displayed during the test is 2. 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 2,954.4 kPa.

[1] According to SKB MD 320.004 appendix 3.

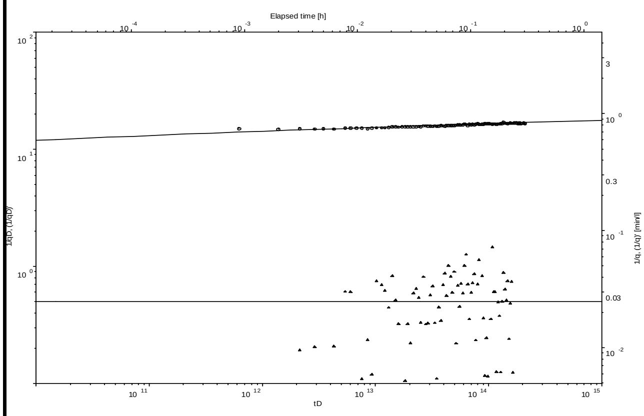
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070421 15:06
Test section from - to (m):	385.00-390.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

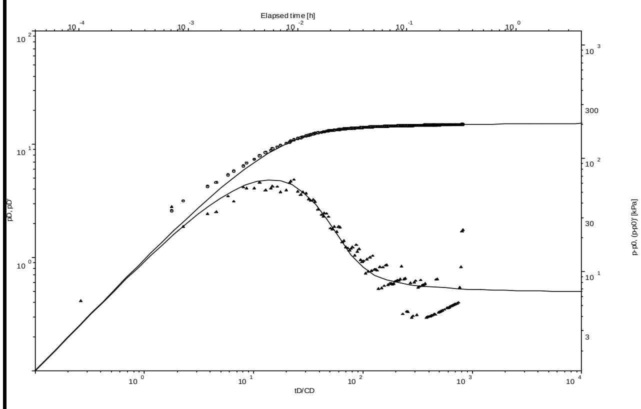
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2991		
p_i (kPa) =	2992		
p_p(kPa) =	3192	p_F (kPa) =	2993
Q_p (m^3/s)=	2.00E-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)=	11.2		
Derivative fact.=	0.09	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	9.8E-07		
T_M (m^2/s)=	8.1E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.17	dt_1 (min) =	3.67
dt_2 (min) =	13.01	dt_2 (min) =	14.97
T (m^2/s) =	2.6E-06	T (m^2/s) =	2.4E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.3E-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) =	2.2E-09
C_D (-) =	NA	C_D (-) =	2.4E-01
ξ (-) =	9.2	ξ (-) =	7.6
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) =	1.17	C (m^3/Pa) =	2.2E-09
dt_2 (min) =	13.01	C_D (-) =	2.4E-01
T_T (m^2/s) =	2.6E-06	ξ (-) =	9.2
S (-) =	1.0E-06		
K_s (m/s) =	5.3E-07		
S_s (1/m) =	2.0E-07		

Comments:

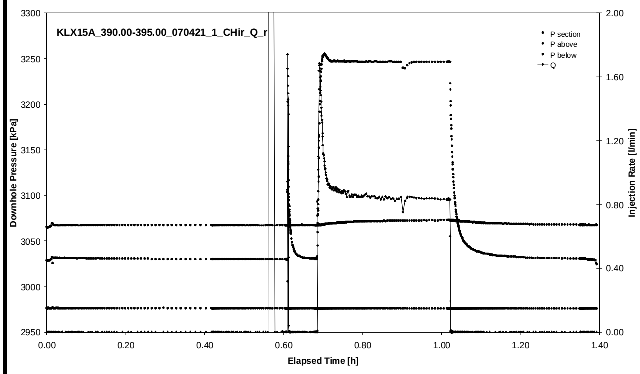
The recommended transmissivity of 2.6E-06 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-06 m2/s to 4.0E-06 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 2,989.7 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

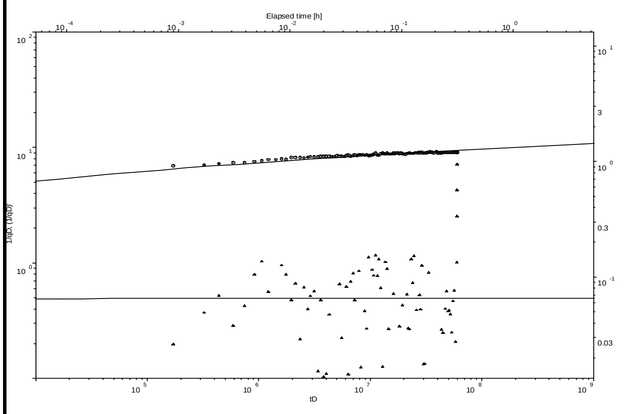
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070421 16:56
Test section from - to (m):	390.00-395.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

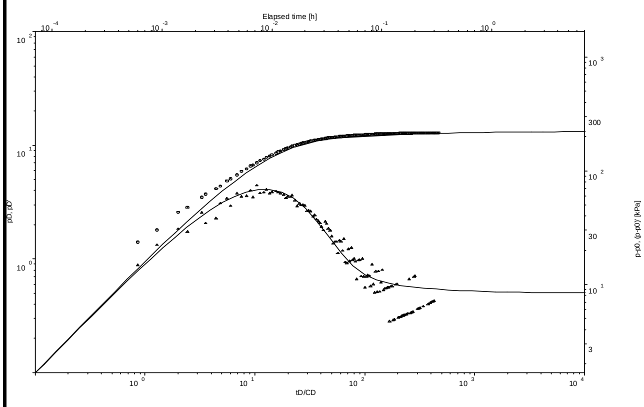


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3028		
p_i (kPa) =	3030		
p_p(kPa) =	3246	p_F (kPa) =	3030
Q_p (m^3/s)=	1.38E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.3		
Derivative fact.=	0.06	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	6.3E-07		
T_M (m^2/s)=	5.2E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.59	dt_1 (min) =	NA
dt_2 (min) =	16.60	dt_2 (min) =	NA
T (m^2/s) =	9.1E-07	T (m^2/s) =	1.3E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.8E-07	K_s (m/s) =	2.7E-07
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.2E-09
C_D (-) =	NA	C_D (-) =	2.4E-01
ξ (-) =	2.2	ξ (-) =	5.7
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0.59	C (m^3/Pa) =	2.2E-09
dt_2 (min) =	16.60	C_D (-) =	2.4E-01
T_T (m^2/s) =	9.1E-07	ξ (-) =	2.2
S (-) =	1.0E-06		
K_s (m/s) =	1.8E-07		
S_s (1/m) =	2.0E-07		

Comments:

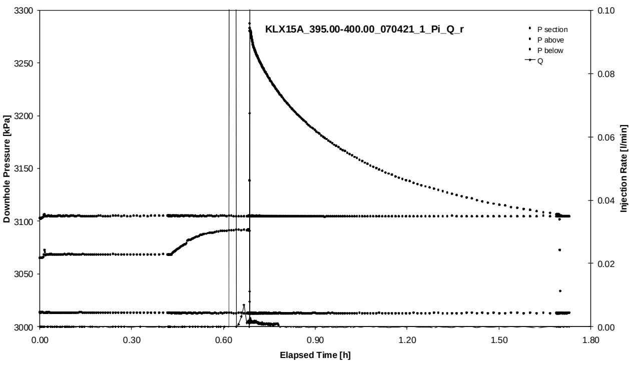
The recommended transmissivity of 9.1E-07 m2/s was derived from the analysis of the CHi phase, which shows the best derivative quality and horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be 5.0E-07 m2/s to 2.0E-06 m2/s. The flow dimension displayed during the test is 2. 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 3,027.3 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070421 18:45
Test section from - to (m):	395.00-400.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

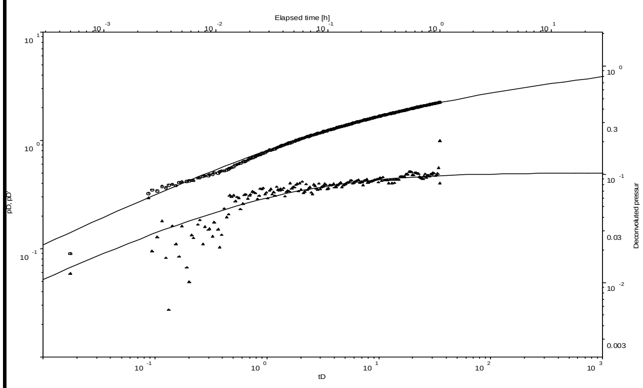


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3065		
p_i (kPa) =	3091		
p_p(kPa) =	3287	p_F (kPa) =	3106
Q_p (m^3/s)=	NA		
tp (s) =	10.2	t_F (s) =	3600
S el S^* (-)=	NA	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.3		
Derivative fact.=	NA	Derivative fact.=	0.04
Results		**Results**	
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) =	3.09
dt_2 (min) =	NA	dt_2 (min) =	55.39
T (m^2/s) =	NA	T (m^2/s) =	3.5E-11
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	7.0E-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 (-) =	-0.5
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) =	3.09	C (m^3/Pa) =	1.7E-11
dt_2 (min) =	55.39	C_D (-) =	1.8E-03
T_T (m^2/s) =	3.5E-11	ξ (-) =	-0.5
S (-) =	1.0E-06		
K_s (m/s) =	7.0E-12		
S_s (1/m) =	2.0E-07		

Comments:

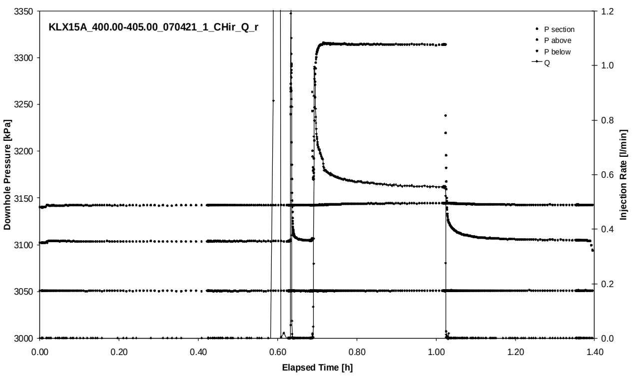
The recommended transmissivity of 3.5E-11 m2/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 1.0E-11 to 8.0E-11 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure could not be extrapolated due to the very low transmissivity.

[1] According to SKB MD 320.004 appendix 3.

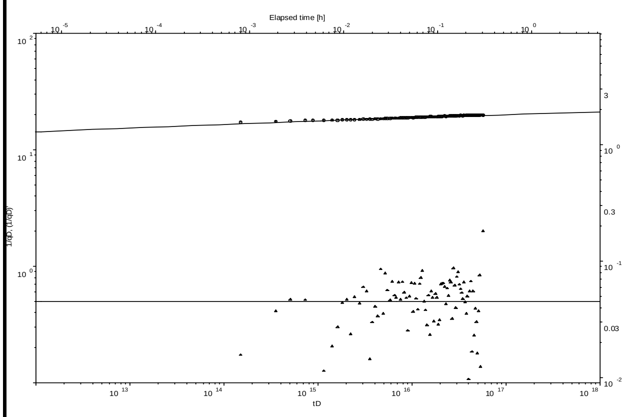
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070421 21:07
Test section from - to (m):	400.00-405.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

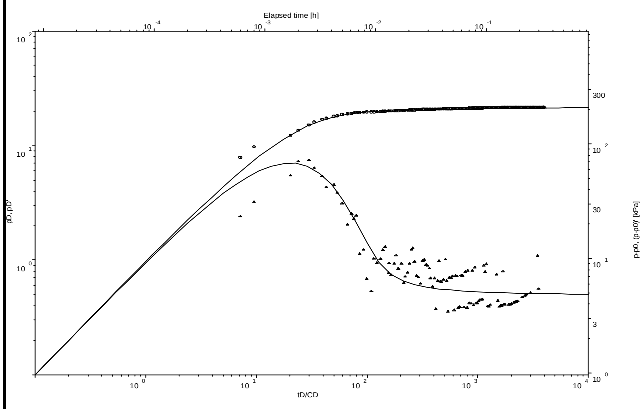
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3102		
p_i (kPa) =	3104		
p_p(kPa) =	3314	p_F (kPa) =	3105
Q_p (m^3/s)=	9.17E-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)=	11.4		
Derivative fact.=	0.07	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	4.3E-07		
T_M (m^2/s)=	3.5E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.62	dt_1 (min) =	1.11
dt_2 (min) =	15.11	dt_2 (min) =	11.06
T (m^2/s) =	1.4E-06	T (m^2/s) =	1.5E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.7E-07	K_s (m/s) =	3.1E-07
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.0E-10
C_D (-) =	NA	C_D (-) =	3.3E-02
ξ (-) =	12.4	ξ (-) =	14.4
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) =	1.11	C (m^3/Pa) =	3.0E-10
dt_2 (min) =	11.06	C_D (-) =	3.3E-02
T_T (m^2/s) =	1.5E-06	ξ (-) =	14.4
S (-) =	1.0E-06		
K_s (m/s) =	3.1E-07		
S_s (1/m) =	2.0E-07		

Comments:

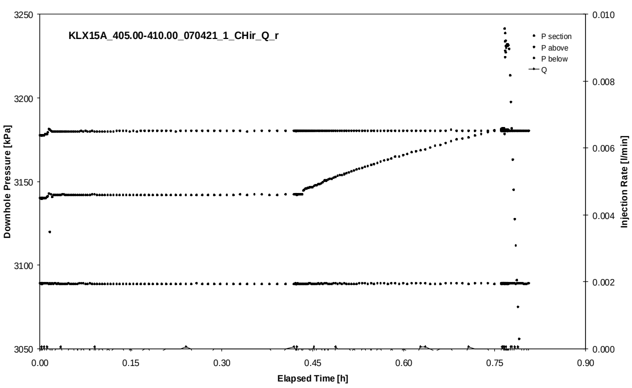
The recommended transmissivity of 1.5E-06 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-07 m2/s to 3.0E-06 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,103.1 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070421 22:58
Test section from - to (m):	405.00-410.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	3140		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

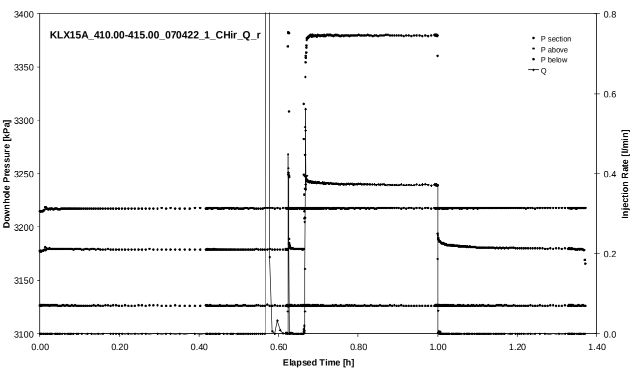
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

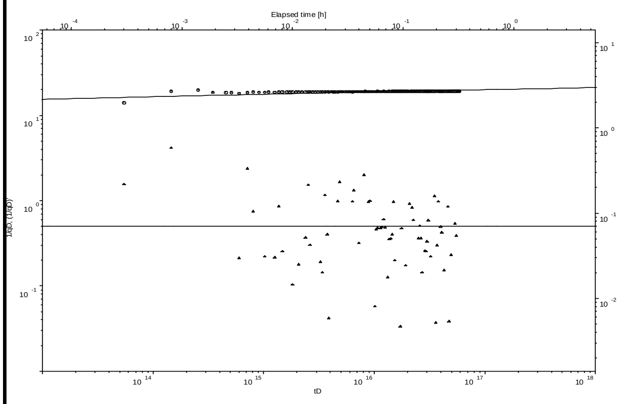
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070422 00:11
Test section from - to (m):	410.00-415.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

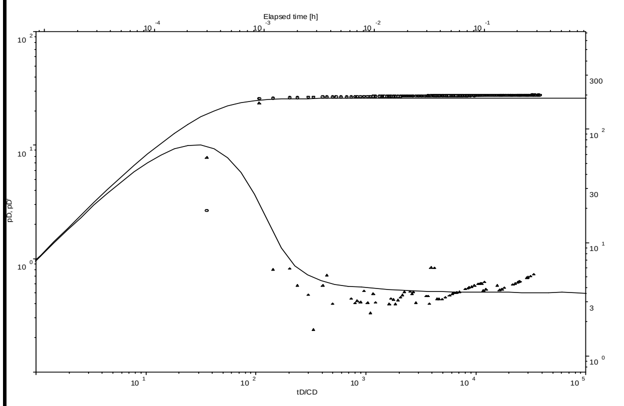


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3177		
p_i (kPa) =	3180		
p_p(kPa) =	3379	p_F (kPa) =	3180
Q_p (m^3/s)=	6.17E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.5		
Derivative fact.=	0.01	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	3.0E-07		
T_M (m^2/s)=	2.5E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.11	dt_1 (min) =	0.21
dt_2 (min) =	18.49	dt_2 (min) =	7.07
T (m^2/s) =	9.4E-07	T (m^2/s) =	1.4E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.9E-07	K_s (m/s) =	2.7E-07
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.6E-11
C_D (-) =	NA	C_D (-) =	2.9E-03
ξ (-) =	12.5	ξ (-) =	21.4
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) =	1.11	C (m^3/Pa) =	2.6E-11
dt_2 (min) =	18.49	C_D (-) =	2.9E-03
T_T (m^2/s) =	9.4E-07	ξ (-) =	12.5
S (-) =	1.0E-06		
K_s (m/s) =	1.9E-07		
S_s (1/m) =	2.0E-07		

Comments:

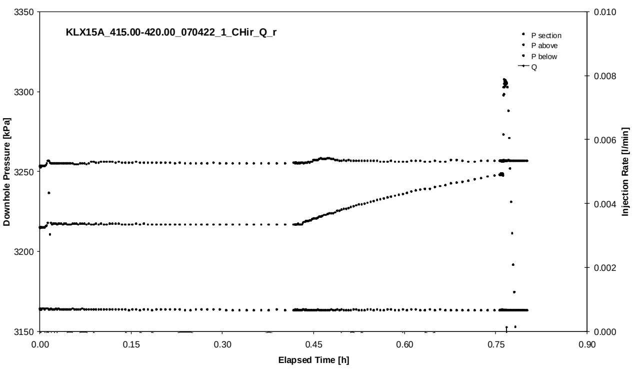
The recommended transmissivity of 9.4E-07 m2/s was derived from the analysis of the CHi phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5.0E-07 m2/s to 3.0E-06 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,178.6 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070422 06:38
Test section from - to (m):	415.00-420.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	3215		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

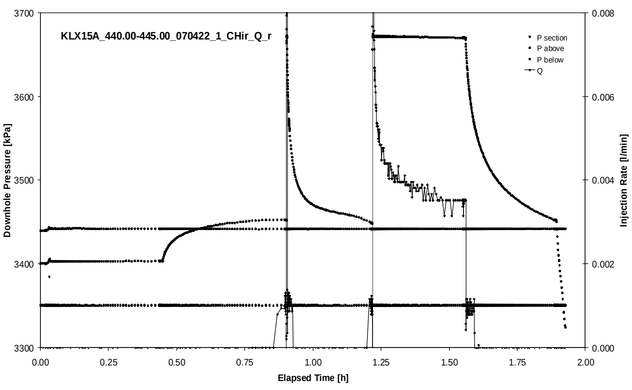
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

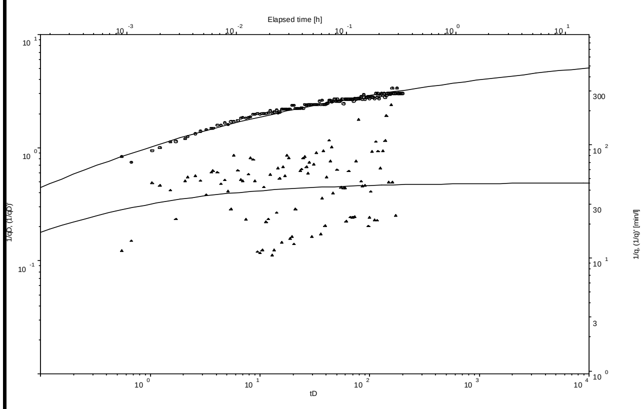
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070422 08:18
Test section from - to (m):	440.00-445.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

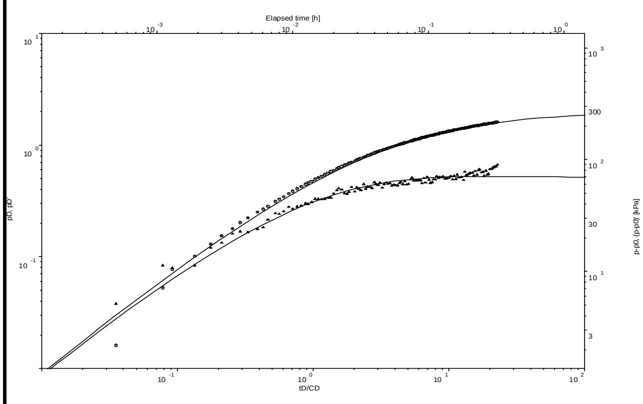
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3401		
p_i (kPa) =	3448		
p_p(kPa) =	3670	p_F (kPa) =	3452
Q_p (m^3/s)=	5.83E-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)=	11.8		
Derivative fact.=	0.04	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.6E-09		
T_M (m^2/s)=	2.1E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.04	dt_1 (min) =	1.83
dt_2 (min) =	14.83	dt_2 (min) =	15.58
T (m^2/s) =	1.2E-09	T (m^2/s) =	7.8E-10
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.5E-10	K_s (m/s) =	1.6E-10
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.6E-11
C_D (-) =	NA	C_D (-) =	2.8E-03
ξ (-) =	-0.8	ξ (-) =	-1.7
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) =	1.83	C (m^3/Pa) =	2.6E-11
dt_2 (min) =	15.58	C_D (-) =	2.8E-03
T_T (m^2/s) =	7.8E-10	ξ (-) =	-1.7
S (-) =	1.0E-06		
K_s (m/s) =	1.6E-10		
S_s (1/m) =	2.0E-07		

Comments:

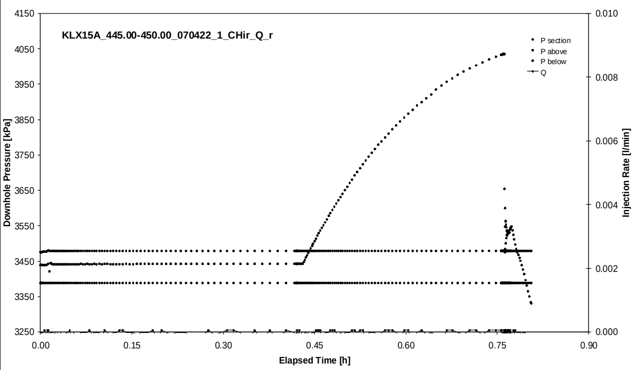
The recommended transmissivity of 7.8E-10 m2/s was derived from the analysis of the CHir phase, which shows the best data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5.0E-10 m2/s to 3.0E-09 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,405.1 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070422 10:48
Test section from - to (m):	445.00-450.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	3439		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

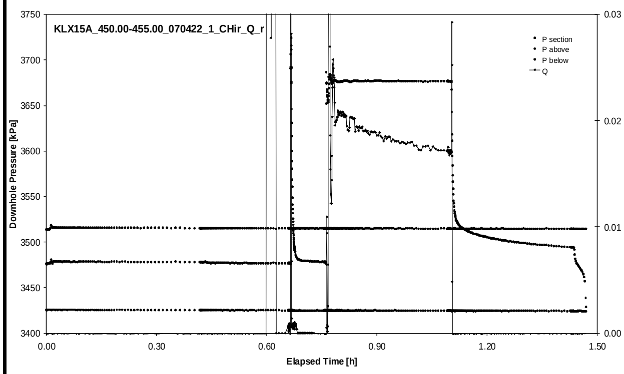
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

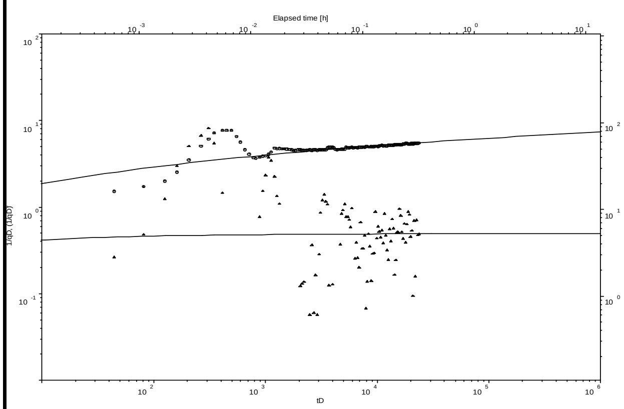
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070422 13:05
Test section from - to (m):	450.00-455.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

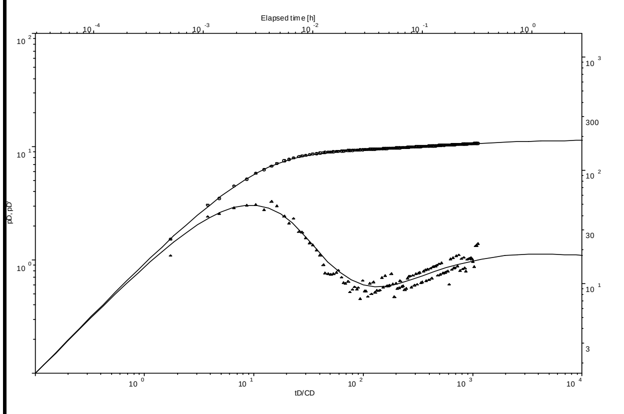


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3476		
p_i (kPa) =	3477		
p_p(kPa) =	3677	p_F (kPa) =	3494
Q_p (m^3/s)=	2.83E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12		
Derivative fact.=	0.05	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	1.4E-08		
T_M (m^2/s)=	1.1E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2.41	dt_1 (min) =	1.22
dt_2 (min) =	18.73	dt_2 (min) =	3.83
T (m^2/s) =	1.2E-08	T (m^2/s) =	3.0E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.4E-09	K_s (m/s) =	6.1E-09
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 (-) =	2.2E-03
ξ (-) =	0.4	ξ (-) =	5.4
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) =	2.41	C (m^3/Pa) =	2.0E-11
dt_2 (min) =	18.73	C_D (-) =	2.2E-03
T_T (m^2/s) =	1.2E-08	ξ (-) =	0.4
S (-) =	1.0E-06		
K_s (m/s) =	2.4E-09		
S_s (1/m) =	2.0E-07		

Comments:

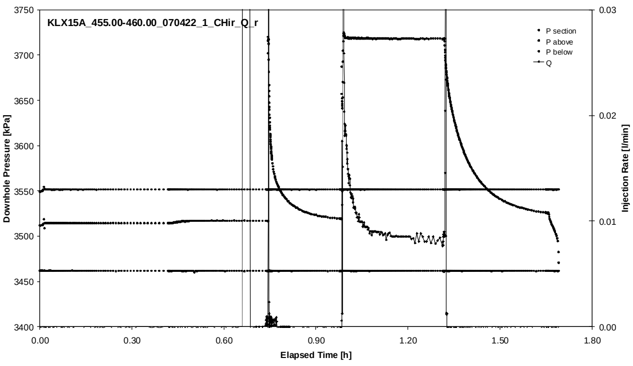
The recommended transmissivity of 1.2E-08 m2/s was derived from the analysis of the CHi phase, which shows the best horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be 8.0E-09 m2/s to 4.0E-08 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,481.8 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

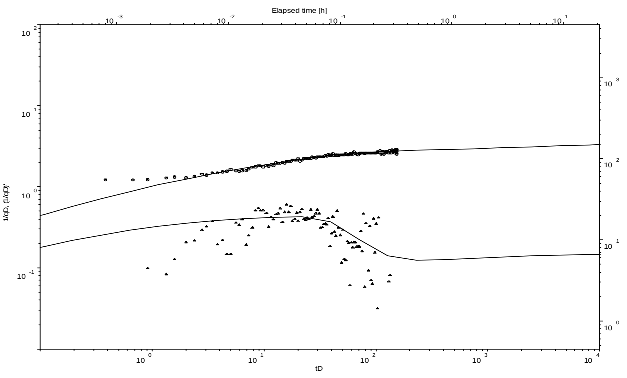
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070422 15:03
Test section from - to (m):	455.00-460.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

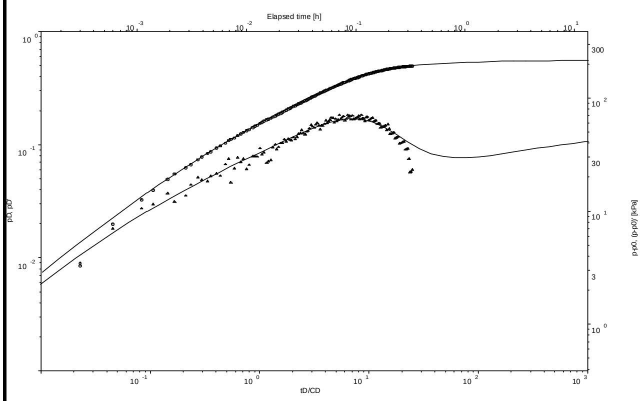


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3511		
p_i (kPa) =	3518		
p_p(kPa) =	3718	p_F (kPa) =	3525
Q_p (m^3/s)=	1.33E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.0		
Derivative fact.=	0.1	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	6.5E-09		
T_M (m^2/s)=	5.4E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.21	dt_1 (min) =	NA
dt_2 (min) =	3.88	dt_2 (min) =	NA
T (m^2/s) =	2.9E-09	T (m^2/s) =	2.4E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.8E-10	K_s (m/s) =	4.8E-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 (-) =	-1.4	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

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	1.21	C (m^3/Pa) =	1.9E-11
dt_2 (min) =	3.88	C_D (-) =	2.1E-03
T_T (m^2/s) =	2.9E-09	ξ (-) =	-1.4
S (-) =	1.0E-06		
K_s (m/s) =	5.8E-10		
S_s (1/m) =	2.0E-07		

Comments:

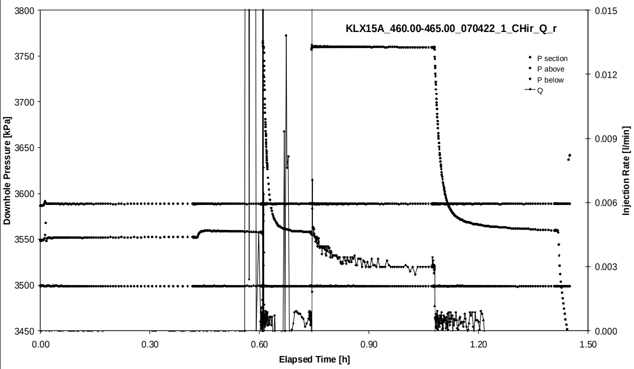
The recommended transmissivity of 2.9E-09 m2/s was derived from the analysis of the CHi phase (inner zone), which shows the best horizontal stabilisation. The confidence range for the interval transmissivity is estimated to be 7.0E-10 m2/s to 6.0E-09 m2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the low transmissivity.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

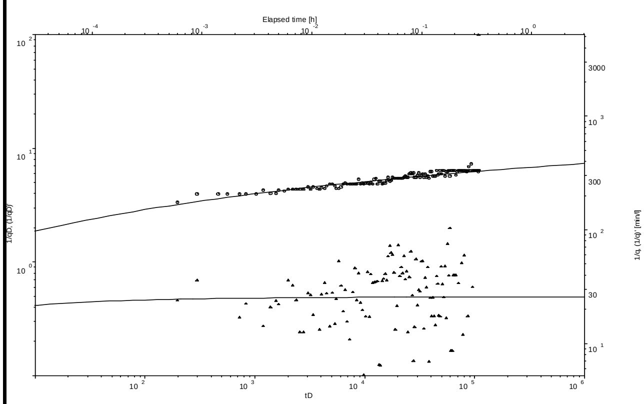
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070422 17:10
Test section from - to (m):	460.00-465.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

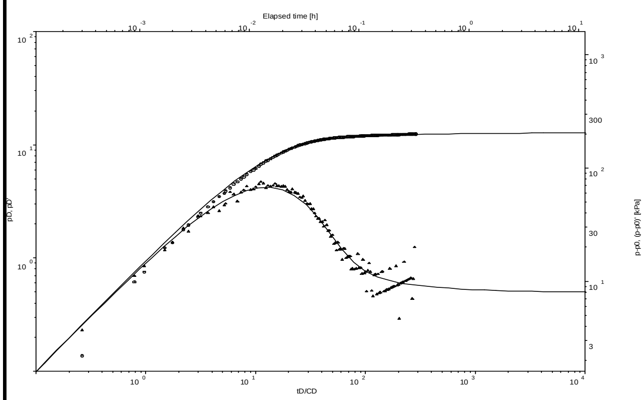


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3549		
p_i (kPa) =	3557		
p_p(kPa) =	3759	p_F (kPa) =	3559
Q_p (m^3/s)=	5.00E-08		
tp (s) =	1210	t_F (s) =	1200
S el S* (-)=	1.00E-06	S el S* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.1		
Derivative fact.=	0.19	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	2.4E-09		
T_M (m^2/s)=	2.0E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.40	dt_1 (min) =	8.83
dt_2 (min) =	15.62	dt_2 (min) =	18.86
T (m^2/s) =	2.5E-09	T (m^2/s) =	5.4E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.0E-10	K_s (m/s) =	1.1E-09
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.4E-11
C_D (-) =	NA	C_D (-) =	1.6E-03
ξ (-) =	2.0	ξ (-) =	8.2
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	8.83	C (m^3/Pa) =	1.4E-11
dt_2 (min) =	18.86	C_D (-) =	1.6E-03
T_T (m^2/s) =	5.4E-09	ξ (-) =	8.2
S (-) =	1.0E-06		
K_s (m/s) =	1.1E-09		
S_s (1/m) =	2.0E-07		

Comments:

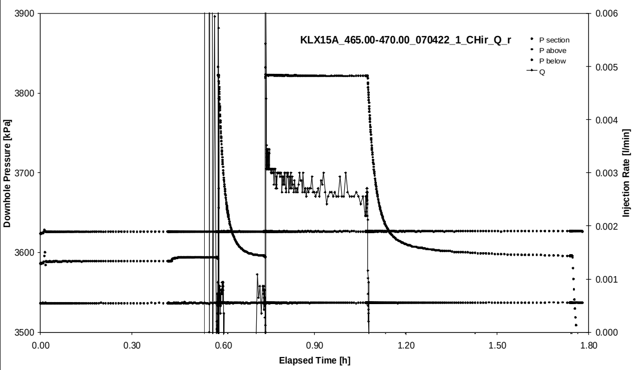
The recommended transmissivity of 5.4E-09 m2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 2.0E-09 m2/s to 8.0E-09 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,554.5 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

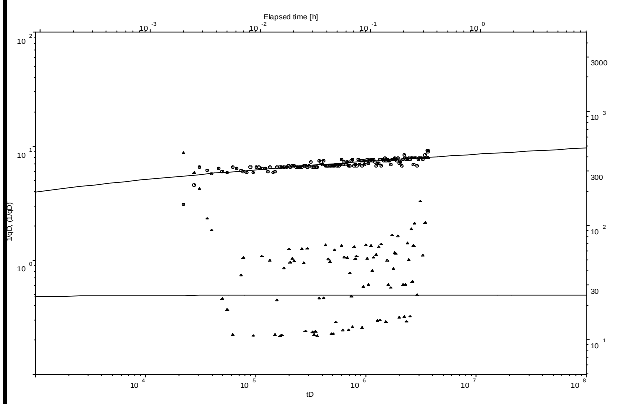
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070422 19:02
Test section from - to (m):	465.00-470.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

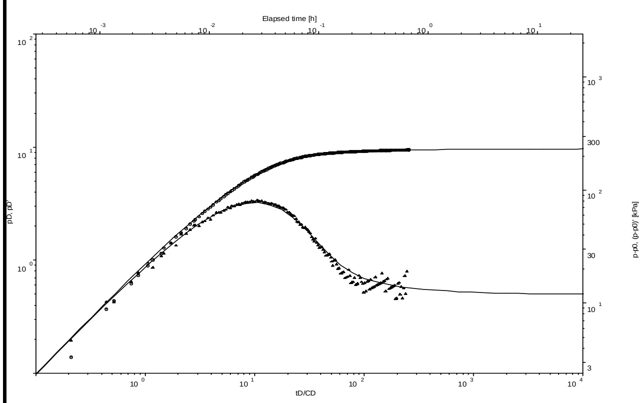


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3585		
p_i (kPa) =	3594		
p_p(kPa) =	3821	p_F (kPa) =	3594
Q_p (m^3/s)=	4.17E-08		
tp (s) =	1210	t_F (s) =	2400
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.1		
Derivative fact.=	0.14	Derivative fact.=	0.07
Results		**Results**	
Q/s (m^2/s)=	1.8E-09		
T_M (m^2/s)=	1.5E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.83	dt_1 (min) =	12.32
dt_2 (min) =	13.16	dt_2 (min) =	35.18
T (m^2/s) =	2.3E-09	T (m^2/s) =	2.9E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	4.6E-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) =	1.8E-11
C_D (-) =	NA	C_D (-) =	1.9E-03
ξ (-) =	3.8	ξ (-) =	5.4
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) =	12.32	C (m^3/Pa) =	1.8E-11
dt_2 (min) =	35.18	C_D (-) =	1.9E-03
T_T (m^2/s) =	2.9E-09	ξ (-) =	5.4
S (-) =	1.0E-06		
K_s (m/s) =	5.9E-10		
S_s (1/m) =	2.0E-07		

Comments:

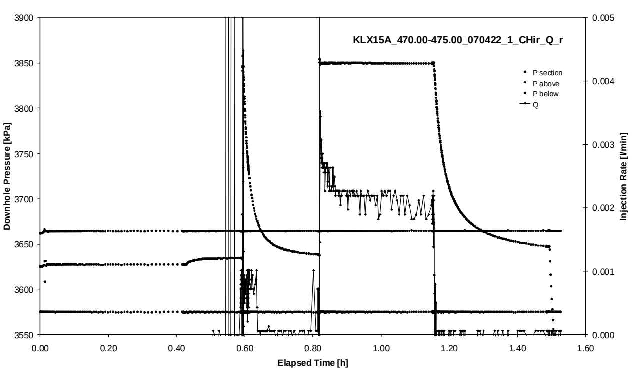
The recommended transmissivity of 2.9E-09 m2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-09 m2/s to 5.0E-09 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,589.7 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

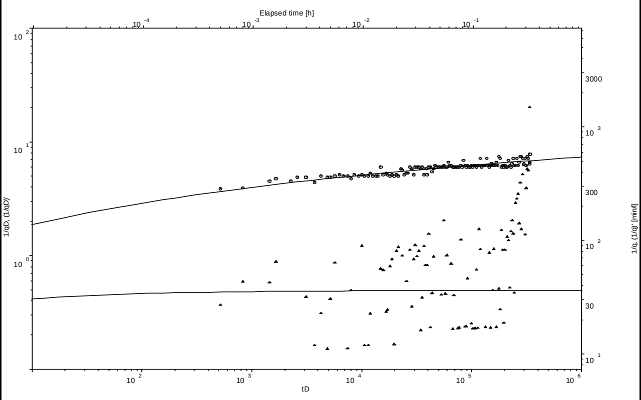
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070422 21:41
Test section from - to (m):	470.00-475.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

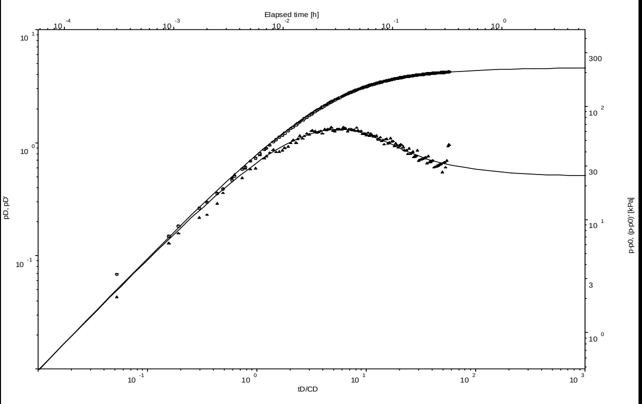


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3625		
p_i (kPa) =	3637		
p_p(kPa) =	3849	p_F (kPa) =	3647
Q_p (m^3/s)=	3.33E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.2		
Derivative fact.=	0.18	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	1.5E-09		
T_M (m^2/s)=	1.3E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.80	dt_1 (min) =	NA
dt_2 (min) =	10.18	dt_2 (min) =	NA
T (m^2/s) =	1.6E-09	T (m^2/s) =	1.2E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.3E-10	K_s (m/s) =	2.4E-10
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.6E-11
C_D (-) =	NA	C_D (-) =	1.7E-03
ξ (-) =	2.8	ξ (-) =	0.9
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) =	NA	C (m^3/Pa) =	1.6E-11
dt_2 (min) =	NA	C_D (-) =	1.7E-03
T_T (m^2/s) =	1.2E-09	ξ (-) =	0.9
S (-) =	1.0E-06		
K_s (m/s) =	2.4E-10		
S_s (1/m) =	2.0E-07		

Comments:

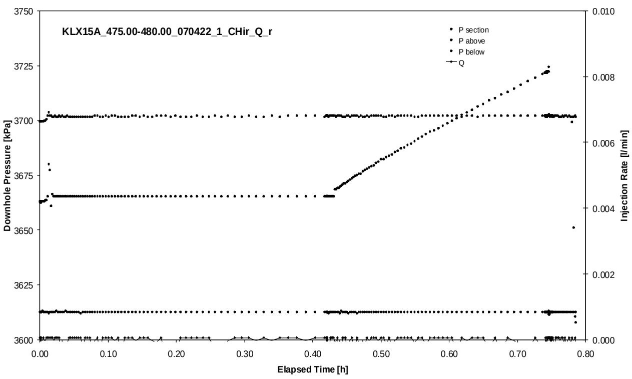
The recommended transmissivity of 1.2E-09 m2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-10 m2/s to 3.0E-09 m2/s. The flow dimension during the test was assumed to be 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 3,629.9 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070422 23:36
Test section from - to (m):	475.00-480.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	3662		
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)=	12.2		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

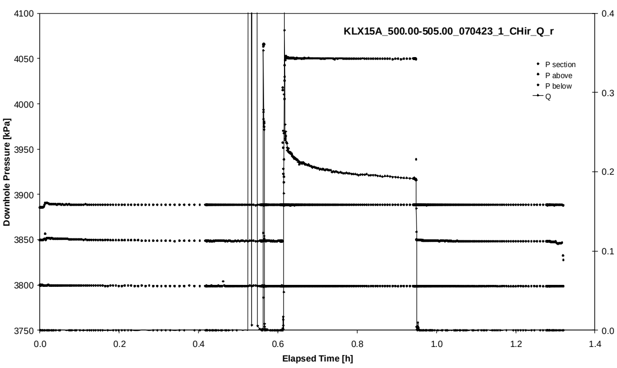
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

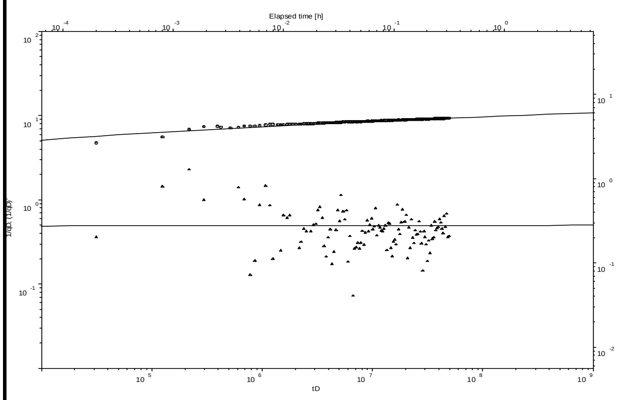
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070423 00:58
Test section from - to (m):	500.00-505.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

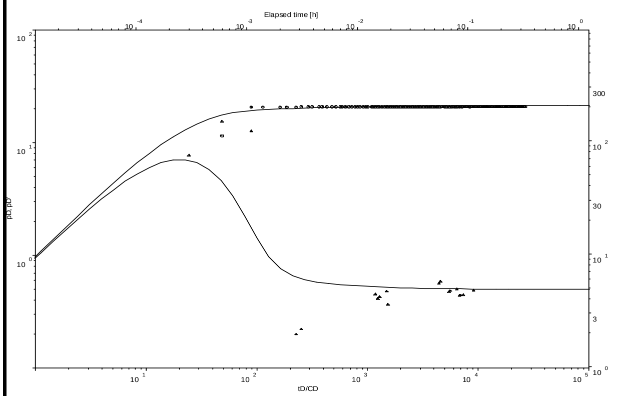


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3849		
p_i (kPa) =	3848		
p_p(kPa) =	4050	p_F (kPa) =	3848
Q_p (m^3/s)=	3.17E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.5		
Derivative fact.=	0.04	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.5E-07		
T_M (m^2/s)=	1.3E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.89	dt_1 (min) =	NA
dt_2 (min) =	16.16	dt_2 (min) =	NA
T (m^2/s) =	2.3E-07	T (m^2/s) =	5.5E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	4.6E-08	K_s (m/s) =	1.1E-07
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.6E-11
C_D (-) =	NA	C_D (-) =	1.7E-03
ξ (-) =	2.8	ξ (-) =	15.9
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) =	0.89	C (m^3/Pa) =	1.6E-11
dt_2 (min) =	16.16	C_D (-) =	1.7E-03
T_T (m^2/s) =	2.3E-07	ξ (-) =	2.8
S (-) =	1.0E-06		
K_s (m/s) =	4.6E-08		
S_s (1/m) =	2.0E-07		

Comments:

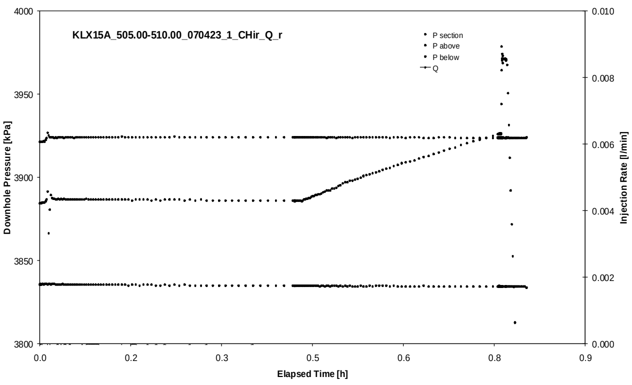
The recommended transmissivity of 2.3E-07 m2/s was derived from the analysis of the CHi phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 9.0E-08 m2/s to 6.0E-07 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 3,847.9 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070423 06:34
Test section from - to (m):	505.00-510.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	3885		
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)=	12.6		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

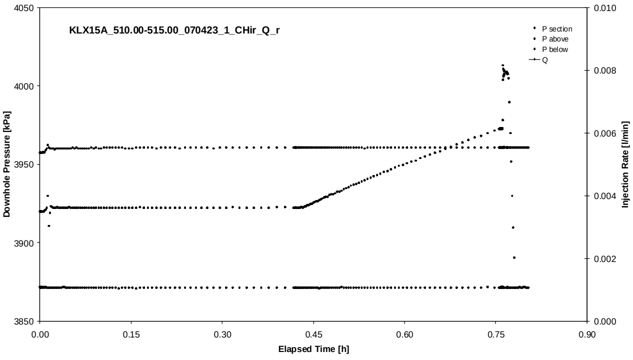
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070423 07:57
Test section from - to (m):	510.00-515.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	3920		
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)=	12.6		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

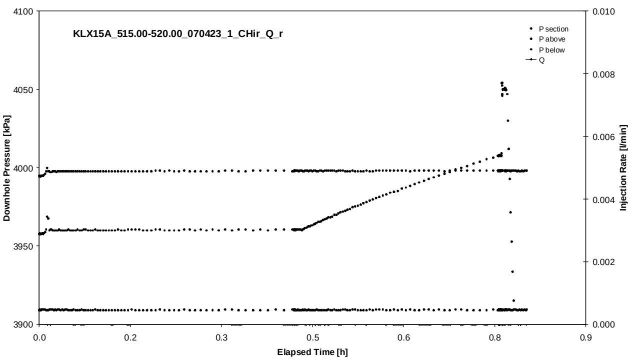
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070423 09:17
Test section from - to (m):	515.00-520.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	3958		
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)=	12.7		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

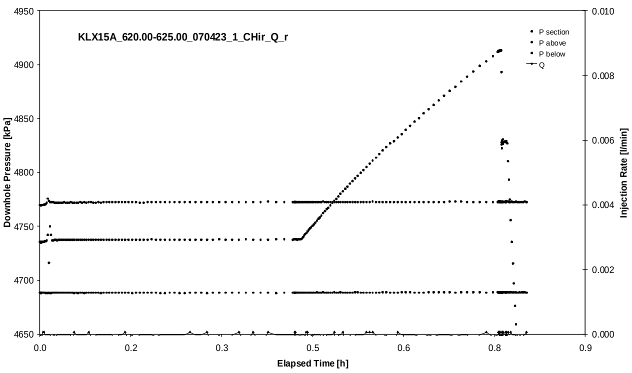
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070423 13:19
Test section from - to (m):	620.00-625.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	4735		
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)=	14.0		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

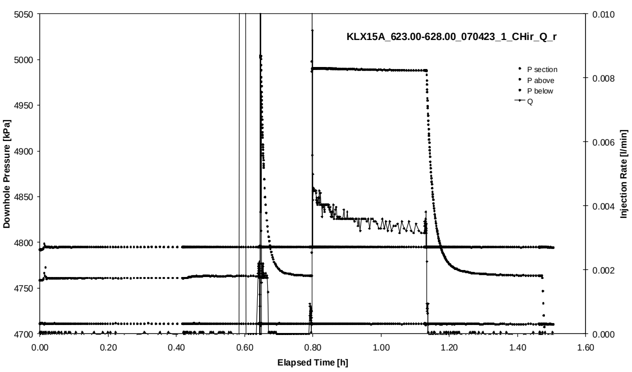
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

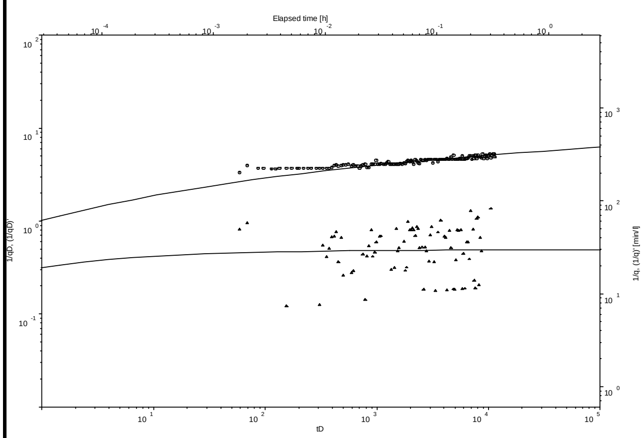
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070423 14:31
Test section from - to (m):	623.00-628.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

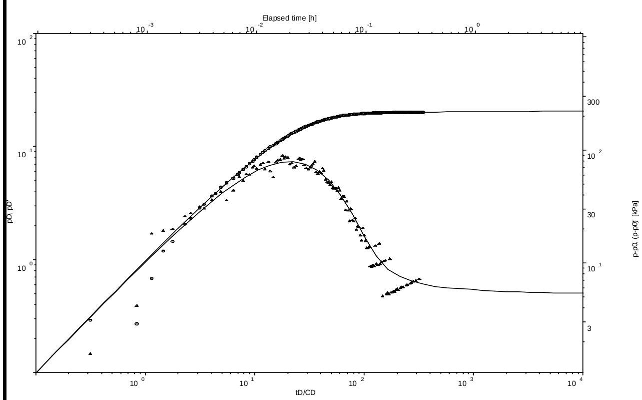
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4758		
p_i (kPa) =	4763		
p_p(kPa) =	4987	p_F (kPa) =	4763
Q_p (m^3/s)=	5.00E-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)=	NA		
Derivative fact.=	0.1	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.2E-09		
T_M (m^2/s)=	1.8E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.31	dt_1 (min) =	NA
dt_2 (min) =	14.93	dt_2 (min) =	NA
T (m^2/s) =	1.9E-09	T (m^2/s) =	8.7E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.8E-10	K_s (m/s) =	1.7E-09
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.9E-11
C_D (-) =	NA	C_D (-) =	2.1E-03
ξ (-) =	1.0	ξ (-) =	15.8
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) =	1.31	C (m^3/Pa) =	1.9E-11
dt_2 (min) =	14.93	C_D (-) =	2.1E-03
T_T (m^2/s) =	1.9E-09	ξ (-) =	1.0
S (-) =	1.0E-06		
K_s (m/s) =	3.8E-10		
S_s (1/m) =	2.0E-07		

Comments:

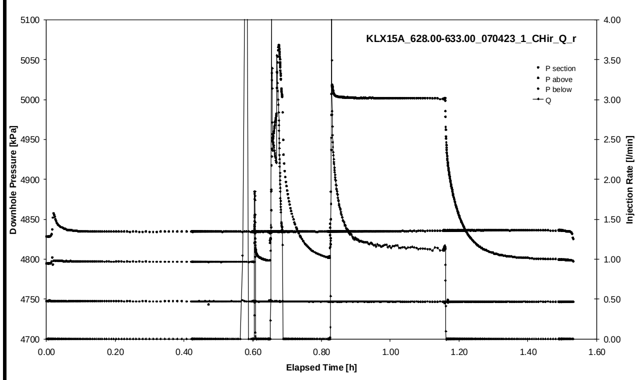
The recommended transmissivity of 1.9E-09 m2/s was derived from the analysis of the CHi phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-09 m2/s to 1.0E-08 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4,759.4 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

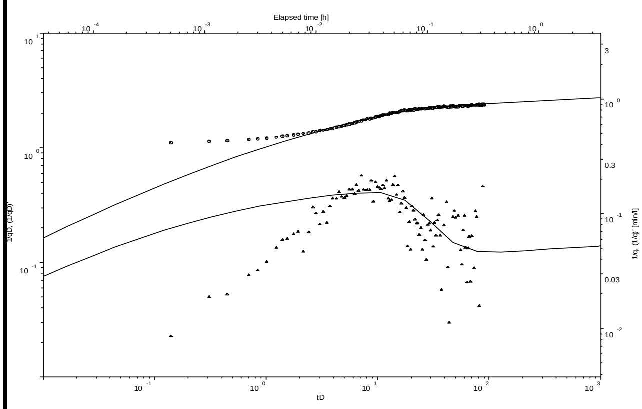
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070423 16:25
Test section from - to (m):	628.00-633.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

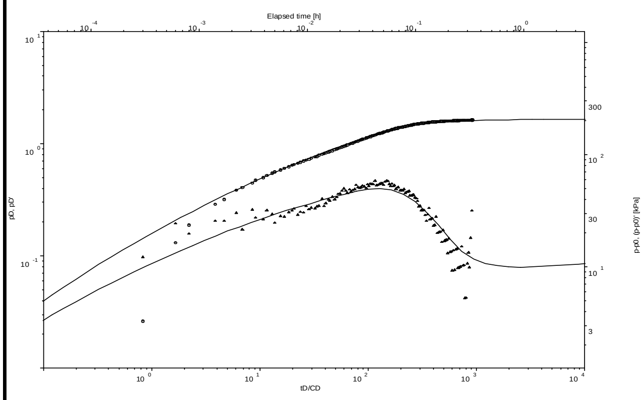


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4794		
p_i (kPa) =	4800		
p_p(kPa) =	5002	p_F (kPa) =	4798
Q_p (m^3/s)=	1.88E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	NA		
Derivative fact.=	0.05	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	9.1E-07		
T_M (m^2/s)=	7.5E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.92	dt_1 (min) =	1.82
dt_2 (min) =	2.88	dt_2 (min) =	3.71
T (m^2/s) =	3.4E-07	T (m^2/s) =	2.6E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	6.8E-08	K_s (m/s) =	5.2E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.2E-10
C_D (-) =	NA	C_D (-) =	2.4E-02
ξ (-) =	-4.0	ξ (-) =	-4.5
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) =	0.92	C (m^3/Pa) =	2.2E-10
dt_2 (min) =	2.88	C_D (-) =	2.4E-02
T_T (m^2/s) =	3.4E-07	ξ (-) =	-4.0
S (-) =	1.0E-06		
K_s (m/s) =	6.8E-08		
S_s (1/m) =	2.0E-07		

Comments:

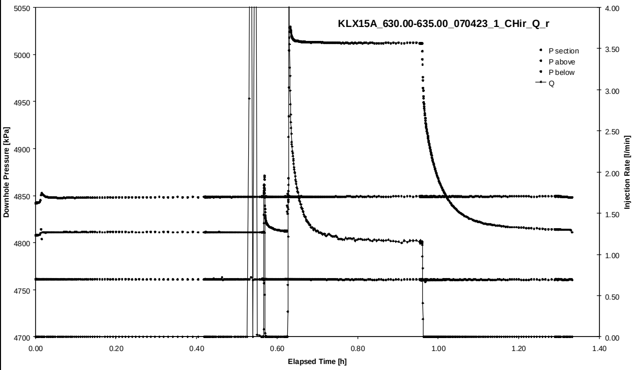
The recommended transmissivity of 3.4E-07 m2/s was derived from the analysis of the CHi phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-07 m2/s to 2.0E-06 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4,793.4 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

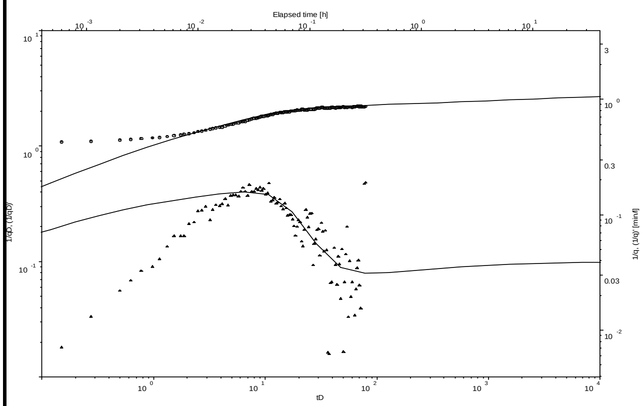
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070423 18:21
Test section from - to (m):	630.00-635.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

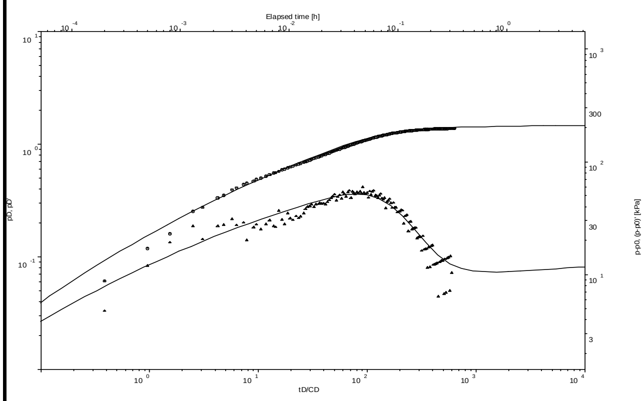


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4808		
p_i (kPa) =	4812		
p_p(kPa) =	5012	p_F (kPa) =	4813
Q_p (m^3/s)=	1.92E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	NA		
Derivative fact.=	0.09	Derivative fact.=	0.02
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) =	1.30	dt_1 (min) =	1.89
dt_2 (min) =	2.43	dt_2 (min) =	3.53
T (m^2/s) =	3.3E-07	T (m^2/s) =	2.3E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	6.6E-08	K_s (m/s) =	4.6E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.8E-10
C_D (-) =	NA	C_D (-) =	3.1E-02
ξ (-) =	-4.1	ξ (-) =	-4.6
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) =	1.30	C (m^3/Pa) =	2.8E-10
dt_2 (min) =	2.43	C_D (-) =	3.1E-02
T_T (m^2/s) =	3.3E-07	ξ (-) =	-4.1
S (-) =	1.0E-06		
K_s (m/s) =	6.6E-08		
S_s (1/m) =	2.0E-07		

Comments:

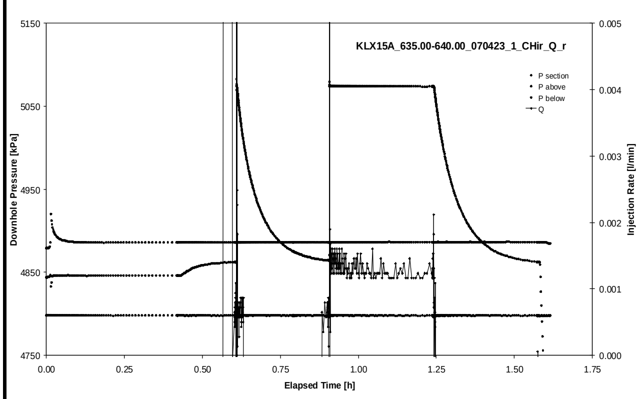
The recommended transmissivity of 3.3E-07 m2/s was derived from the analysis of the CHi phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 2.0E-07 m2/s to 3.0E-06 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4,806.1 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

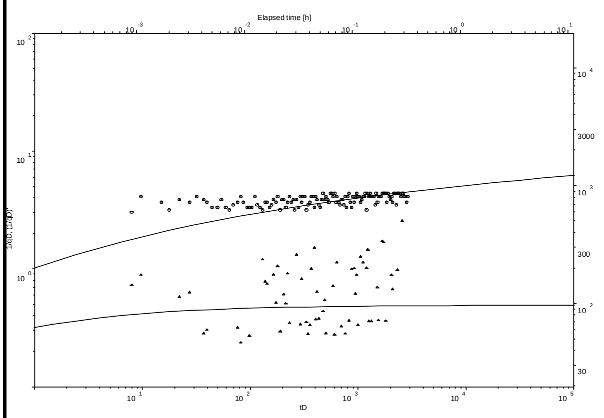
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070423 20:25
Test section from - to (m):	635.00-640.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

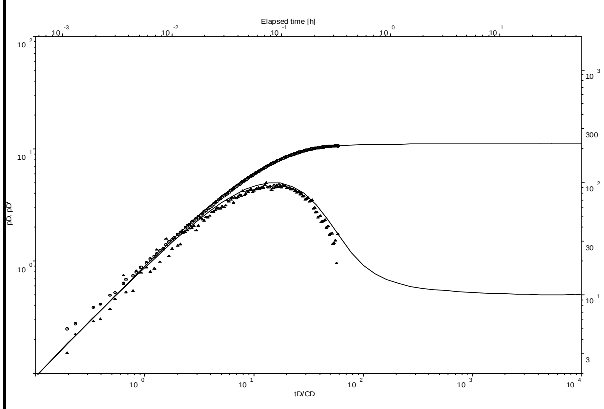


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4844		
p_i (kPa) =	4863		
p_p(kPa) =	5073	p_F (kPa) =	4861
Q_p (m^3/s)=	2.00E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	NA		
Derivative fact.=	0.14	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	9.3E-10		
T_M (m^2/s)=	7.7E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.10	dt_1 (min) =	NA
dt_2 (min) =	12.77	dt_2 (min) =	NA
T (m^2/s) =	6.3E-10	T (m^2/s) =	1.7E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.3E-10	K_s (m/s) =	3.4E-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 (-) =	0.9	ξ (-) =	8.0
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) =	NA	C (m^3/Pa) =	2.2E-11
dt_2 (min) =	NA	C_D (-) =	2.4E-03
T_T (m^2/s) =	1.7E-09	ξ (-) =	8.0
S (-) =	1.0E-06		
K_s (m/s) =	3.4E-10		
S_s (1/m) =	2.0E-07		

Comments:

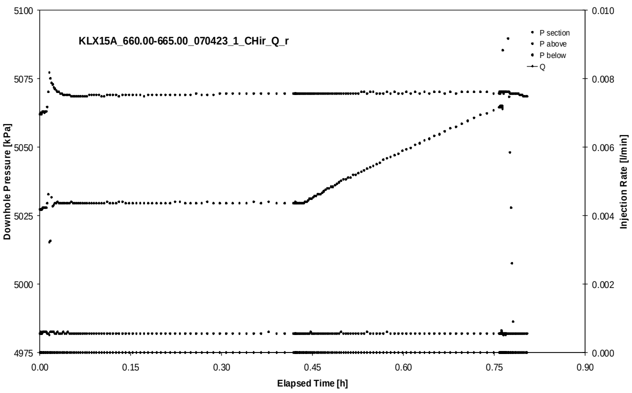
The recommended transmissivity of 1.7E-09 m2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 4.0E-10 m2/s to 3.0E-09 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 4,852.9 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070423 22:41
Test section from - to (m):	660.00-665.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	5027		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

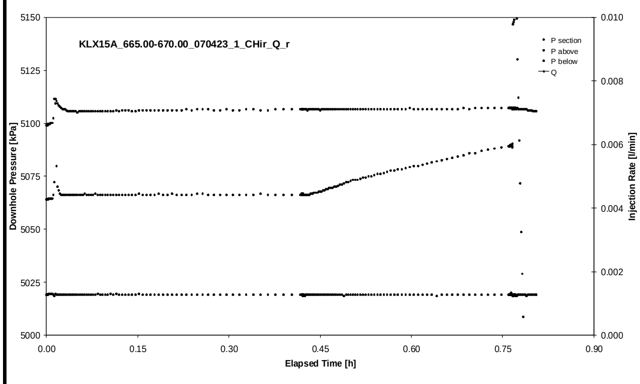
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070423 23:55
Test section from - to (m):	665.00-670.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	5064		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

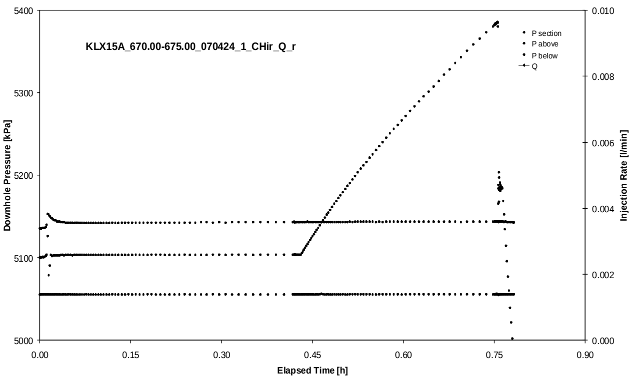
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070424 01:07
Test section from - to (m):	670.00-675.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	5100		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

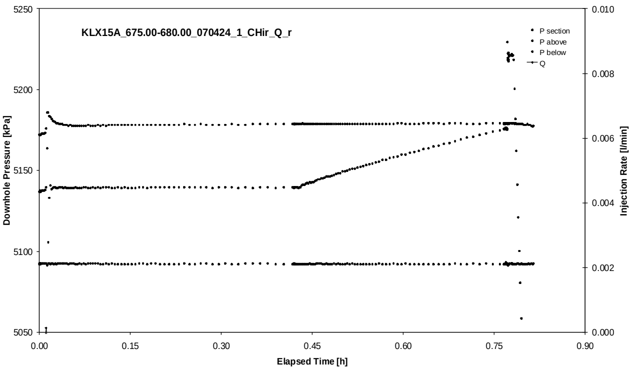
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070424 06:35
Test section from - to (m):	675.00-680.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	5137		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

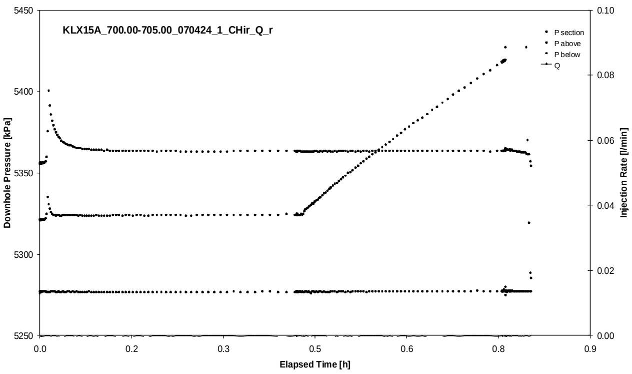
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070424 08:09
Test section from - to (m):	700.00-705.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	5321		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

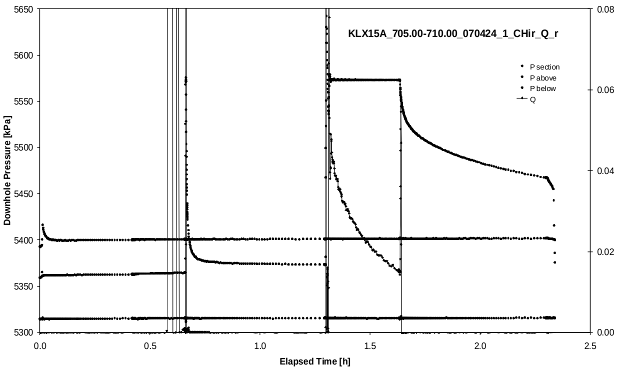
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

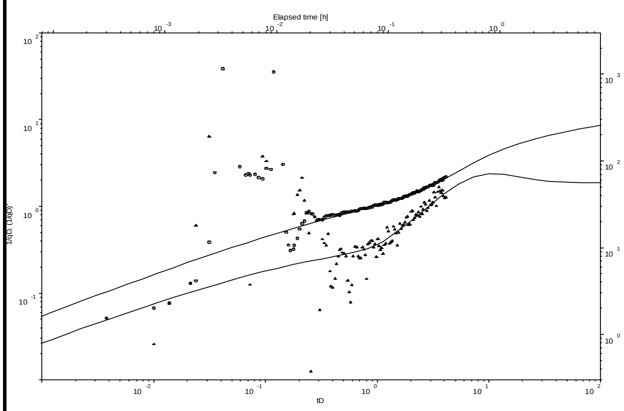
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070424 09:27
Test section from - to (m):	705.00-710.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

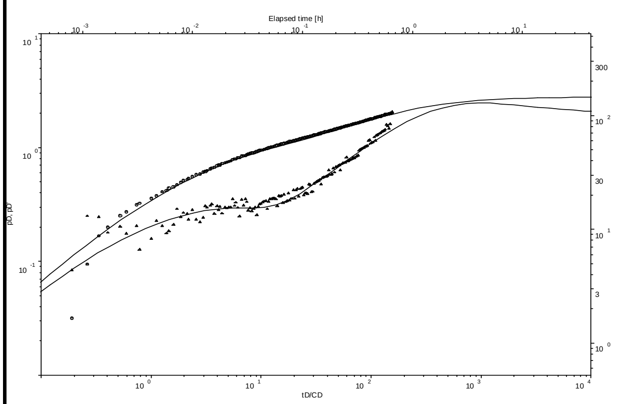


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5360		
p_i (kPa) =	5373		
p_p(kPa) =	5572	p_F (kPa) =	5465
Q_p (m^3/s)=	2.50E-07		
tp (s) =	1200	t_F (s) =	2400
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	NA		
Derivative fact.=	0.04	Derivative fact.=	0.04
Results		**Results**	
Q/s (m^2/s)=	1.2E-08		
T_M (m^2/s)=	1.0E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	0.75
dt_2 (min) =	NA	dt_2 (min) =	2.93
T (m^2/s) =	4.4E-09	T (m^2/s) =	1.4E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	8.8E-10	K_s (m/s) =	2.8E-09
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.4E-10
C_D (-) =	NA	C_D (-) =	1.5E-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

Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	0.75	C (m^3/Pa) =	1.4E-10
dt_2 (min) =	2.93	C_D (-) =	1.5E-02
T_T (m^2/s) =	1.4E-08	ξ (-) =	-3.1
S (-) =	1.0E-06		
K_s (m/s) =	2.8E-09		
S_s (1/m) =	2.0E-07		

Comments:

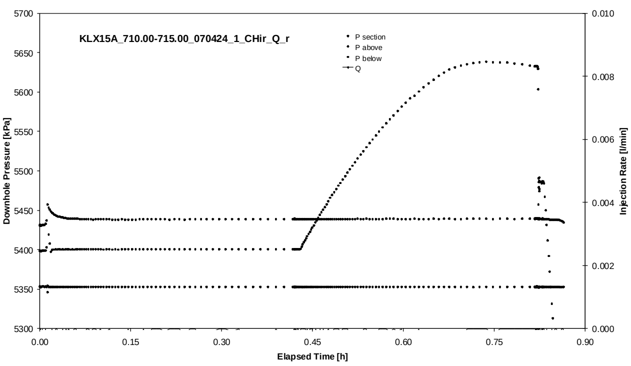
The recommended transmissivity of 1.4E-08 m2/s was derived from the analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 4.0E-09 m2/s to 3.0E-08 m2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the low transmissivity.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070424 12:23
Test section from - to (m):	710.00-715.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	5399		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

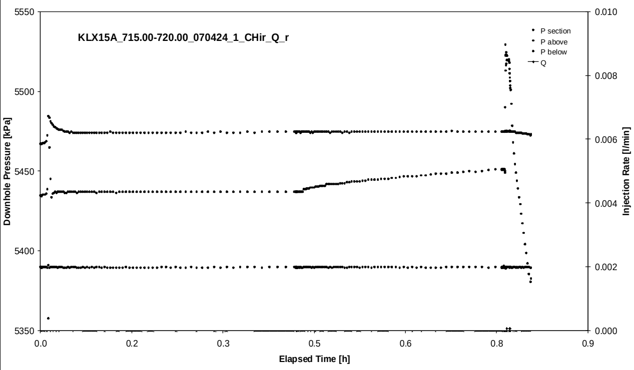
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070424 13:42
Test section from - to (m):	715.00-720.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	5435		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

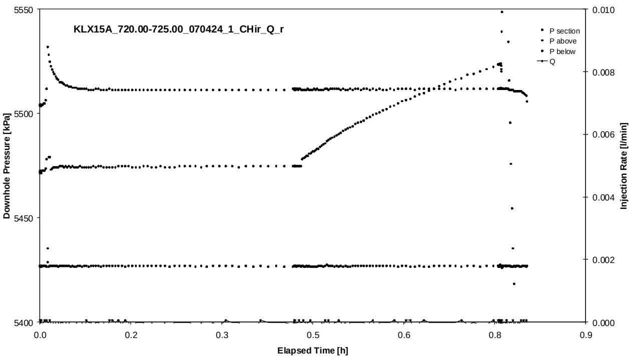
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070424 15:00
Test section from - to (m):	720.00-725.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	5473		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

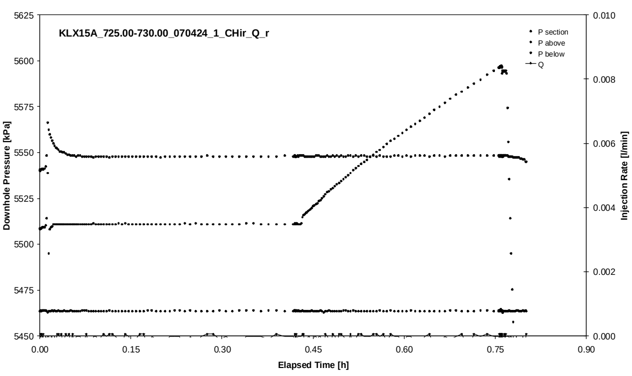
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070424 16:16
Test section from - to (m):	725.00-730.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	5508		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

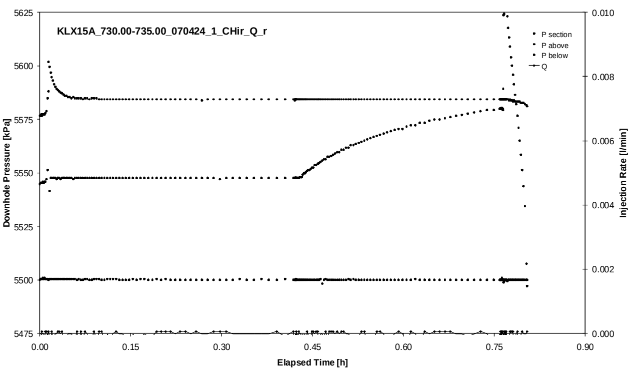
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070424 17:29
Test section from - to (m):	730.00-735.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	5545		
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)=	NA		
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) =	1.00E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

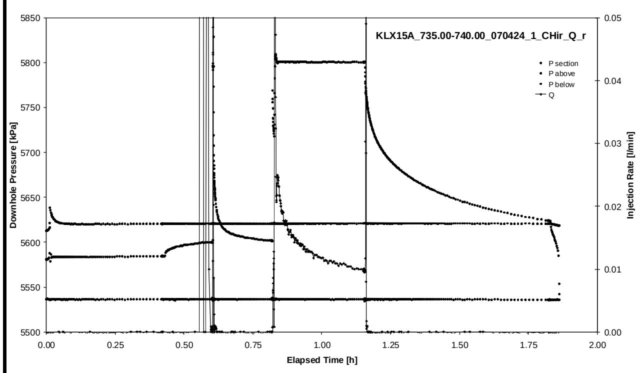
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

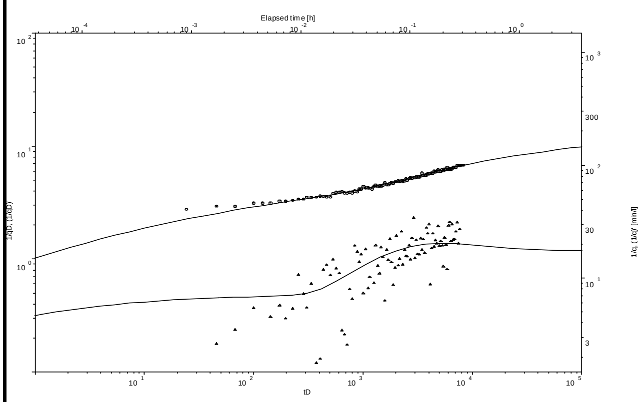
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070424 18:46
Test section from - to (m):	735.00-740.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

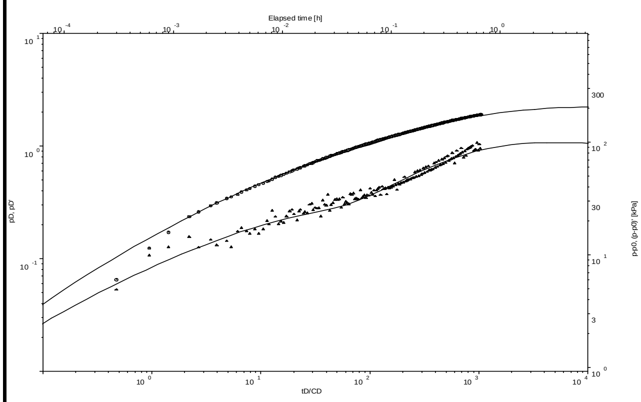
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5580		
p_i (kPa) =	5601		
p_p(kPa) =	5800	p_F (kPa) =	5624
Q_p (m^3/s)=	1.65E-07		
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)=	NA		
Derivative fact.=	0.07	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	8.1E-09		
T_M (m^2/s)=	6.7E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	0.69
dt_2 (min) =	NA	dt_2 (min) =	2.30
T (m^2/s) =	8.9E-09	T (m^2/s) =	3.6E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.8E-09	K_s (m/s) =	7.1E-10
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.2E-12
C_D (-) =	NA	C_D (-) =	5.8E-04
ξ (-) =	0.1	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

Selected representative parameters.			
dt_1 (min) =	0.69	C (m^3/Pa) =	5.2E-12
dt_2 (min) =	2.30	C_D (-) =	5.8E-04
T_T (m^2/s) =	3.6E-09	ξ (-) =	-2.6
S (-) =	1.0E-06		
K_s (m/s) =	7.1E-10		
S_s (1/m) =	2.0E-07		

Comments:

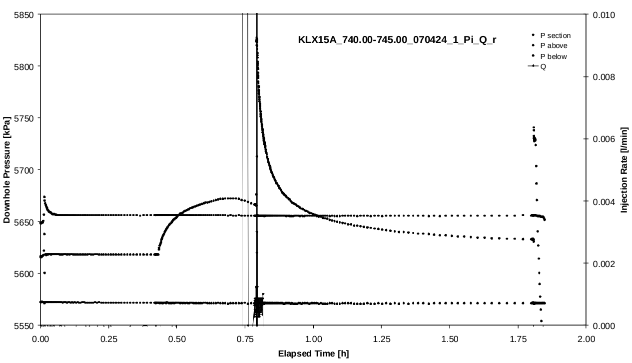
The recommended transmissivity of 3.6E-09 m2/s was derived from the analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-09 m2/s to 1.0E-08 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 5,585.8 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070424 21:17
Test section from - to (m):	740.00-745.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

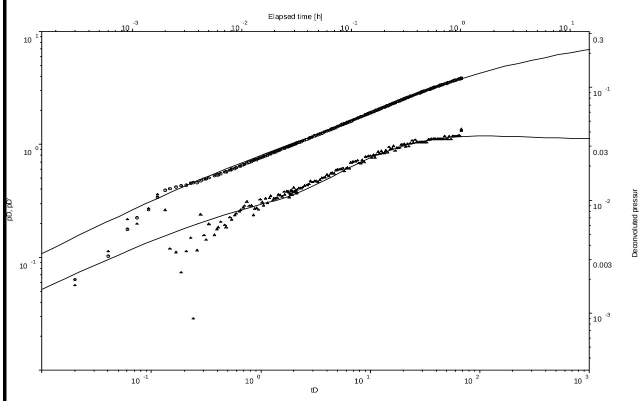


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5616		
p_i (kPa) =	5618		
p_p(kPa) =	5827	p_F (kPa) =	5633
Q_p (m^3/s)=	NA		
tp (s) =	10.2	t_F (s) =	3720
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	NA		
Derivative fact.=	NA	Derivative fact.=	0.02
Results		**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) =	1.8E-10
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	3.5E-11
S_s (1/m) =	NA	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.3E-11
C_D (-) =	NA	C_D (-) =	1.4E-03
ξ (-) =	NA	ξ (-) =	-0.9
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

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	NA	C (m^3/Pa) =	1.3E-11
dt_2 (min) =	NA	C_D (-) =	1.4E-03
T_T (m^2/s) =	1.8E-10	ξ (-) =	-0.9
S (-) =	1.0E-06		
K_s (m/s) =	3.5E-11		
S_s (1/m) =	2.0E-07		

Comments:

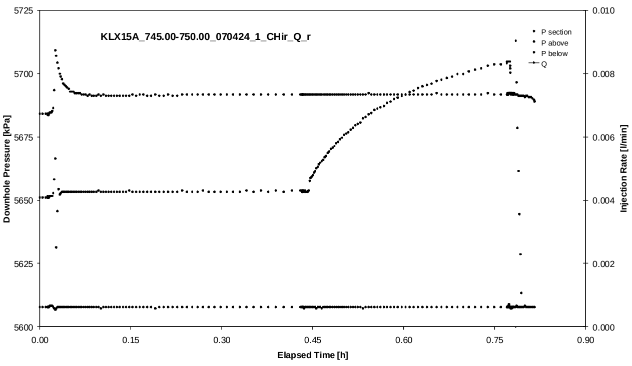
The recommended transmissivity of 1.8E-10 m2/s was derived from the analysis of the Pi phase (inner zone). The confidence range for the interval transmissivity is estimated to be 6.0E-11 to 3.0E-10 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure could not be extrapolated due to the very low transmissivity.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070424 23:35
Test section from - to (m):	745.00-750.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	5651		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

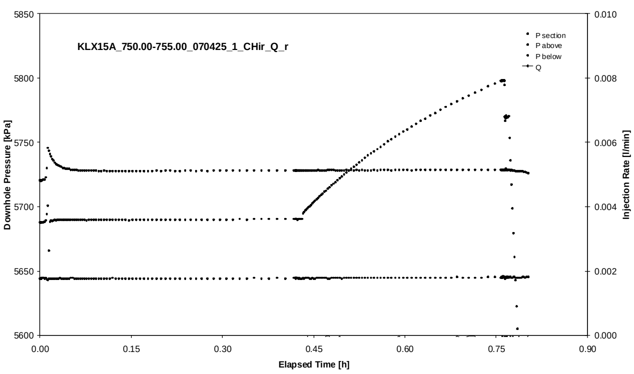
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070425 00:48
Test section from - to (m):	750.00-755.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	5688		
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)=	NA		
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) =	1.00E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

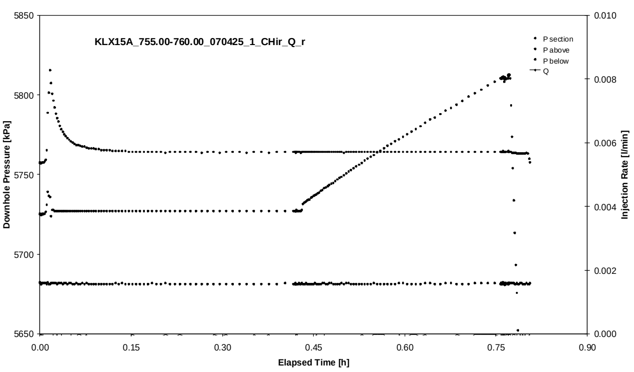
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070425 06:31
Test section from - to (m):	755.00-760.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	5726		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

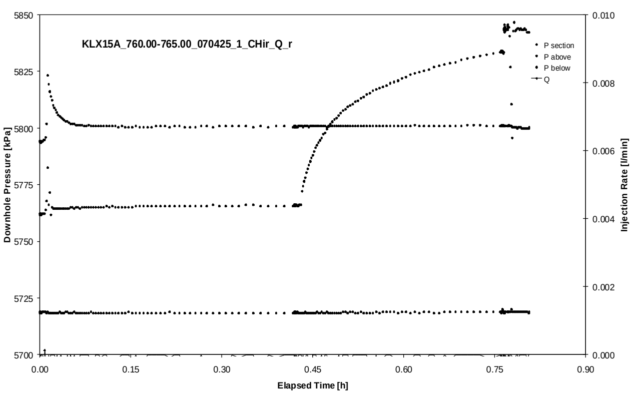
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070425 07:45
Test section from - to (m):	760.00-765.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	5762		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

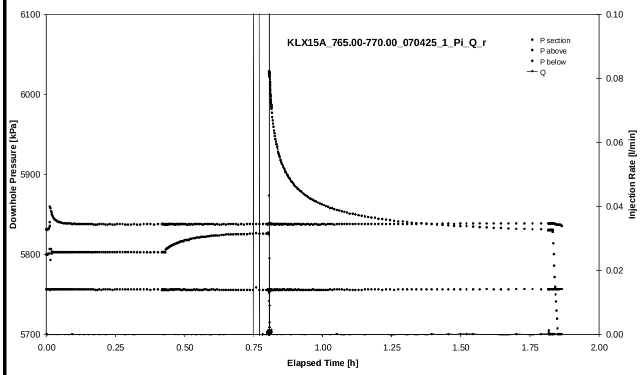
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070425 09:00
Test section from - to (m):	765.00-770.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

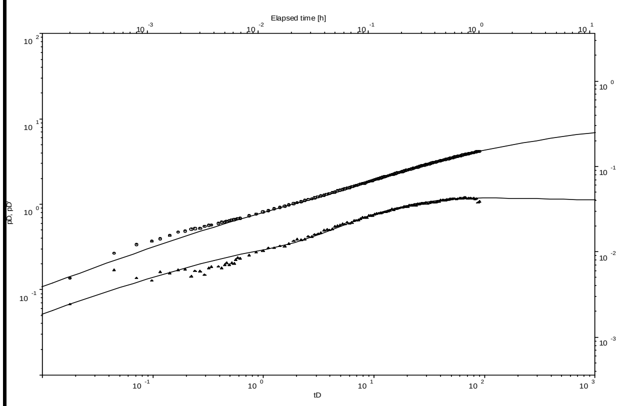


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5800		
p_i (kPa) =	5825		
p_p(kPa) =	6027	p_F (kPa) =	5831
Q_p (m^3/s)=	NA		
tp (s) =	9.0	t_F (s) =	3600
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	NA		
Derivative fact.=	NA	Derivative fact.=	0.10
Results		**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) =	2.5E-10
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	4.9E-11
S_s (1/m) =	NA	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.1E-11
C_D (-) =	NA	C_D (-) =	2.3E-03
ξ (-) =	NA	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

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) =	2.1E-11
dt_2 (min) =	NA	C_D (-) =	2.3E-03
T_T (m^2/s) =	2.5E-10	ξ (-) =	-1.0
S (-) =	1.0E-06		
K_s (m/s) =	4.9E-11		
S_s (1/m) =	2.0E-07		

Comments:

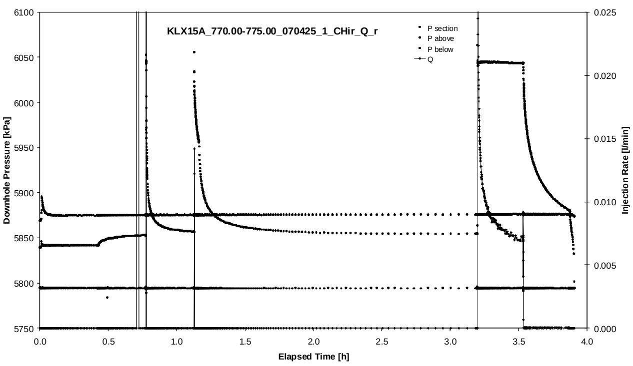
The recommended transmissivity of 2.5E-10 m2/s was derived from the analysis of the Pi phase (inner zone). The confidence range for the interval transmissivity is estimated to be 8.0E-11 to 5.0E-10 m2/s. The analysis was conducted using a flow dimension of 2. The static pressure could not be extrapolated due to the very low transmissivity.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

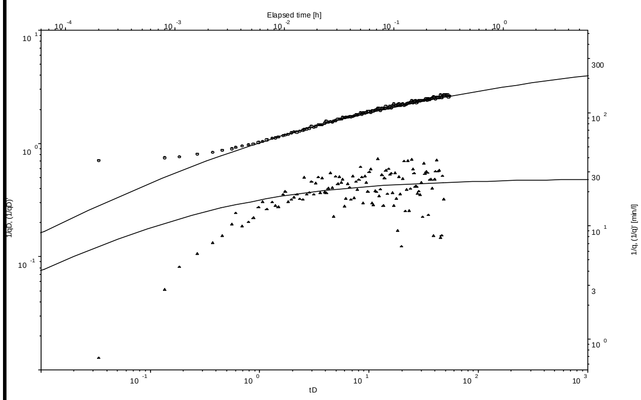
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070425 13:20
Test section from - to (m):	7700.00-775.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

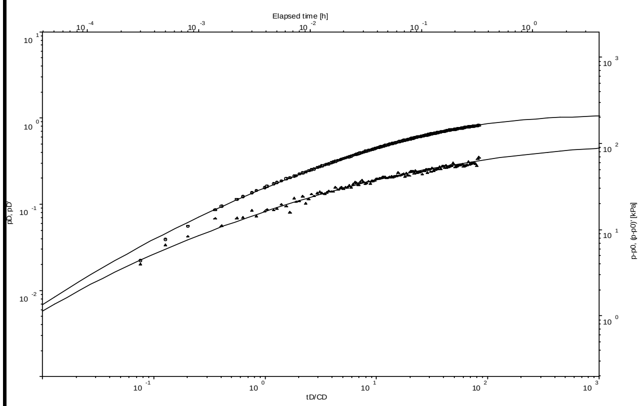


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5840		
p_i (kPa) =	5854		
p_p(kPa) =	6044	p_F (kPa) =	5879
Q_p (m^3/s)=	1.15E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	NA		
Derivative fact.=	0.06	Derivative fact.=	0.04
Results		**Results**	
Q/s (m^2/s)=	5.9E-09		
T_M (m^2/s)=	4.9E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.48	dt_1 (min) =	3.41
dt_2 (min) =	15.01	dt_2 (min) =	17.00
T (m^2/s) =	2.6E-09	T (m^2/s) =	1.2E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.1E-10	K_s (m/s) =	2.3E-10
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.1E-11
C_D (-) =	NA	C_D (-) =	1.2E-03
ξ (-) =	-1.8	ξ (-) =	-3.0
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) =	1.48	C (m^3/Pa) =	1.1E-11
dt_2 (min) =	15.01	C_D (-) =	1.2E-03
T_T (m^2/s) =	2.6E-09	ξ (-) =	-1.8
S (-) =	1.0E-06		
K_s (m/s) =	5.1E-10		
S_s (1/m) =	2.0E-07		

Comments:

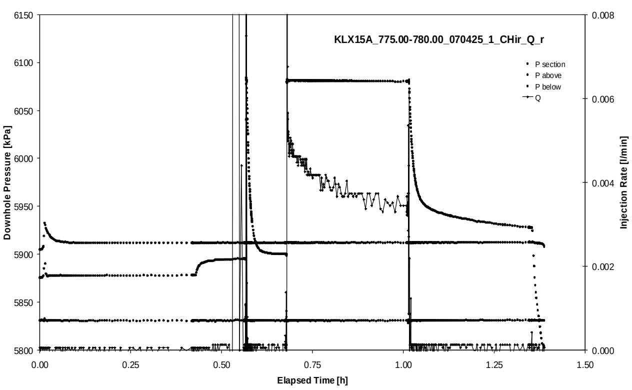
The recommended transmissivity of 2.6E-09 m2/s was derived from the analysis of the CHi phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7.0E-10 m2/s to 6.0E-09 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 5,843.5 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

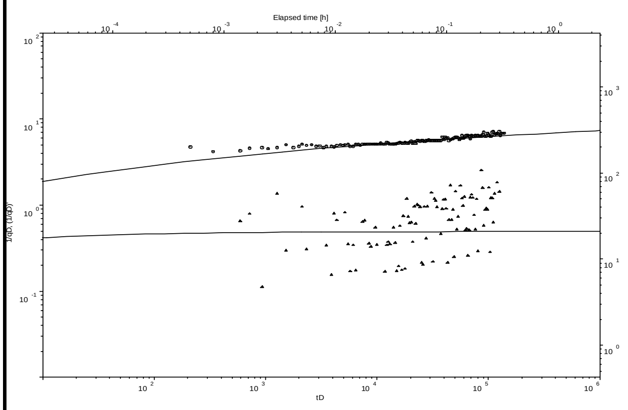
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070425 17:38
Test section from - to (m):	775.00-780.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

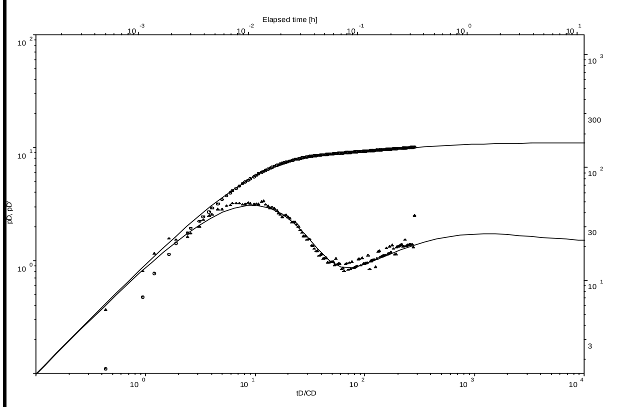


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5876		
p_i (kPa) =	5900		
p_p(kPa) =	6080	p_F (kPa) =	5927
Q_p (m^3/s)=	5.67E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	NA		
Derivative fact.=	0.09	Derivative fact.=	0.07
Results		**Results**	
Q/s (m^2/s)=	3.1E-09		
T_M (m^2/s)=	2.5E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	2.00	dt_1 (min) =	3.68
dt_2 (min) =	13.61	dt_2 (min) =	7.19
T (m^2/s) =	3.4E-09	T (m^2/s) =	6.8E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	6.8E-10	K_s (m/s) =	1.4E-09
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.8E-11
C_D (-) =	NA	C_D (-) =	2.0E-03
ξ (-) =	2.0	ξ (-) =	5.4
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) =	3.68	C (m^3/Pa) =	1.8E-11
dt_2 (min) =	7.19	C_D (-) =	2.0E-03
T_T (m^2/s) =	6.8E-09	ξ (-) =	5.4
S (-) =	1.0E-06		
K_s (m/s) =	1.4E-09		
S_s (1/m) =	2.0E-07		

Comments:

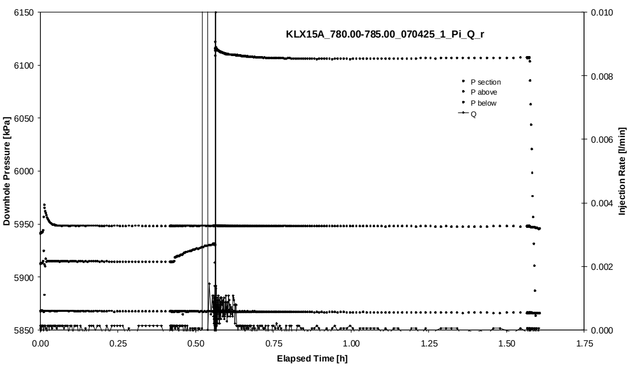
The recommended transmissivity of 6.8E-09 m2/s was derived from the analysis of the CHir phase (inner zone), which shows the best horizontal stabilisation and derivative quality. The confidence range for the interval transmissivity is estimated to be 2.0E-09 m2/s to 9.0E-09 m2/s. The flow dimension displayed during the test is 2. 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 5,909.7 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070425 19:31
Test section from - to (m):	780.00-785.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	5913		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

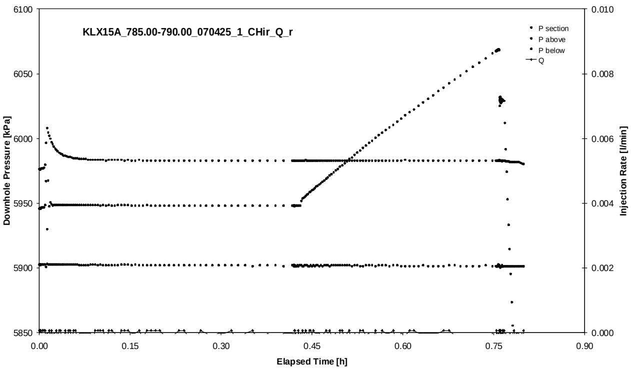
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070425 21:31
Test section from - to (m):	785.00-790.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	5945		
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)=	NA		
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) =	1.0E-11	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 (-) =	
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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

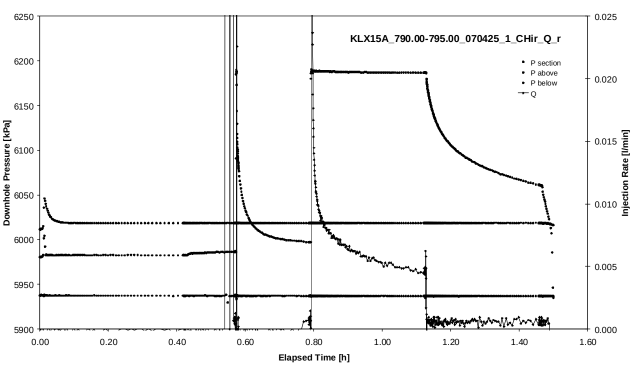
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

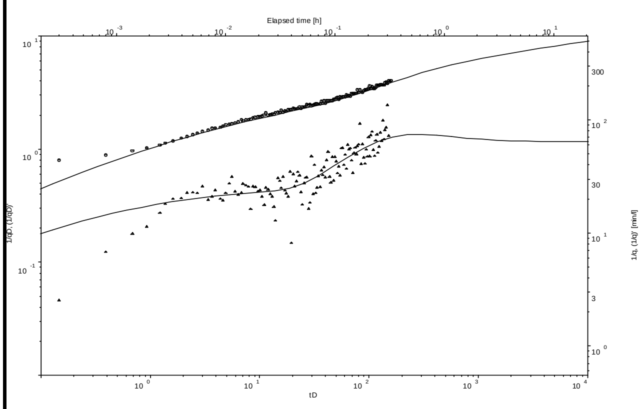
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070425 22:42
Test section from - to (m):	790.00-795.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

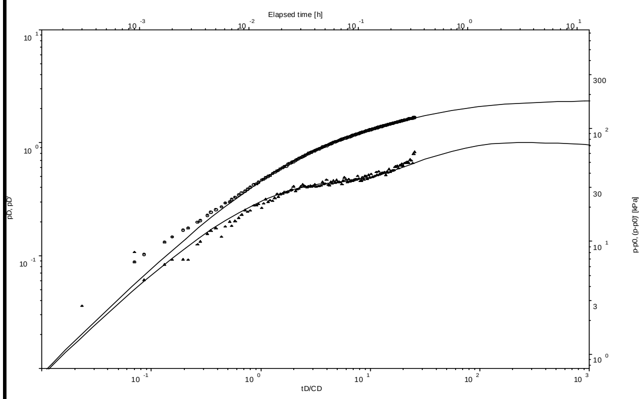


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5980		
p_i (kPa) =	5997		
p_p(kPa) =	6187	p_F (kPa) =	6058
Q_p (m^3/s)=	7.33E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	NA		
Derivative fact.=	0.08	Derivative fact.=	0.06
Results		**Results**	
Q/s (m^2/s)=	3.8E-09		
T_M (m^2/s)=	3.1E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.62	dt_1 (min) =	1.56
dt_2 (min) =	2.42	dt_2 (min) =	5.45
T (m^2/s) =	2.5E-09	T (m^2/s) =	2.2E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.0E-10	K_s (m/s) =	4.4E-10
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.5E-11
C_D (-) =	NA	C_D (-) =	7.2E-03
ξ (-) =	-1.3	ξ (-) =	-2.1
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



Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	1.56	C (m^3/Pa) =	6.5E-11
dt_2 (min) =	5.45	C_D (-) =	7.2E-03
T_T (m^2/s) =	2.2E-09	ξ (-) =	-2.1
S (-) =	1.0E-06		
K_s (m/s) =	4.4E-10		
S_s (1/m) =	2.0E-07		

Comments:

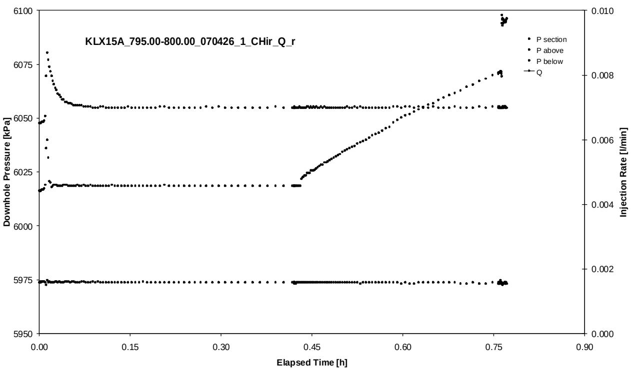
The recommended transmissivity of 2.2E-09 m2/s was derived from the analysis of the CHir phase (inner zone), which shows the best derivative quality. The confidence range for the interval transmissivity is estimated to be 5.0E-10 m2/s to 5.0E-09 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6,009.0 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070426 00:40
Test section from - to (m):	795.00-800.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	6016		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

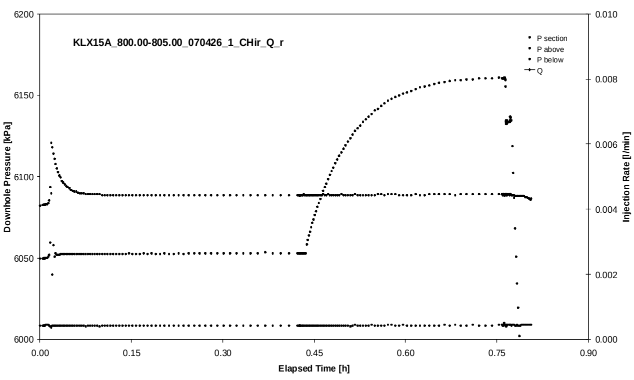
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070426 06:31
Test section from - to (m):	800.00-805.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	6050		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

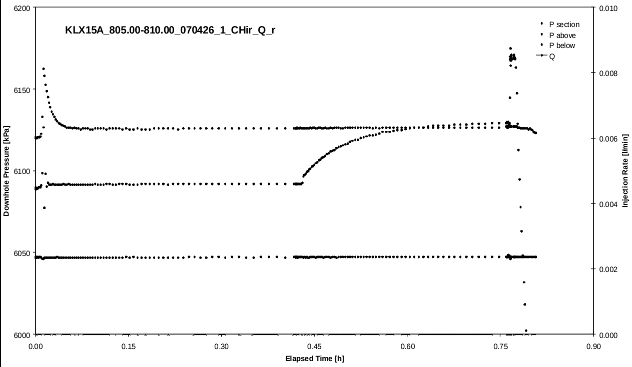
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070426 12:24
Test section from - to (m):	805.00-810.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	6089		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

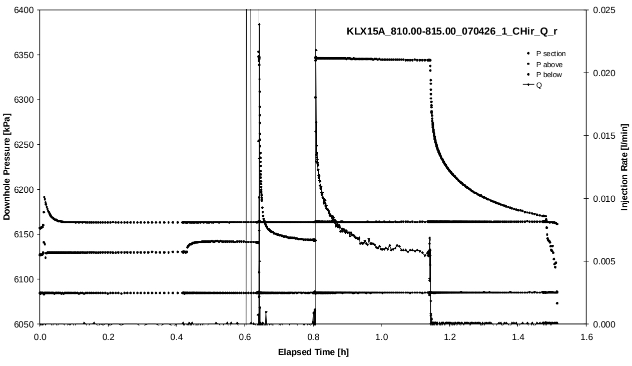
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

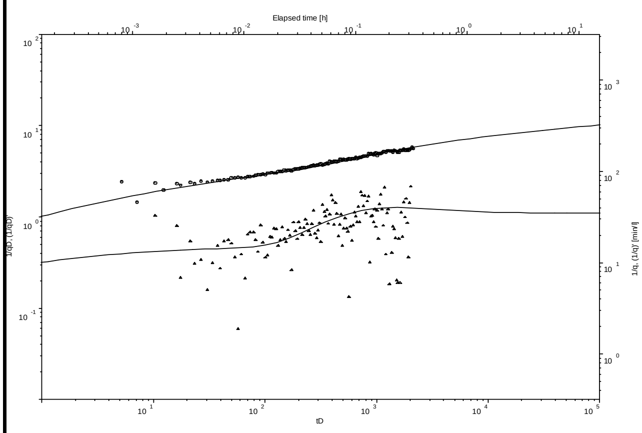
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070426 13:40
Test section from - to (m):	810.00-815.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

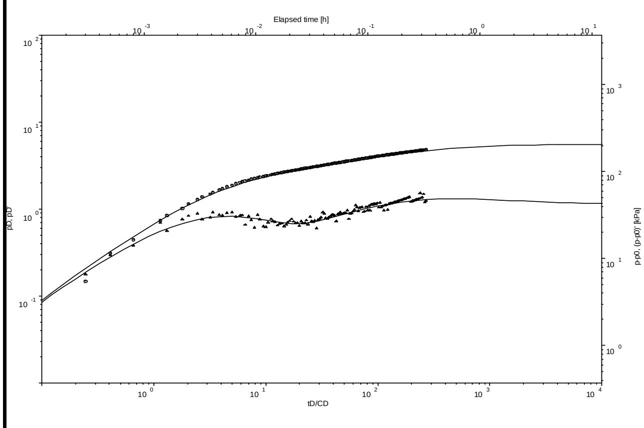


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	6127		
p_i (kPa) =	6143		
p_p(kPa) =	6343	p_F (kPa) =	6170
Q_p (m^3/s)=	8.33E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	NA		
Derivative fact.=	0.06	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	4.1E-09		
T_M (m^2/s)=	3.4E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.29	dt_1 (min) =	0.83
dt_2 (min) =	1.00	dt_2 (min) =	2.03
T (m^2/s) =	4.1E-09	T (m^2/s) =	4.9E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	8.2E-10	K_s (m/s) =	9.8E-10
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.4E-11
C_D (-) =	NA	C_D (-) =	1.5E-03
ξ (-) =	-0.2	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

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) =	1.4E-11
dt_2 (min) =	2.03	C_D (-) =	1.5E-03
T_T (m^2/s) =	4.9E-09	ξ (-) =	-0.2
S (-) =	1.0E-06		
K_s (m/s) =	9.8E-10		
S_s (1/m) =	2.0E-07		

Comments:

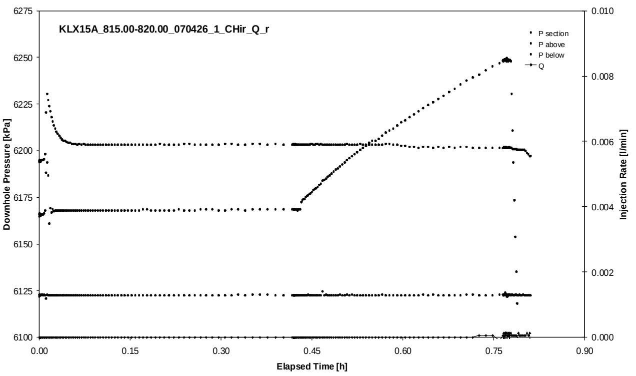
The recommended transmissivity of 4.9E-09 m2/s was derived from the analysis of the CHir phase (inner zone), which shows the best horizontal stabilisation and derivative quality. The confidence range for the interval transmissivity is estimated to be 1.0E-09 m2/s to 8.0E-09 m2/s. The flow dimension displayed during the test is 2. The static pressure measured at transducer depth, was derived from the CHir phase using type curve extrapolation in the Horner plot to a value of 6,137.8 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070426 15:35
Test section from - to (m):	815.00-820.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	6164		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

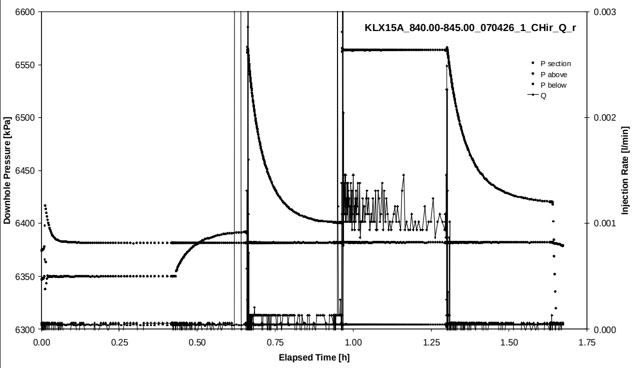
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

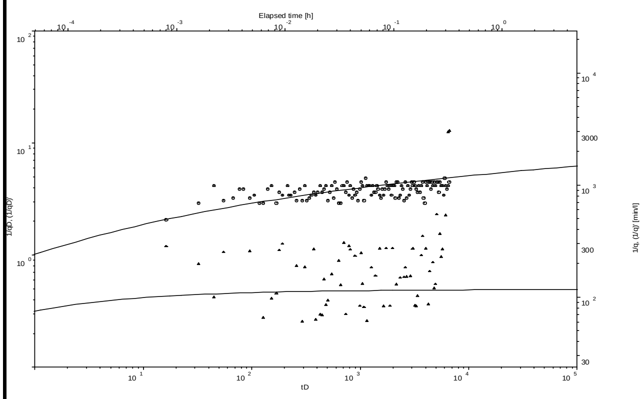
Project:	Oskarshamn site investigation	Test type:[1]	Chir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070426 17:00
Test section from - to (m):	840.00-845.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

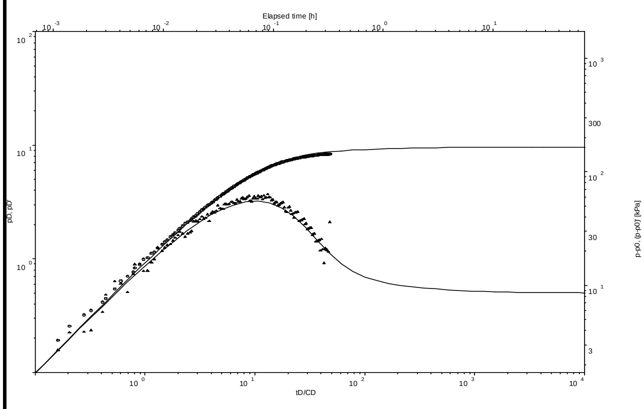


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6347		
p_i (kPa) =	6400		
p_p(kPa) =	6564	p_F (kPa) =	6419
Q_p (m^3/s)=	1.67E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	NA		
Derivative fact.=	0.2	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	1.0E-09		
T_M (m^2/s)=	8.2E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.19	dt_1 (min) =	NA
dt_2 (min) =	15.17	dt_2 (min) =	NA
T (m^2/s) =	6.7E-10	T (m^2/s) =	1.7E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.3E-10	K_s (m/s) =	3.3E-10
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.6E-11
C_D (-) =	NA	C_D (-) =	2.9E-03
ξ (-) =	1.3	ξ (-) =	5.2
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

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) =	2.6E-11
dt_2 (min) =	NA	C_D (-) =	2.9E-03
T_T (m^2/s) =	1.7E-09	ξ (-) =	5.2
S (-) =	1.0E-06		
K_s (m/s) =	3.3E-10		
S_s (1/m) =	2.0E-07		

Comments:

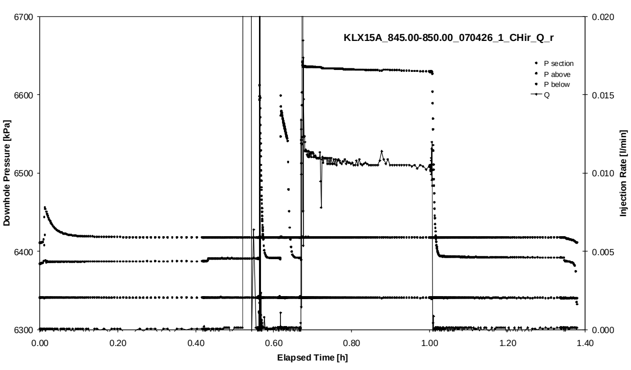
The recommended transmissivity of 1.7E-09 m2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 4.0E-10 m2/s to 5.0E-09 m2/s. For the analysis of both tests a flow dimension of 2 was assumed. 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 6,411.2 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

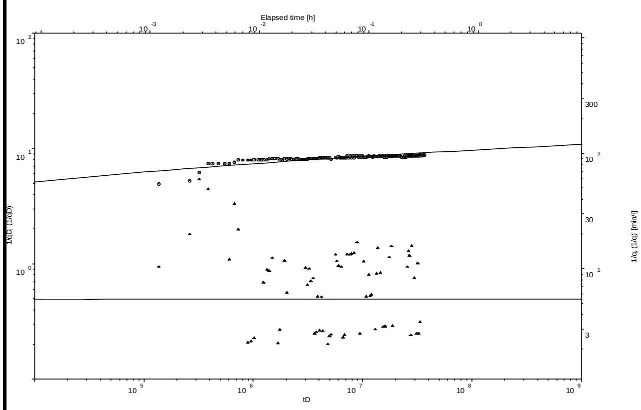
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070426 19:05
Test section from - to (m):	845.00-850.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

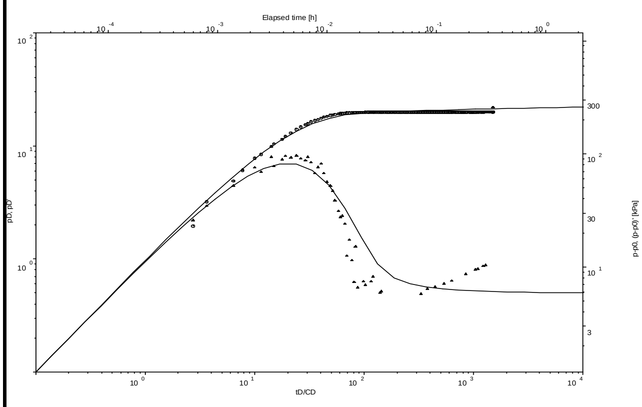


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6385		
p_i (kPa) =	6391		
p_p(kPa) =	6630	p_F (kPa) =	6392
Q_p (m^3/s)=	1.67E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	NA		
Derivative fact.=	0.04	Derivative fact.=	0.01
Results		**Results**	
Q/s (m^2/s)=	6.8E-09		
T_M (m^2/s)=	5.6E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.89	dt_1 (min) =	NA
dt_2 (min) =	15.14	dt_2 (min) =	NA
T (m^2/s) =	9.9E-09	T (m^2/s) =	2.4E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.0E-09	K_s (m/s) =	4.9E-09
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.2E-11
C_D (-) =	NA	C_D (-) =	1.4E-03
ξ (-) =	4.2	ξ (-) =	16.0
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) =	NA	C (m^3/Pa) =	1.2E-11
dt_2 (min) =	NA	C_D (-) =	1.4E-03
T_T (m^2/s) =	2.4E-08	ξ (-) =	16.0
S (-) =	1.0E-06		
K_s (m/s) =	4.9E-09		
S_s (1/m) =	2.0E-07		

Comments:

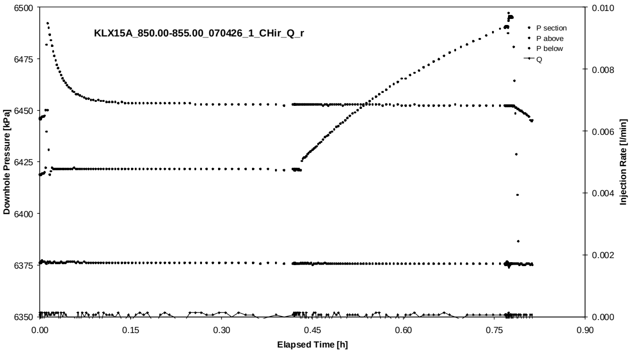
The recommended transmissivity of 2.4E-08 m2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 6.0E-09 m2/s to 7.0E-08 m2/s. The flow dimension displayed during the test is 2. 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 6,391.7 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070426 21:12
Test section from - to (m):	850.00-855.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	6418		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

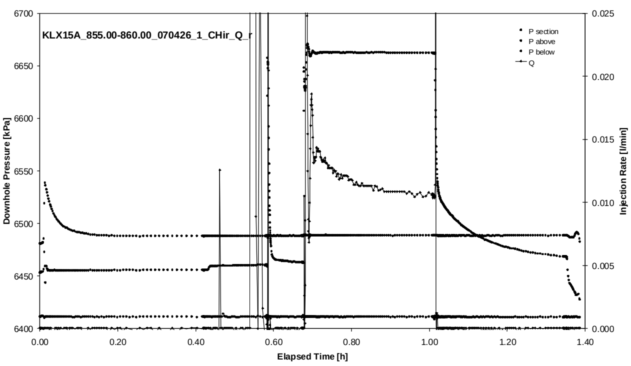
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

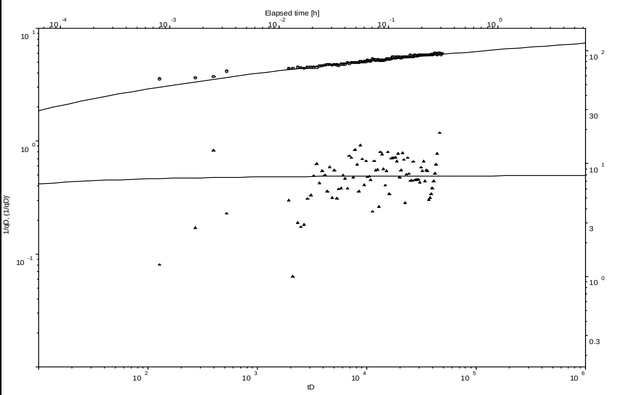
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070426 22:24
Test section from - to (m):	855.00-860.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

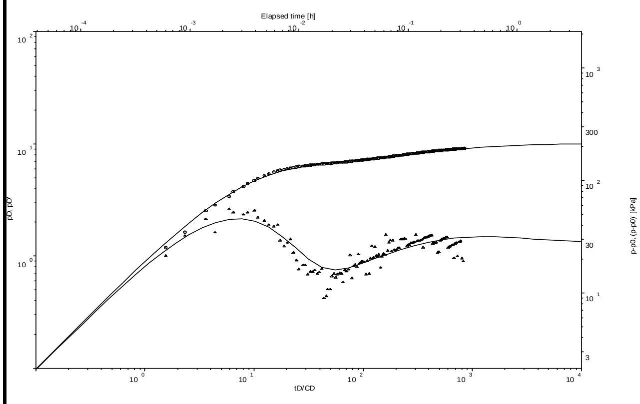
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	6454		
p_i (kPa) =	6462		
p_p(kPa) =	6662	p_F (kPa) =	6468
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)=	NA		
Derivative fact.=	0.10	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	8.2E-09		
T_M (m^2/s)=	6.7E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.43	dt_1 (min) =	0.75
dt_2 (min) =	15.23	dt_2 (min) =	2.14
T (m^2/s) =	8.2E-09	T (m^2/s) =	1.4E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.6E-09	K_s (m/s) =	2.9E-09
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.3E-11
C_D (-) =	NA	C_D (-) =	1.4E-03
ξ (-) =	1.0	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) =	0.75	C (m^3/Pa) =	1.3E-11
dt_2 (min) =	2.14	C_D (-) =	1.4E-03
T_T (m^2/s) =	1.4E-08	ξ (-) =	3.3
S (-) =	1.0E-06		
K_s (m/s) =	2.9E-09		
S_s (1/m) =	2.0E-07		

Comments:

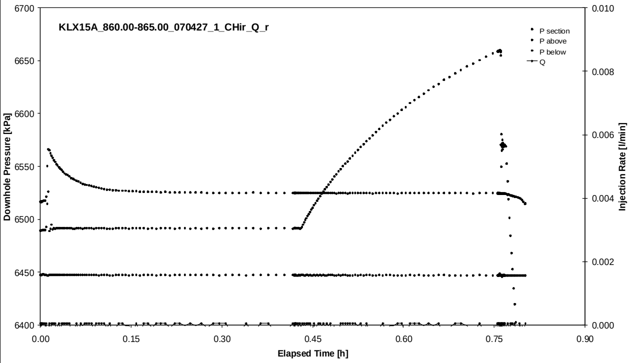
The recommended transmissivity of 1.4E-08 m2/s was derived from the analysis of the CHir phase (inner zone), which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 4.0E-09 m2/s to 3.0E-08 m2/s. The flow dimension displayed during the test is 2. 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 6,447.4 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070427 00:09
Test section from - to (m):	860.00-865.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	6489		
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)=	NA		
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) =	1.00E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

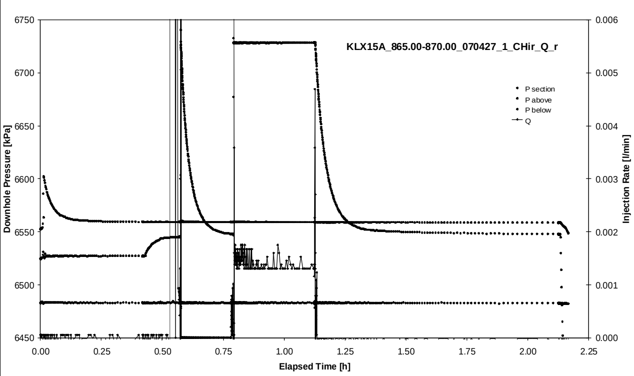
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

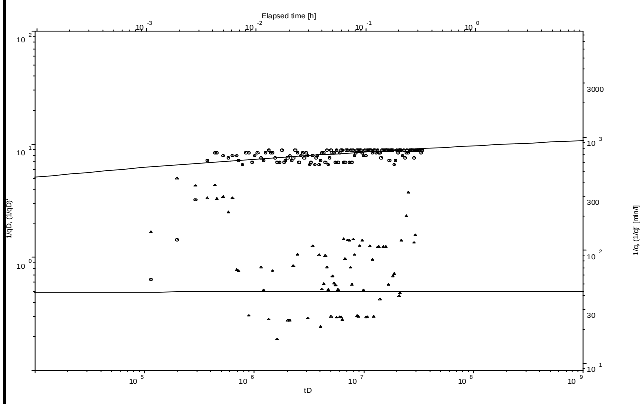
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070427 01:20
Test section from - to (m):	865.00-870.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

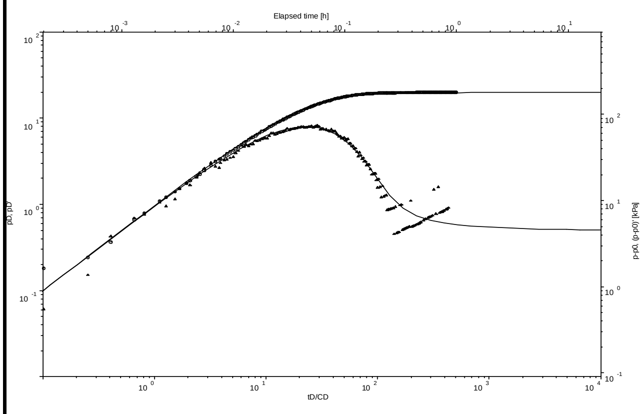


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	6526		
p_i (kPa) =	6547		
p_p(kPa) =	6728	p_F (kPa) =	6548
Q_p (m^3/s)=	2.17E-08		
tp (s) =	1200	t_F (s) =	3600
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	NA		
Derivative fact.=	0.30	Derivative fact.=	0.04
Results		**Results**	
Q/s (m^2/s)=	1.2E-09		
T_M (m^2/s)=	9.7E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.55	dt_1 (min) =	NA
dt_2 (min) =	12.14	dt_2 (min) =	NA
T (m^2/s) =	1.7E-09	T (m^2/s) =	4.4E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.3E-10	K_s (m/s) =	8.7E-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 (-) =	2.2E-03
ξ (-) =	5.1	ξ (-) =	15.7
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

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) =	2.0E-11
dt_2 (min) =	NA	C_D (-) =	2.2E-03
T_T (m^2/s) =	4.4E-09	ξ (-) =	15.7
S (-) =	1.0E-06		
K_s (m/s) =	8.7E-10		
S_s (1/m) =	2.0E-07		

Comments:

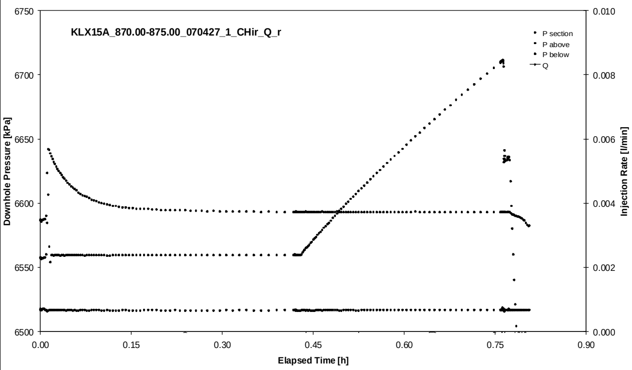
The recommended transmissivity of 4.4E-09 m2/s was derived from the analysis of the CHir phase, which shows the better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 8.0E-10 m2/s to 7.0E-09 m2/s. The flow dimension for the analysis was assumed to be 2. 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 6,546.8 kPa.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070427 06:28
Test section from - to (m):	870.00-875.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	6557		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

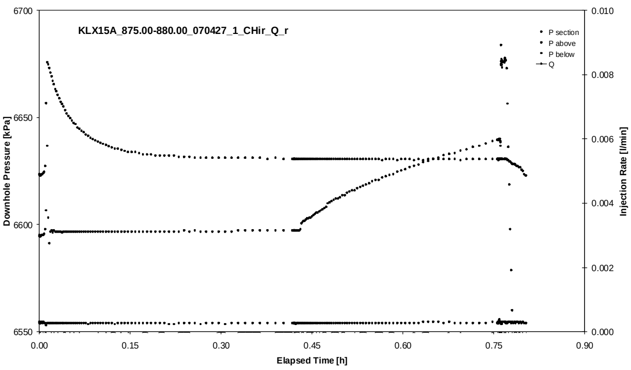
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070427 07:43
Test section from - to (m):	875.00-880.00 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
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) =	6595		
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)=	NA		
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) =	1.0E-11	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) =	1.0E-11	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

Comments:

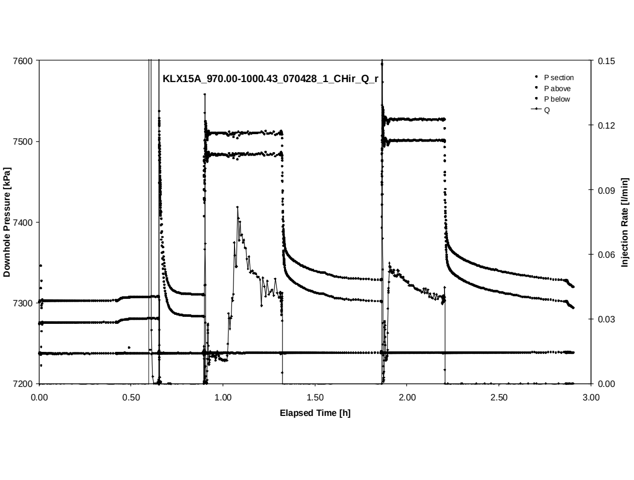
Based on the test response (prolonged packer compliance) the interval transmissivity is lower than 1.0E-11 m2/s.

[1] According to SKB MD 320.004 appendix 3.

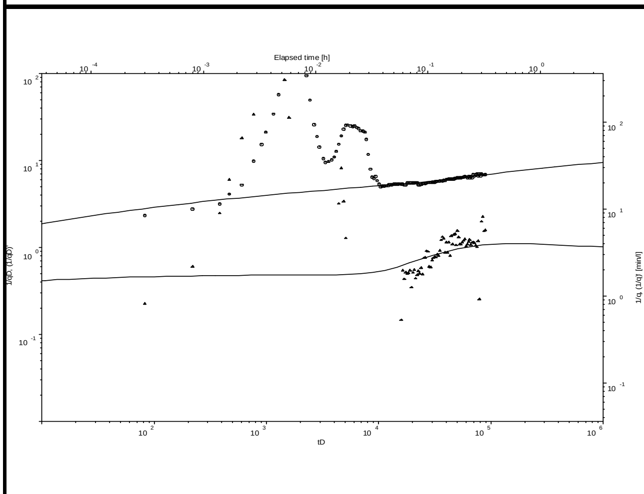
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX15A	Test start:	070428 10:58
Test section from - to (m):	970.00-1000.43 m	Responsible for test execution:	Stephan Rohs Reinder van der Wall
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

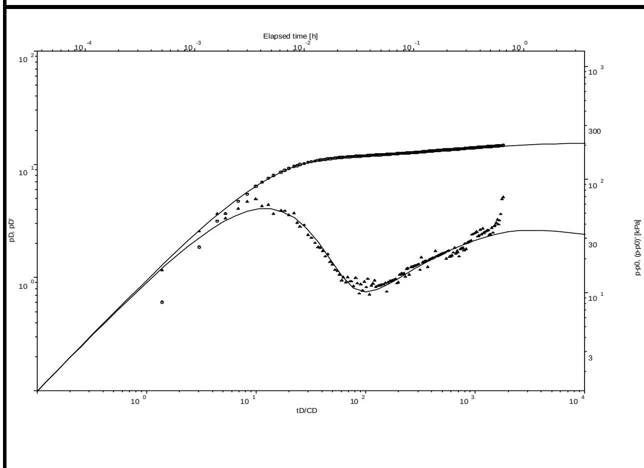
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	7275		
p_i (kPa) =	7301		
p_p(kPa) =	7501	p_F (kPa) =	7301
Q_p (m^3/s)=	6.67E-07		
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)=	NA		
Derivative fact.=	0.20	Derivative fact.=	0.06
Results		**Results**	
Q/s (m^2/s)=	3.3E-08		
T_M (m^2/s)=	3.6E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	1.40
dt_2 (min) =	NA	dt_2 (min) =	3.91
T (m^2/s) =	3.6E-08	T (m^2/s) =	8.3E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.2E-09	K_s (m/s) =	2.7E-09
S_s (1/m) =	3.3E-08	S_s (1/m) =	3.3E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.9E-11
C_D (-) =	NA	C_D (-) =	7.6E-03
ξ (-) =	0.6	ξ (-) =	7.4
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) =	6.9E-11
dt_2 (min) =	3.91	C_D (-) =	7.6E-03
T_T (m^2/s) =	8.3E-08	ξ (-) =	7.4
S (-) =	1.0E-06		
K_s (m/s) =	1.7E-08		
S_s (1/m) =	2.0E-07		

Comments:

The recommended transmissivity of 8.3E-08 m2/s was derived from the 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 4.0E-08 m2/s to 3.0E-07 m2/s. The flow dimension displayed during the test is 2. 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 7,289.6 kPa.

[1] According to SKB MD 320.004 appendix 3.

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·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: $nc_tb= n\cdot c_t.b$	$[(L^2T^2)/M]$	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”)		

APPENDIX 5

SICADA data tables

APPENDIX 5-1

SICADA data tables (Injection tests)

(Simplified version v1.4

SICADA/Data Import Template

File Identity	
Created By	
Created	

Compiled By	
Quality Check For Delivery	
Delivery Approval	

Activity Type	KLX 15A KLX 15A - Injection test

Project	AP PS 400-07-007

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 15A	2007-04-12 07:48	2007-04-28 13:52	80.00	1000.43		Golder Associates	Stephan Rohs, Reinder van der Wall, Philipp Wolf	Linda Höckert, Eric Lövgren, Sascha Lenné, Thomas Cronquist	Reinder van der Wall, Philipp Wolf, Stephan Rohs	Reinder van der Wall, 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_hp	FLOAT	m	Hydraulic head in test section at stop of the flow period.
final_head_hf	FLOAT	m	Hydraulic head in test section at stop of recovery period.
initial_press_pi	FLOAT	kPa	Groundwater pressure in test section at start of flow period
press_at_flow_end_pp	FLOAT	kPa	Groundwater pressure in test section at stop of flow period.
final_press_pf	FLOAT	kPa	Ground water pressure at the end of the recovery period.
fluid_temp_tew	FLOAT	oC	Measured section fluid temperature, see table description
fluid_elcond_ecw	FLOAT	mS/m	Measured section fluid el. conductivity,see table descr.
fluid_salinity_tdsw	FLOAT	mg/l	Total salinity of section fluid based on EC,see table descr.
fluid_salinity_tdswm	FLOAT	mg/l	Tot. section fluid salinity based on water sampling,see...
reference	CHAR		SKB report No for reports describing data and evaluation
comments	VARCHAR		Short comment to data
error_flag	CHAR		If error_flag = "*" then an error occured and an error
in_use	CHAR		If in_use = "*" then the activity has been selected as
sign	CHAR		Signature for QA data accknowledge (QA - OK)
lp	FLOAT	m	Hydraulic point of application

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 15A	2007-04-12 07:48:00	2007-04-12 10:08:00	80.00	180.00		3	1	2007-04-12 09:06:39	2007-04-12 09:36:39	4.42E-04	0	5.20E-04	1.67E-08	8.33E-04	1.50E+00
KLX 15A	2007-04-12 13:56:00	2007-04-12 16:07:00	180.00	280.00		3	1	2007-04-12 15:05:54	2007-04-12 15:35:54	1.28E-04	0	1.42E-04	1.67E-08	8.33E-04	1.50E+00
KLX 15A	2007-04-12 17:54:00	2007-04-12 20:31:00	280.00	380.00		3	1	2007-04-12 18:59:16	2007-04-12 19:29:16	2.83E-07	0	2.92E-07	1.67E-08	8.33E-04	1.50E+00
KLX 15A	2007-04-12 22:07:00	2007-04-12 23:57:00	380.00	480.00		3	1	2007-04-12 22:55:27	2007-04-12 23:55:27	3.20E-05	0	3.37E-05	1.67E-08	8.33E-04	1.50E+00
KLX 15A	2007-04-13 06:20:00	2007-04-13 08:19:00	480.00	580.00		3	1	2007-04-13 07:17:50	2007-04-13 07:47:50	2.28E-06	0	2.32E-06	1.67E-08	8.33E-04	1.50E+00
KLX 15A	2007-04-13 10:28:00	2007-04-13 12:19:00	580.00	680.00		3	1	2007-04-13 11:17:08	2007-04-15 11:47:08	1.36E-05	0	1.57E-05	1.67E-08	8.33E-04	1.50E+00
KLX 15A	2007-04-13 15:02:00	2007-04-13 17:27:00	680.00	780.00		3	1	2007-04-13 16:25:02	2007-04-14 16:55:02	5.17E-07	0	7.33E-07	1.67E-08	8.33E-04	1.50E+00
KLX 15A	2007-04-13 19:23:00	2007-04-13 21:53:00	780.00	880.00		3	1	2007-04-13 20:21:50	2007-04-13 20:51:50	6.50E-07	0	7.50E-07	1.67E-08	8.33E-04	1.50E+00
KLX 15A	2007-04-14 19:23:00	2007-04-14 20:46:00	80.00	100.00		3	1	2007-04-14 20:04:48	2007-04-14 20:24:48	5.32E-05	0	5.57E-05	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-14 22:09:00	2007-04-14 23:32:00	100.00	120.00		3	1	2007-04-14 22:50:23	2007-04-14 23:10:23	4.90E-05	0	5.05E-05	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-15 00:09:00	2007-04-15 01:31:00	120.00	140.00		3	1	2007-04-15 00:49:27	2007-04-15 01:09:27	4.32E-04	0	4.92E-04	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-15 07:52:00	2007-04-15 09:21:00	140.00	160.00		3	1	2007-04-15 08:39:25	2007-04-15 08:59:25	4.47E-05	0	4.65E-05	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-15 10:15:00	2007-04-15 11:42:00	160.00	180.00		3	1	2007-04-15 11:00:23	2007-04-15 11:20:23	1.77E-06	0	1.85E-06	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-15 12:35:00	2007-04-15 14:01:00	180.00	200.00		3	1	2007-04-15 13:19:40	2007-04-15 13:39:40	1.62E-05	0	1.67E-05	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-15 14:59:00	2007-04-15 16:43:00	200.00	220.00		3	1	2007-04-15 16:01:11	2007-04-15 16:21:11	5.00E-08	0	5.17E-08	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-15 17:16:00	2007-04-15 19:09:00	220.00	240.00		3	1	2007-04-15 18:27:51	2007-04-15 18:47:51	8.33E-08	0	9.20E-08	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-15 19:47:00	2007-04-15 22:15:00	240.00	260.00		3	1	2007-04-15 20:53:24	2007-04-15 21:13:24	3.33E-08	0	3.77E-08	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-15 22:53:00	2007-04-16 00:21:00	260.00	280.00		3	1	2007-04-15 23:39:11	2007-04-15 23:59:11	1.60E-04	0	1.72E-04	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-16 00:56:00	2007-04-16 04:49:00	280.00	300.00		3	1	2007-04-16 02:27:26	2007-04-16 02:47:26	2.05E-08	0	3.60E-08	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-16 06:46:00	2007-04-16 07:39:00	300.00	320.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-16 11:08:00	2007-04-16 11:57:00	340.00	360.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-16 13:33:00	2007-04-16 15:03:00	360.00	380.00		3	1	2007-04-16 14:16:59	2007-04-16 14:36:59	3.17E-07	0	3.32E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-16 15:49:00	2007-04-16 17:16:00	380.00	400.00		3	1	2007-04-16 16:34:56	2007-04-16 16:54:56	2.47E-05	0	2.60E-05	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-16 17:49:00	2007-04-16 19:13:00	400.00	420.00		3	1	2007-04-16 18:31:51	2007-04-16 18:51:51	1.43E-05	0	1.49E-05	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-16 19:51:00	2007-04-16 20:47:00	420.00	440.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-16 22:04:00	2007-04-16 23:37:00	440.00	460.00		3	1	2007-04-16 22:55:49	2007-04-16 23:15:49	4.00E-07	0	4.67E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-17 00:11:00	2007-04-17 05:32:00	460.00	480.00		3	1	2007-04-17 01:11:30	2007-04-17 01:31:30	8.00E-08	0	8.42E-08	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-17 06:50:00	2007-04-17 07:38:00	480.00	500.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-17 08:22:00	2007-04-17 09:52:00	500.00	520.00		3	1	2007-04-17 09:05:34	2007-04-17 09:25:34	2.92E-06	0	3.02E-06	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-17 10:40:00	2007-04-17 11:29:00	520.00	540.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-17 13:13:00	2007-04-17 14:02:00	540.00	560.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-17 14:39:00	2007-04-17 15:28:00	560.00	580.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-17 17:01:00	2007-04-17 17:56:00	580.00	600.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-17 18:29:00	2007-04-17 19:23:00	600.00	620.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-17 19:54:00	2007-04-17 21:59:00	620.00	640.00		3	1	2007-04-17 20:37:13	2007-04-17 20:57:13	2.05E-05	0	2.32E-05	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-18 06:55:00	2007-04-18 07:46:00	680.00	700.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-18 08:32:00	2007-04-18 10:34:00	700.00	720.00		3	1	2007-04-18 09:32:25	2007-04-18 09:52:25	2.67E-07	0	4.88E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-18 11:25:00	2007-04-18 13:21:00	720.00	740.00		3	1	2007-04-18 12:19:09	2007-04-18 12:39:09	1.67E-07	0	2.52E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-18 14:06:00	2007-04-18 16:13:00	740.00	760.00		3	1	2007-04-18 15:31:21	2007-04-18 15:51:21	1.67E-08	0	5.20E-08	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-18 16:45:00	2007-04-18 18:35:00	760.00	780.00		3	1	2007-04-18 17:53:22	2007-04-18 18:13:22	1.83E-07	0	2.30E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-18 19:14:00	2007-04-18 22:09:00	780.00	800.00		3	1	2007-04-18 20:17:15	2007-04-18 20:37:15	8.33E-08	0	1.21E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-18 23:25:00	2007-04-19 01:11:00	800.00	820.00		3	1	2007-04-19 00:29:48	2007-04-19 00:49:48	1.00E-07	0	1.31E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-19 01:51:00	2007-04-19 02:43:00	820.00	840.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-19 07:59:00	2007-04-19 09:31:00	840.00	860.00		3	1	2007-04-19 08:44:31	2007-04-19 09:04:31	5.33E-07	0	5.98E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-19 10:19:00	2007-04-19 13:12:00	860.00	880.00		3	1	2007-04-19 11:50:52	2007-04-19 12:10:52	2.83E-08	0	2.83E-08	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-19 14:46:00	2007-04-19 15:34:00	880.00	900.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-19 16:30:00	2007-04-19 17:21:00	900.00	920.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-19 17:52:00	2007-04-19 18:22:00	920.00	940.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-19 20:42:00	2007-04-19 21:31:00	940.00	960.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-19 22:03:00	2007-04-19 22:53:00	955.00	975.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-21 12:18:00	2007-04-21 14:33:00	380.00	385.00		3	1	2007-04-21 13:51:18	2007-04-21 14:11:18	1.10E-07	0	1.29E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-21 15:06:00	2007-04-21 16:31:00	385.00	390.00		3	1	2007-04-21 15:49:03	2007-04-21 16:09:03	2.00E-05	0	2.07E-05	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-21 16:56:00	2007-04-21 18:20:00	390.00	395.00		3	1	2007-04-21 17:38:05	2007-04-21 17:58:15	1.38E-05	0	1.43E-05	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-21 21:08:00	2007-04-21 22:31:00	400.00	405.00		3	1	2007-04-21 21:49:44	2007-04-21 22:09:54	9.17E-06	0	9.50E-06	1.67E-08	8.33E-04	1.00E+00

idcode	secup	seclow	dur_flow_phase_tp	dur_rec_phase_tf	initial_head_hi	ow_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 15A	80.00	180.00	1800	1800			7.34	1405	1441	1411	8.8						130.00
KLX 15A	180.00	280.00	1800	1800			6.98	2164	2365	2166	10.0						230.00
KLX 15A	280.00	380.00	1800	3600			7.95	2917	3116	2917	11.1						330.00
KLX 15A	380.00	480.00	1800	1800			7.65	3661	3862	3665	12.3						430.00
KLX 15A	480.00	580.00	1800	1800			8.48	4401	4602	4403	13.9						530.00
KLX 15A	580.00	680.00	1800	1800			9.53	5148	5345	5148	#NV						630.00
KLX 15A	680.00	780.00	1800	1800			#NV	5891	6091	5964	#NV						730.00
KLX 15A	780.00	880.00	1800	3600			11.04	6605	6801	6604	#NV						830.00
KLX 15A	80.00	100.00	1200	1200			7.38	805	1003	803	7.7						90.00
KLX 15A	100.00	120.00	1200	1200			7.10	954	1154	954	7.9						110.00
KLX 15A	120.00	140.00	1200	1200			7.46	1105	1137	1109	8.3						130.00
KLX 15A	140.00	160.00	1200	1200			7.41	1257	1457	1257	8.5						150.00
KLX 15A	160.00	180.00	1200	1200			7.44	1409	1609	1410	8.8						170.00
KLX 15A	180.00	200.00	1200	1200			7.65	1562	1762	1562	9.1						190.00
KLX 15A	200.00	220.00	1200	1200			6.34	1721	1921	1719	9.3						210.00
KLX 15A	220.00	240.00	1200	1200			5.95	1867	2067	1876	9.5						230.00
KLX 15A	240.00	260.00	1200	3600			6.82	2019	2215	2015	9.8						250.00
KLX 15A	260.00	280.00	1200	1200			7.12	2164	2456	2170	10.0						270.00
KLX 15A	280.00	300.00	1200	7200			7.98	2351	2549	2346	10.2						290.00
KLX 15A	300.00	320.00	#NV	#NV			#NV	#NV	#NV	#NV	10.4						310.00
KLX 15A	340.00	360.00	#NV	#NV			#NV	#NV	#NV	#NV	10.9						350.00
KLX 15A	360.00	380.00	1200	1200			8.14	2920	3119	2919	11.1						370.00
KLX 15A	380.00	400.00	1200	1200			8.12	3070	3292	3072	11.4						390.00
KLX 15A	400.00	420.00	1200	1200			8.57	3222	3422	3223	11.6						410.00
KLX 15A	420.00	440.00	#NV	#NV			#NV	#NV	#NV	#NV	11.8						430.00
KLX 15A	440.00	460.00	1200	1200			9.44	3520	3720	3543	12.1						450.00
KLX 15A	460.00	480.00	1200	14400			8.01	3669	3865	3663	12.3						470.00
KLX 15A	480.00	500.00	#NV	#NV			#NV	#NV	#NV	#NV	12.5						490.00
KLX 15A	500.00	520.00	1200	1200			8.09	3957	4157	3958	12.7						510.00
KLX 15A	520.00	540.00	#NV	#NV			#NV	#NV	#NV	#NV	13.0						530.00
KLX 15A	540.00	560.00	#NV	#NV			#NV	#NV	#NV	#NV	13.2						550.00
KLX 15A	560.00	580.00	#NV	#NV			#NV	#NV	#NV	#NV	13.4						570.00
KLX 15A	580.00	600.00	#NV	#NV			#NV	#NV	#NV	#NV	13.7						590.00
KLX 15A	600.00	620.00	#NV	#NV			#NV	#NV	#NV	#NV	13.9						610.00
KLX 15A	620.00	640.00	1200	3600			8.80	4849	5078	4849	14.2						630.00
KLX 15A	680.00	700.00	#NV	#NV			#NV	#NV	#NV	#NV	14.9						690.00
KLX 15A	700.00	720.00	1200	2400			#NV	5448	5648	5540	15.1						710.00
KLX 15A	720.00	740.00	1200	2400			10.46	5600	5799	5628	15.4						730.00
KLX 15A	740.00	760.00	1200	1200			10.13	5744	5938	5791	15.6						750.00
KLX 15A	760.00	780.00	1200	1200			10.72	5889	6089	5921	15.8						770.00
KLX 15A	780.00	800.00	1200	5400			#NV	6034	6236	6061	16.1						790.00
KLX 15A	800.00	820.00	1200	1200			10.13	6177	6378	6206	16.3						810.00
KLX 15A	820.00	840.00	#NV	#NV			#NV	#NV	#NV	#NV	16.6						830.00
KLX 15A	840.00	860.00	1200	1200			10.55	6457	6655	6459	16.8						850.00
KLX 15A	860.00	880.00	1200	3600			12.59	6617	6804	6646	17.0						870.00
KLX 15A	880.00	900.00	#NV	#NV			#NV	#NV	#NV	#NV	17.2						890.00
KLX 15A	900.00	920.00	#NV	#NV			#NV	#NV	#NV	#NV	17.5						910.00
KLX 15A	920.00	940.00	#NV	#NV			#NV	#NV	#NV	#NV	17.7						930.00
KLX 15A	940.00	960.00	#NV	#NV			#NV	#NV	#NV	#NV	17.9						950.00
KLX 15A	955.00	975.00	#NV	#NV			#NV	#NV	#NV	#NV	18.1						965.00
KLX 15A	380.00	385.00	1200	1200			8.03	2955	3178	2955	11.1						382.50
KLX 15A	385.00	390.00	1200	1200			7.82	2992	3192	2993	11.2						387.50
KLX 15A	390.00	395.00	1200	1200			7.85	3030	3246	3030	11.3						392.50
KLX 15A	400.00	405.00	1200	1200			7.97	3104	3314	3105	11.4						402.50

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 15A	2007-04-21 22:58:00	2007-04-21 23:47:00	405.00	410.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-22 00:11:00	2007-04-22 01:33:00	410.00	415.00		3	1	2007-04-22 00:51:49	2007-04-22 01:11:59	6.17E-06	0	6.23E-06	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-22 06:38:00	2007-04-22 07:26:00	415.00	420.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-22 08:18:00	2007-04-22 10:14:00	440.00	445.00		3	1	2007-04-22 09:32:33	2007-04-22 09:52:33	5.83E-08	0	6.77E-08	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-22 10:48:00	2007-04-22 11:37:00	445.00	450.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-22 13:05:00	2007-04-22 14:33:00	450.00	455.00		3	1	2007-04-22 13:51:43	2007-04-22 14:11:43	2.83E-07	0	3.13E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-22 15:03:00	2007-04-22 16:45:00	455.00	460.00		3	1	2007-04-22 16:03:13	2007-04-22 16:23:13	1.33E-07	0	1.53E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-22 17:10:00	2007-04-22 18:37:00	460.00	465.00		3	1	2007-04-22 17:55:12	2007-04-22 18:15:22	5.00E-08	0	5.50E-08	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-22 19:02:00	2007-04-22 20:50:00	465.00	470.00		3	1	2007-04-22 19:48:43	2007-04-22 20:08:53	4.17E-08	0	4.50E-08	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-22 21:41:00	2007-04-22 23:12:00	470.00	475.00		3	1	2007-04-22 22:30:41	2007-04-22 22:50:51	3.33E-08	0	3.67E-08	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-22 23:36:00	2007-04-23 00:24:00	475.00	480.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-23 00:58:00	2007-04-23 02:17:00	500.00	505.00		3	1	2007-04-23 01:35:50	2007-04-23 01:55:50	3.17E-06	0	3.37E-06	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-23 06:34:00	2007-04-23 07:23:00	505.00	510.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-23 07:57:00	2007-04-23 08:45:00	510.00	515.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-23 09:17:00	2007-04-23 10:05:00	515.00	520.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-23 13:19:00	2007-04-23 14:08:00	620.00	625.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-23 14:31:00	2007-04-23 16:01:00	623.00	628.00		3	1	2007-04-23 15:19:39	2007-04-23 15:39:39	5.00E-08	0	6.00E-08	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-23 16:25:00	2007-04-23 17:57:00	628.00	633.00		3	1	2007-04-23 17:15:18	2007-04-23 17:35:28	1.88E-05	0	2.07E-05	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-23 18:21:00	2007-04-23 19:41:00	630.00	635.00		3	1	2007-04-23 18:59:26	2007-04-23 19:19:36	1.92E-05	0	2.11E-05	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-23 20:25:00	2007-04-23 22:02:00	635.00	640.00		3	1	2007-04-23 21:20:29	2007-04-23 21:40:39	2.00E-08	0	2.17E-08	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-23 22:41:00	2007-04-23 23:30:00	660.00	665.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-23 23:55:00	2007-04-24 01:02:00	665.00	670.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-24 01:07:00	2007-04-24 01:55:00	670.00	675.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-24 06:35:00	2007-04-24 07:25:00	675.00	680.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-24 08:09:00	2007-04-24 08:58:00	700.00	705.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-24 09:27:00	2007-04-24 12:06:00	705.00	710.00		3	1	2007-04-24 10:46:02	2007-04-24 11:06:02	2.50E-07	0	4.75E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-24 12:23:00	2007-04-24 13:15:00	710.00	715.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-24 13:42:00	2007-04-24 14:31:00	715.00	720.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-24 15:00:00	2007-04-24 15:49:00	720.00	725.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-24 16:16:00	2007-04-24 17:04:00	725.00	730.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-24 17:29:00	2007-04-24 18:18:00	730.00	735.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-24 18:46:00	2007-04-24 20:38:00	735.00	740.00		3	1	2007-04-24 19:36:10	2007-04-24 19:56:20	1.65E-07	0	2.12E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-24 23:35:00	2007-04-25 00:24:00	745.00	750.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-25 00:48:00	2007-04-25 01:37:00	750.00	755.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-25 06:31:00	2007-04-25 07:20:00	755.00	760.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-25 07:45:00	2007-04-25 08:33:00	760.00	765.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-25 13:20:00	2007-04-25 17:15:00	770.00	775.00		3	1	2007-04-25 16:33:08	2007-04-25 16:53:08	1.15E-07	0	1.47E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-25 17:38:00	2007-04-25 19:01:00	775.00	780.00		3	1	2007-04-25 18:19:22	2007-04-25 18:39:22	5.67E-08	0	6.50E-08	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-25 21:31:00	2007-04-25 22:19:00	785.00	790.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-25 22:42:00	2007-04-26 00:12:00	790.00	795.00		3	1	2007-04-25 23:30:07	2007-04-25 23:50:07	7.33E-08	0	1.05E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-26 00:40:00	2007-04-26 01:26:00	795.00	800.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-26 06:31:00	2007-04-26 07:20:00	800.00	805.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-26 12:24:00	2007-04-26 13:13:00	805.00	810.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-26 13:40:00	2007-04-26 15:11:00	810.00	815.00		3	1	2007-04-26 14:29:43	2007-04-26 14:49:43	8.33E-08	0	1.17E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-26 15:35:00	2007-04-26 16:24:00	815.00	820.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-26 17:00:00	2007-04-26 18:41:00	840.00	845.00		3	1	2007-04-26 17:59:03	2007-04-26 18:19:03	1.67E-08	0	1.83E-08	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-26 19:05:00	2007-04-26 20:28:00	845.00	850.00		3	1	2007-04-26 19:46:05	2007-04-26 20:06:05	1.67E-07	0	1.83E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-26 21:12:00	2007-04-26 22:01:00	850.00	855.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-26 22:24:00	2007-04-26 23:47:00	855.00	860.00		3	1	2007-04-26 23:05:41	2007-04-26 23:25:41	1.67E-07	0	1.93E-07	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-27 00:09:00	2007-04-27 01:16:00	860.00	865.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-27 01:20:00	2007-04-27 03:30:00	865.00	870.00		3	1	2007-04-27 02:08:32	2007-04-27 02:28:32	2.17E-08	0	2.52E-08	1.67E-08	8.33E-04	1.00E+00
KLX 15A	2007-04-27 06:28:00	2007-04-27 07:17:00	870.00	875.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-27 07:43:00	2007-04-27 08:23:00	875.00	880.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 15A	2007-04-28 10:58:00	2007-04-28 13:52:00	970.00	1000.43		3	1	2007-04-28 12:50:12	2007-04-28 13:10:12	6.67E-07	0	7.17E-07	1.67E-08	8.33E-04	1.00E+00

idcode	secup	seclow	dur_flow_phase_tp	dur_rec_phase_tf	initial_head_hi	ow_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 15A	405.00	410.00	#NV	#NV			#NV	#NV	#NV	#NV	11.4						407.50
KLX 15A	410.00	415.00	1200	1200			8.11	3180	3379	3180	11.5						412.50
KLX 15A	415.00	420.00	#NV	#NV			#NV	#NV	#NV	#NV	11.5						417.50
KLX 15A	440.00	445.00	1200	1200			8.39	3448	3670	3452	11.8						442.50
KLX 15A	445.00	450.00	#NV	#NV			#NV	#NV	#NV	#NV	11.9						447.50
KLX 15A	450.00	455.00	1200	1200			8.63	3477	3677	3494	12.0						452.50
KLX 15A	455.00	460.00	1200	1200			#NV	3518	3718	3525	12.0						457.50
KLX 15A	460.00	465.00	1200	1200			8.48	3557	3759	3559	12.1						462.50
KLX 15A	465.00	470.00	1200	1200			8.29	3594	3821	3594	12.1						467.50
KLX 15A	470.00	475.00	1200	1200			8.61	3637	3849	3647	12.2						472.50
KLX 15A	475.00	480.00	#NV	#NV			#NV	#NV	#NV	#NV	12.2						477.50
KLX 15A	500.00	505.00	1200	1200			8.21	3848	4050	3848	12.5						502.50
KLX 15A	505.00	510.00	#NV	#NV			#NV	#NV	#NV	#NV	12.6						507.50
KLX 15A	510.00	515.00	#NV	#NV			#NV	#NV	#NV	#NV	12.6						512.50
KLX 15A	515.00	520.00	#NV	#NV			#NV	#NV	#NV	#NV	12.7						517.50
KLX 15A	620.00	625.00	#NV	#NV			#NV	#NV	#NV	#NV	14.0						622.50
KLX 15A	623.00	628.00	1200	1200			8.95	4763	4987	4763	#NV						625.50
KLX 15A	628.00	633.00	1200	1200			8.69	4800	5002	4798	#NV						630.50
KLX 15A	630.00	635.00	1200	1200			8.49	4812	5012	4813	#NV						632.50
KLX 15A	635.00	640.00	1200	1200			9.54	4863	5073	4861	#NV						637.50
KLX 15A	660.00	665.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						662.50
KLX 15A	665.00	670.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						667.50
KLX 15A	670.00	675.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						672.50
KLX 15A	675.00	680.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						677.50
KLX 15A	700.00	705.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						702.50
KLX 15A	705.00	710.00	1200	2400			#NV	5373	5572	5465	#NV						707.50
KLX 15A	710.00	715.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						712.50
KLX 15A	715.00	720.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						717.50
KLX 15A	720.00	725.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						722.50
KLX 15A	725.00	730.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						727.50
KLX 15A	730.00	735.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						732.50
KLX 15A	735.00	740.00	1200	2400			10.01	5601	5800	5624	#NV						737.50
KLX 15A	745.00	750.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						747.50
KLX 15A	750.00	755.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						752.50
KLX 15A	755.00	760.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						757.50
KLX 15A	760.00	765.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						762.50
KLX 15A	770.00	775.00	1200	1200			10.52	5854	6044	5879	#NV						772.50
KLX 15A	775.00	780.00	1200	1200			13.60	5900	6080	5927	#NV						777.50
KLX 15A	785.00	790.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						787.50
KLX 15A	790.00	795.00	1200	1200			12.71	5997	6187	6058	#NV						792.50
KLX 15A	795.00	800.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						797.50
KLX 15A	800.00	805.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						802.50
KLX 15A	805.00	810.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						807.50
KLX 15A	810.00	815.00	1200	1200			11.18	6143	6343	6170	#NV						812.50
KLX 15A	815.00	820.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						817.50
KLX 15A	840.00	845.00	1200	1200			17.15	6400	6564	6419	#NV						842.50
KLX 15A	845.00	850.00	1200	1200			11.52	6391	6630	6392	#NV						847.50
KLX 15A	850.00	855.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						852.50
KLX 15A	855.00	860.00	1200	1200			9.91	6462	6662	6468	#NV						857.50
KLX 15A	860.00	865.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						862.50
KLX 15A	865.00	870.00	1200	3600			12.76	6547	6728	6548	#NV						867.50
KLX 15A	870.00	875.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						872.50
KLX 15A	875.00	880.00	#NV	#NV			#NV	#NV	#NV	#NV	#NV						877.50
KLX 15A	970.00	1000.43	1200	2400			12.07	7301	7501	7301	#NV						985.22

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 15A	2007-04-12 07:48:00	2007-04-12 10:08:00	80.00	180.00		3	1	130.00	100	1.20E-04	0				1.57E-04
KLX 15A	2007-04-12 13:56:00	2007-04-12 16:07:00	180.00	280.00		3	1	230.00	100	6.26E-06	0				8.16E-06
KLX 15A	2007-04-12 17:54:00	2007-04-12 20:31:00	280.00	380.00		3	1	330.00	100	1.40E-08	0				1.82E-08
KLX 15A	2007-04-12 22:07:00	2007-04-12 23:57:00	380.00	480.00		3	1	430.00	100	1.56E-06	0				2.03E-06
KLX 15A	2007-04-13 06:20:00	2007-04-13 08:19:00	480.00	580.00		3	1	530.00	100	1.11E-07	0				1.45E-07
KLX 15A	2007-04-13 10:28:00	2007-04-13 12:19:00	580.00	680.00		3	1	630.00	100	6.77E-07	0				8.82E-07
KLX 15A	2007-04-13 15:02:00	2007-04-13 17:27:00	680.00	780.00		3	1	730.00	100	2.53E-08	0				3.30E-08
KLX 15A	2007-04-13 19:23:00	2007-04-13 21:53:00	780.00	880.00		3	1	830.00	100	3.25E-08	0				4.24E-08
KLX 15A	2007-04-14 19:23:00	2007-04-14 20:46:00	80.00	100.00		3	1	90.00	20	2.63E-06	0				2.76E-06
KLX 15A	2007-04-14 22:09:00	2007-04-14 23:32:00	100.00	120.00		3	1	110.00	20	2.40E-06	0				2.51E-06
KLX 15A	2007-04-15 00:09:00	2007-04-15 01:31:00	120.00	140.00		3	1	130.00	20	1.32E-04	0				1.38E-04
KLX 15A	2007-04-15 07:52:00	2007-04-15 09:21:00	140.00	160.00		3	1	150.00	20	2.19E-06	0				2.29E-06
KLX 15A	2007-04-15 10:15:00	2007-04-15 11:42:00	160.00	180.00		3	1	170.00	20	8.67E-08	0				9.06E-08
KLX 15A	2007-04-15 12:35:00	2007-04-15 14:01:00	180.00	200.00		3	1	190.00	20	7.93E-07	0				8.30E-07
KLX 15A	2007-04-15 14:59:00	2007-04-15 16:43:00	200.00	220.00		3	1	210.00	20	2.45E-09	0				2.57E-09
KLX 15A	2007-04-15 17:16:00	2007-04-15 19:09:00	220.00	240.00		3	1	230.00	20	4.09E-09	0				4.28E-09
KLX 15A	2007-04-15 19:47:00	2007-04-15 22:15:00	240.00	260.00		3	1	250.00	20	1.67E-09	0				1.75E-09
KLX 15A	2007-04-15 22:53:00	2007-04-16 00:21:00	260.00	280.00		3	1	270.00	20	5.38E-06	0				5.62E-06
KLX 15A	2007-04-16 00:56:00	2007-04-16 04:49:00	280.00	300.00		3	1	290.00	20	1.02E-09	0				1.06E-09
KLX 15A	2007-04-16 06:46:00	2007-04-16 07:39:00	300.00	320.00		3	1	310.00	20	#NV	-1				#NV
KLX 15A	2007-04-16 11:08:00	2007-04-16 11:57:00	340.00	360.00		3	1	350.00	20	#NV	-1				#NV
KLX 15A	2007-04-16 13:33:00	2007-04-16 15:03:00	360.00	380.00		3	1	370.00	20	1.56E-08	0				1.63E-08
KLX 15A	2007-04-16 15:49:00	2007-04-16 17:16:00	380.00	400.00		3	1	390.00	20	1.09E-06	0				1.14E-06
KLX 15A	2007-04-16 17:49:00	2007-04-16 19:13:00	400.00	420.00		3	1	410.00	20	6.99E-07	0				7.31E-07
KLX 15A	2007-04-16 19:51:00	2007-04-16 20:47:00	420.00	440.00		3	1	430.00	20	#NV	-1				#NV
KLX 15A	2007-04-16 22:04:00	2007-04-16 23:37:00	440.00	460.00		3	1	450.00	20	1.96E-08	0				2.05E-08
KLX 15A	2007-04-17 00:11:00	2007-04-17 05:32:00	460.00	480.00		3	1	470.00	20	4.00E-09	0				4.19E-09
KLX 15A	2007-04-17 06:50:00	2007-04-17 07:38:00	480.00	500.00		3	1	490.00	20	#NV	-1				#NV
KLX 15A	2007-04-17 08:22:00	2007-04-17 09:52:00	500.00	520.00		3	1	510.00	20	1.43E-07	0				1.50E-07
KLX 15A	2007-04-17 10:40:00	2007-04-17 11:29:00	520.00	540.00		3	1	530.00	20	#NV	-1				#NV
KLX 15A	2007-04-17 13:13:00	2007-04-17 14:02:00	540.00	560.00		3	1	550.00	20	#NV	-1				#NV
KLX 15A	2007-04-17 14:39:00	2007-04-17 15:28:00	560.00	580.00		3	1	570.00	20	#NV	-1				#NV
KLX 15A	2007-04-17 17:01:00	2007-04-17 17:56:00	580.00	600.00		3	1	590.00	20	#NV	-1				#NV
KLX 15A	2007-04-17 18:29:00	2007-04-17 19:23:00	600.00	620.00		3	1	610.00	20	#NV	-1				#NV
KLX 15A	2007-04-17 19:54:00	2007-04-17 21:59:00	620.00	640.00		3	1	630.00	20	8.78E-07	0				9.19E-07
KLX 15A	2007-04-18 06:55:00	2007-04-18 07:46:00	680.00	700.00		3	1	690.00	20	#NV	-1				#NV
KLX 15A	2007-04-18 08:32:00	2007-04-18 10:34:00	700.00	720.00		3	1	710.00	20	1.31E-08	0				1.37E-08
KLX 15A	2007-04-18 11:25:00	2007-04-18 13:21:00	720.00	740.00		3	1	730.00	20	8.22E-09	0				8.59E-09
KLX 15A	2007-04-18 14:06:00	2007-04-18 16:13:00	740.00	760.00		3	1	750.00	20	8.43E-10	0				8.82E-10
KLX 15A	2007-04-18 16:45:00	2007-04-18 18:35:00	760.00	780.00		3	1	770.00	20	8.99E-09	0				9.41E-09
KLX 15A	2007-04-18 19:14:00	2007-04-18 22:09:00	780.00	800.00		3	1	790.00	20	4.05E-09	0				4.23E-09
KLX 15A	2007-04-18 23:25:00	2007-04-19 01:11:00	800.00	820.00		3	1	810.00	20	4.88E-09	0				5.11E-09
KLX 15A	2007-04-19 01:51:00	2007-04-19 02:43:00	820.00	840.00		3	1	830.00	20	#NV	-1				#NV
KLX 15A	2007-04-19 07:59:00	2007-04-19 09:31:00	840.00	860.00		3	1	850.00	20	2.64E-08	0				2.76E-08
KLX 15A	2007-04-19 10:19:00	2007-04-19 13:12:00	860.00	880.00		3	1	870.00	20	1.49E-09	0				1.55E-09
KLX 15A	2007-04-19 14:46:00	2007-04-19 15:34:00	880.00	900.00		3	1	890.00	20	#NV	-1				#NV
KLX 15A	2007-04-19 16:30:00	2007-04-19 17:21:00	900.00	920.00		3	1	910.00	20	#NV	-1				#NV
KLX 15A	2007-04-19 17:52:00	2007-04-19 18:22:00	920.00	940.00		3	1	930.00	20	#NV	-1				#NV
KLX 15A	2007-04-19 20:42:00	2007-04-19 21:31:00	940.00	960.00		3	1	950.00	20	#NV	-1				#NV
KLX 15A	2007-04-19 22:03:00	2007-04-19 22:53:00	955.00	975.00		3	1	965.00	20	#NV	-1				#NV
KLX 15A	2007-04-21 12:18:00	2007-04-21 14:33:00	380.00	385.00		3	1	382.50	5	4.82E-09	0				3.99E-09
KLX 15A	2007-04-21 15:06:00	2007-04-21 16:31:00	385.00	390.00		3	1	387.50	5	9.81E-07	0				8.10E-07
KLX 15A	2007-04-21 16:56:00	2007-04-21 18:20:00	390.00	395.00		3	1	392.50	5	6.28E-07	0				5.19E-07
KLX 15A	2007-04-21 21:08:00	2007-04-21 22:31:00	400.00	405.00		3	1	402.50	5	4.28E-07	0				3.53E-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 15A	80.00	180.00	0	0	1.57E-06									7.70E-05	0	1	3.00E-05	3.00E-04
KLX 15A	180.00	280.00	0	0	8.16E-08									1.41E-05	0	1	5.00E-06	3.00E-05
KLX 15A	280.00	380.00	0	0	1.82E-10									1.93E-08	0	1	5.00E-09	6.00E-08
KLX 15A	380.00	480.00	0	0	2.03E-08									2.77E-06	0	1	8.00E-05	5.00E-06
KLX 15A	480.00	580.00	0	0	1.45E-09									2.90E-07	0	1	3.00E-08	7.00E-07
KLX 15A	580.00	680.00	0	0	8.82E-09									1.50E-07	0	1	1.00E-07	3.00E-06
KLX 15A	680.00	780.00	0	0	3.30E-10									2.17E-08	0	1	5.00E-09	5.00E-08
KLX 15A	780.00	880.00	0	0	4.24E-10									3.65E-08	0	1	1.00E-08	8.00E-08
KLX 15A	80.00	100.00	0	0	1.38E-07									2.85E-06	0	1	7.00E-07	8.00E-06
KLX 15A	100.00	120.00	0	0	1.26E-07									4.10E-06	0	1	1.00E-06	2.00E-05
KLX 15A	120.00	140.00	0	0	6.90E-06									1.14E-04	0	1	3.00E-05	3.00E-04
KLX 15A	140.00	160.00	0	0	1.15E-07									3.60E-06	0	1	8.00E-07	3.00E-05
KLX 15A	160.00	180.00	0	0	4.53E-09									1.36E-07	0	1	7.00E-08	6.00E-07
KLX 15A	180.00	200.00	0	0	4.15E-08									1.60E-06	0	1	2.00E-07	5.00E-06
KLX 15A	200.00	220.00	0	0	1.29E-10									2.57E-09	0	1	8.00E-10	5.00E-09
KLX 15A	220.00	240.00	0	0	2.14E-10									5.49E-09	0	1	7.00E-10	7.00E-09
KLX 15A	240.00	260.00	0	0	8.75E-11									3.64E-09	0	1	8.00E-10	5.00E-09
KLX 15A	260.00	280.00	0	0	2.81E-07									1.13E-05	0	1	8.00E-06	3.00E-05
KLX 15A	280.00	300.00	0	0	5.30E-11									3.35E-10	0	1	1.00E-10	3.00E-09
KLX 15A	300.00	320.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	340.00	360.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	360.00	380.00	0	0	8.15E-10									2.19E-08	0	1	7.00E-09	8.00E-08
KLX 15A	380.00	400.00	0	0	5.70E-08									2.41E-06	0	1	8.00E-07	5.00E-06
KLX 15A	400.00	420.00	0	0	3.66E-08									1.91E-06	0	1	5.00E-07	4.00E-06
KLX 15A	420.00	440.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	440.00	460.00	0	0	1.03E-09									1.41E-08	0	1	8.00E-09	3.00E-08
KLX 15A	460.00	480.00	0	0	2.10E-10									6.10E-09	0	1	1.00E-09	1.00E-08
KLX 15A	480.00	500.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	500.00	520.00	0	0	7.50E-09									4.80E-07	0	1	1.00E-07	8.00E-07
KLX 15A	520.00	540.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	540.00	560.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	560.00	580.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	580.00	600.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	600.00	620.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	620.00	640.00	0	0	4.60E-08									2.30E-07	0	1	8.00E-08	3.00E-06
KLX 15A	680.00	700.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	700.00	720.00	0	0	6.85E-10									8.06E-09	0	1	1.00E-09	3.00E-08
KLX 15A	720.00	740.00	0	0	4.30E-10									4.19E-09	0	1	1.00E-09	1.00E-08
KLX 15A	740.00	760.00	0	0	4.41E-11									6.05E-10	0	1	2.00E-10	1.00E-09
KLX 15A	760.00	780.00	0	0	4.71E-10									3.03E-09	0	1	8.00E-10	6.00E-09
KLX 15A	780.00	800.00	0	0	2.12E-10									2.32E-09	0	1	7.00E-10	5.00E-09
KLX 15A	800.00	820.00	0	0	2.56E-10									3.82E-09	0	1	1.00E-09	8.00E-09
KLX 15A	820.00	840.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	840.00	860.00	0	0	1.38E-09									6.13E-08	0	1	2.00E-08	1.00E-07
KLX 15A	860.00	880.00	0	0	7.75E-11									1.40E-09	0	1	5.00E-10	6.00E-09
KLX 15A	880.00	900.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	900.00	920.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	920.00	940.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	940.00	960.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	955.00	975.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	380.00	385.00	0	0	7.98E-10									7.13E-09	0	1	1.00E-09	4.00E-08
KLX 15A	385.00	390.00	0	0	1.62E-07									2.63E-06	0	1	1.00E-06	4.00E-06
KLX 15A	390.00	395.00	0	0	1.04E-07									9.11E-07	0	1	5.00E-07	2.00E-06
KLX 15A	400.00	405.00	0	0	7.06E-08									1.53E-06	0	1	8.00E-07	3.00E-06

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 15A	80.00	180.00	1.00E-06	1.00E-06		283.90	0								1.49E-07	1.6E+01	2.7	183.0	1367.4
KLX 15A	180.00	280.00	1.00E-06	1.00E-06		185.72	-1								4.76E-08	5.2E+00	4.1	555.0	1267.2
KLX 15A	280.00	380.00	1.00E-06	1.00E-06		35.72	0								2.68E-10	3.0E-02	3.5	186.6	1392.0
KLX 15A	380.00	480.00	1.00E-06	1.00E-06		123.64	-1								2.48E-09	2.7E-01	3.0	129.0	538.8
KLX 15A	480.00	580.00	1.00E-06	1.00E-06		70.33	0								1.31E-10	1.4E-02	9.7	66.6	1383.6
KLX 15A	580.00	680.00	1.00E-06	1.00E-06		22.92	-1								2.96E-10	3.3E-02	-4.7	108.6	265.8
KLX 15A	680.00	780.00	1.00E-06	1.00E-06		12.40	1								4.96E-10	5.5E-02	-3.1	61.8	204.6
KLX 15A	780.00	880.00	1.00E-06	1.00E-06		59.24	0								2.68E-10	3.0E-02	0.6	634.8	2830.2
KLX 15A	80.00	100.00	1.00E-06	1.00E-06		42.17	-1								6.44E-10	7.1E-02	-2.1	19.8	206.4
KLX 15A	100.00	120.00	1.00E-06	1.00E-06		19.61	-1								7.75E-10	8.5E-02	3.5	18.6	37.2
KLX 15A	120.00	140.00	1.00E-06	1.00E-06		91.84	1								2.51E-08	2.8E+00	-5.1	9.0	154.8
KLX 15A	140.00	160.00	1.00E-06	1.00E-06		107.79	0								1.93E-09	2.1E-01	-3.2	149.4	557.4
KLX 15A	160.00	180.00	1.00E-06	1.00E-06		47.52	0								3.89E-10	4.3E-02	3.9	60.0	1018.2
KLX 15A	180.00	200.00	1.00E-06	1.00E-06		88.01	0								5.11E-10	5.6E-02	-3.0	175.2	853.8
KLX 15A	200.00	220.00	1.00E-06	1.00E-06		17.62	0								5.09E-11	5.6E-03	2.5	29.4	804.0
KLX 15A	220.00	240.00	1.00E-06	1.00E-06		21.30	0								6.85E-11	7.5E-03	-1.7	#NV	#NV
KLX 15A	240.00	260.00	1.00E-06	1.00E-06		33.29	-1								6.19E-11	6.8E-03	2.5	#NV	#NV
KLX 15A	260.00	280.00	1.00E-06	1.00E-06		143.47	0								4.57E-08	5.0E+00	4.2	#NV	#NV
KLX 15A	280.00	300.00	1.00E-06	1.00E-06		10.59	0								1.25E-10	1.4E-02	-1.5	137.4	837.0
KLX 15A	300.00	320.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	340.00	360.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	360.00	380.00	1.00E-06	1.00E-06		30.10	0								4.52E-11	5.0E-03	3.6	70.2	915.6
KLX 15A	380.00	400.00	1.00E-06	1.00E-06		97.50	0								2.43E-09	2.7E-01	5.6	227.4	969.0
KLX 15A	400.00	420.00	1.00E-06	1.00E-06		91.99	0								2.36E-10	2.6E-02	8.7	27.6	634.8
KLX 15A	420.00	440.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	440.00	460.00	1.00E-06	1.00E-06		26.97	0								9.51E-11	1.0E-02	-1.2	237.6	848.4
KLX 15A	460.00	480.00	1.00E-06	1.00E-06		26.78	1								5.33E-11	5.9E-03	4.9	771.0	1799.4
KLX 15A	480.00	500.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	500.00	520.00	1.00E-06	1.00E-06		65.13	0								3.57E-11	3.9E-03	13.9	91.2	908.4
KLX 15A	520.00	540.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	540.00	560.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	560.00	580.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	580.00	600.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	600.00	620.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	620.00	640.00	1.00E-06	1.00E-06		25.22	-1								9.72E-10	1.1E-01	-4.6	111.0	259.8
KLX 15A	680.00	700.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	700.00	720.00	1.00E-06	1.00E-06		9.07	1								1.44E-10	1.6E-02	-3.7	58.8	179.4
KLX 15A	720.00	740.00	1.00E-06	1.00E-06		9.64	1								1.53E-10	1.7E-02	-2.6	70.8	281.4
KLX 15A	740.00	760.00	1.00E-06	1.00E-06		12.27	0								8.41E-11	9.3E-03	-1.7	#NV	#NV
KLX 15A	760.00	780.00	1.00E-06	1.00E-06		18.36	0								5.04E-11	5.6E-03	-2.6	112.2	1045.8
KLX 15A	780.00	800.00	1.00E-06	1.00E-06		10.16	1								1.29E-10	1.4E-02	-1.9	139.8	639.6
KLX 15A	800.00	820.00	1.00E-06	1.00E-06		10.92	1								5.73E-11	6.3E-03	-0.9	58.8	378.0
KLX 15A	820.00	840.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	840.00	860.00	1.00E-06	1.00E-06		38.94	0								3.93E-11	4.3E-03	7.7	126.6	940.8
KLX 15A	860.00	880.00	1.00E-06	1.00E-06		15.14	0								6.10E-11	6.7E-03	2.6	38.4	566.4
KLX 15A	880.00	900.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	900.00	920.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	920.00	940.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	940.00	960.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	955.00	975.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	380.00	385.00	1.00E-06	1.00E-06		7.96	1								1.65E-11	1.8E-03	3.2	13.8	147.0
KLX 15A	385.00	390.00	1.00E-06	1.00E-06		99.65	0								2.22E-09	2.4E-01	9.2	70.2	780.6
KLX 15A	390.00	395.00	1.00E-06	1.00E-06		76.45	0								2.15E-09	2.4E-01	2.2	35.4	996.0
KLX 15A	400.00	405.00	1.00E-06	1.00E-06		87.03	0								2.96E-10	3.3E-02	14.4	66.6	663.6

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 15A	80.00	180.00					1407.6													
KLX 15A	180.00	280.00					2157.8													
KLX 15A	280.00	380.00					2916.3													
KLX 15A	380.00	480.00					3657.5													
KLX 15A	480.00	580.00					4403.1													
KLX 15A	580.00	680.00					5145.1													
KLX 15A	680.00	780.00					#NV													
KLX 15A	780.00	880.00					6601.3													
KLX 15A	80.00	100.00					801.0													
KLX 15A	100.00	120.00					950.5													
KLX 15A	120.00	140.00					1105.9													
KLX 15A	140.00	160.00					1256.9													
KLX 15A	160.00	180.00					1408.5													
KLX 15A	180.00	200.00					1561.9													
KLX 15A	200.00	220.00					1700.2													
KLX 15A	220.00	240.00					1847.1													
KLX 15A	240.00	260.00					2006.1													
KLX 15A	260.00	280.00					2159.2													
KLX 15A	280.00	300.00					2301.1													
KLX 15A	300.00	320.00					#NV													
KLX 15A	340.00	360.00					#NV													
KLX 15A	360.00	380.00					2918.2													
KLX 15A	380.00	400.00					3067.2													
KLX 15A	400.00	420.00					3220.8													
KLX 15A	420.00	440.00					#NV													
KLX 15A	440.00	460.00					3526.8													
KLX 15A	460.00	480.00					3661.1													
KLX 15A	480.00	500.00					#NV													
KLX 15A	500.00	520.00					3957.5													
KLX 15A	520.00	540.00					#NV													
KLX 15A	540.00	560.00					#NV													
KLX 15A	560.00	580.00					#NV													
KLX 15A	580.00	600.00					#NV													
KLX 15A	600.00	620.00					#NV													
KLX 15A	620.00	640.00					4845.7													
KLX 15A	680.00	700.00					#NV													
KLX 15A	700.00	720.00					#NV													
KLX 15A	720.00	740.00					5586.4													
KLX 15A	740.00	760.00					5731.5													
KLX 15A	760.00	780.00					5881.5													
KLX 15A	780.00	800.00					#NV													
KLX 15A	800.00	820.00					6163.3													
KLX 15A	820.00	840.00					#NV													
KLX 15A	840.00	860.00					6453.7													
KLX 15A	860.00	880.00					6616.6													
KLX 15A	880.00	900.00					#NV													
KLX 15A	900.00	920.00					#NV													
KLX 15A	920.00	940.00					#NV													
KLX 15A	940.00	960.00					#NV													
KLX 15A	955.00	975.00					#NV													
KLX 15A	380.00	385.00					2954.4													
KLX 15A	385.00	390.00					2989.7													
KLX 15A	390.00	395.00					3027.3													
KLX 15A	400.00	405.00					3103.1													

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 15A	2007-04-21 22:58:00	2007-04-21 23:47:00	405.00	410.00		3	1	407.50	5	#NV	-1				#NV
KLX 15A	2007-04-22 00:11:00	2007-04-22 01:33:00	410.00	415.00		3	1	412.50	5	3.04E-07	0				2.51E-07
KLX 15A	2007-04-22 06:38:00	2007-04-22 07:26:00	415.00	420.00		3	1	417.50	5	#NV	-1				#NV
KLX 15A	2007-04-22 08:18:00	2007-04-22 10:14:00	440.00	445.00		3	1	442.50	5	2.58E-09	0				2.13E-09
KLX 15A	2007-04-22 10:48:00	2007-04-22 11:37:00	445.00	450.00		3	1	447.50	5	#NV	-1				#NV
KLX 15A	2007-04-22 13:05:00	2007-04-22 14:33:00	450.00	455.00		3	1	452.50	5	1.39E-08	0				1.15E-08
KLX 15A	2007-04-22 15:03:00	2007-04-22 16:45:00	455.00	460.00		3	1	457.50	5	6.54E-09	0				5.40E-09
KLX 15A	2007-04-22 17:10:00	2007-04-22 18:37:00	460.00	465.00		3	1	462.50	5	2.43E-09	0				2.00E-09
KLX 15A	2007-04-22 19:02:00	2007-04-22 20:50:00	465.00	470.00		3	1	467.50	5	1.80E-09	0				1.49E-09
KLX 15A	2007-04-22 21:41:00	2007-04-22 23:12:00	470.00	475.00		3	1	472.50	5	1.54E-09	0				1.27E-09
KLX 15A	2007-04-22 23:36:00	2007-04-23 00:24:00	475.00	480.00		3	1	477.50	5	#NV	-1				#NV
KLX 15A	2007-04-23 00:58:00	2007-04-23 02:17:00	500.00	505.00		3	1	502.50	5	1.54E-07	0				1.27E-07
KLX 15A	2007-04-23 06:34:00	2007-04-23 07:23:00	505.00	510.00		3	1	507.50	5	#NV	-1				#NV
KLX 15A	2007-04-23 07:57:00	2007-04-23 08:45:00	510.00	515.00		3	1	512.50	5	#NV	-1				#NV
KLX 15A	2007-04-23 09:17:00	2007-04-23 10:05:00	515.00	520.00		3	1	517.50	5	#NV	-1				#NV
KLX 15A	2007-04-23 13:19:00	2007-04-23 14:08:00	620.00	625.00		3	1	622.50	5	#NV	-1				#NV
KLX 15A	2007-04-23 14:31:00	2007-04-23 16:01:00	623.00	628.00		3	1	625.50	5	2.19E-09	0				1.81E-09
KLX 15A	2007-04-23 16:25:00	2007-04-23 17:57:00	628.00	633.00		3	1	630.50	5	9.11E-07	0				7.52E-07
KLX 15A	2007-04-23 18:21:00	2007-04-23 19:41:00	630.00	635.00		3	1	632.50	5	9.43E-07	0				7.79E-07
KLX 15A	2007-04-23 20:25:00	2007-04-23 22:02:00	635.00	640.00		3	1	637.50	5	9.34E-10	0				7.71E-10
KLX 15A	2007-04-23 22:41:00	2007-04-23 23:30:00	660.00	665.00		3	1	662.50	5	#NV	-1				#NV
KLX 15A	2007-04-23 23:55:00	2007-04-24 01:02:00	665.00	670.00		3	1	667.50	5	#NV	-1				#NV
KLX 15A	2007-04-24 01:07:00	2007-04-24 01:55:00	670.00	675.00		3	1	672.50	5	#NV	-1				#NV
KLX 15A	2007-04-24 06:35:00	2007-04-24 07:25:00	675.00	680.00		3	1	677.50	5	#NV	-1				#NV
KLX 15A	2007-04-24 08:09:00	2007-04-24 08:58:00	700.00	705.00		3	1	702.50	5	#NV	-1				#NV
KLX 15A	2007-04-24 09:27:00	2007-04-24 12:06:00	705.00	710.00		3	1	707.50	5	1.23E-08	0				1.02E-08
KLX 15A	2007-04-24 12:23:00	2007-04-24 13:15:00	710.00	715.00		3	1	712.50	5	#NV	-1				#NV
KLX 15A	2007-04-24 13:42:00	2007-04-24 14:31:00	715.00	720.00		3	1	717.50	5	#NV	-1				#NV
KLX 15A	2007-04-24 15:00:00	2007-04-24 15:49:00	720.00	725.00		3	1	722.50	5	#NV	-1				#NV
KLX 15A	2007-04-24 16:16:00	2007-04-24 17:04:00	725.00	730.00		3	1	727.50	5	#NV	-1				#NV
KLX 15A	2007-04-24 17:29:00	2007-04-24 18:18:00	730.00	735.00		3	1	732.50	5	#NV	-1				#NV
KLX 15A	2007-04-24 18:46:00	2007-04-24 20:38:00	735.00	740.00		3	1	737.50	5	8.13E-09	0				6.71E-09
KLX 15A	2007-04-24 23:35:00	2007-04-25 00:24:00	745.00	750.00		3	1	747.50	5	#NV	-1				#NV
KLX 15A	2007-04-25 00:48:00	2007-04-25 01:37:00	750.00	755.00		3	1	752.50	5	#NV	-1				#NV
KLX 15A	2007-04-25 06:31:00	2007-04-25 07:20:00	755.00	760.00		3	1	757.50	5	#NV	-1				#NV
KLX 15A	2007-04-25 07:45:00	2007-04-25 08:33:00	760.00	765.00		3	1	762.50	5	#NV	-1				#NV
KLX 15A	2007-04-25 13:20:00	2007-04-25 17:15:00	770.00	775.00		3	1	772.50	5	5.94E-09	0				4.90E-09
KLX 15A	2007-04-25 17:38:00	2007-04-25 19:01:00	775.00	780.00		3	1	777.50	5	3.09E-09	0				2.55E-09
KLX 15A	2007-04-25 21:31:00	2007-04-25 22:19:00	785.00	790.00		3	1	787.50	5	#NV	-1				#NV
KLX 15A	2007-04-25 22:42:00	2007-04-26 00:12:00	790.00	795.00		3	1	792.50	5	3.79E-09	0				3.13E-09
KLX 15A	2007-04-26 00:40:00	2007-04-26 01:26:00	795.00	800.00		3	1	797.50	5	#NV	-1				#NV
KLX 15A	2007-04-26 06:31:00	2007-04-26 07:20:00	800.00	805.00		3	1	802.50	5	#NV	-1				#NV
KLX 15A	2007-04-26 12:24:00	2007-04-26 13:13:00	805.00	810.00		3	1	807.50	5	#NV	-1				#NV
KLX 15A	2007-04-26 13:40:00	2007-04-26 15:11:00	810.00	815.00		3	1	812.50	5	4.09E-09	0				3.37E-09
KLX 15A	2007-04-26 15:35:00	2007-04-26 16:24:00	815.00	820.00		3	1	817.50	5	#NV	-1				#NV
KLX 15A	2007-04-26 17:00:00	2007-04-26 18:41:00	840.00	845.00		3	1	842.50	5	9.97E-10	0				8.23E-10
KLX 15A	2007-04-26 19:05:00	2007-04-26 20:28:00	845.00	850.00		3	1	847.50	5	6.84E-09	0				5.65E-09
KLX 15A	2007-04-26 21:12:00	2007-04-26 22:01:00	850.00	855.00		3	1	852.50	5	#NV	-1				#NV
KLX 15A	2007-04-26 22:24:00	2007-04-26 23:47:00	855.00	860.00		3	1	857.50	5	8.81E-09	0				6.75E-09
KLX 15A	2007-04-27 00:09:00	2007-04-27 01:16:00	860.00	865.00		3	1	862.50	5	#NV	-1				#NV
KLX 15A	2007-04-27 01:20:00	2007-04-27 03:30:00	865.00	870.00		3	1	867.50	5	1.17E-09	0				9.69E-10
KLX 15A	2007-04-27 06:28:00	2007-04-27 07:17:00	870.00	875.00		3	1	872.50	5	#NV	-1				#NV
KLX 15A	2007-04-27 07:43:00	2007-04-27 08:23:00	875.00	880.00		3	1	877.50	5	#NV	-1				#NV
KLX 15A	2007-04-28 10:58:00	2007-04-28 13:52:00	970.00	1000.43		3	1	985.22	5	3.27E-08	0				3.64E-08

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 15A	405.00	410.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	410.00	415.00	0	0	5.02E-08									9.40E-07	0	1	5.00E-07	3.00E-06
KLX 15A	415.00	420.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	440.00	445.00	0	0	4.26E-10									7.82E-10	0	1	5.00E-10	3.00E-09
KLX 15A	445.00	450.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	450.00	455.00	0	0	2.30E-09									1.20E-08	0	1	8.00E-09	4.00E-08
KLX 15A	455.00	460.00	0	0	1.08E-09									2.90E-09	0	1	7.00E-10	6.00E-09
KLX 15A	460.00	465.00	0	0	4.00E-10									5.36E-09	0	1	2.00E-09	8.00E-09
KLX 15A	465.00	470.00	0	0	2.98E-10									2.93E-09	0	1	1.00E-09	5.00E-09
KLX 15A	470.00	475.00	0	0	2.54E-10									1.20E-09	0	1	8.00E-10	3.00E-09
KLX 15A	475.00	480.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	500.00	505.00	0	0	2.54E-08									2.30E-07	0	1	9.00E-08	6.00E-07
KLX 15A	505.00	510.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	510.00	515.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	515.00	520.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	620.00	625.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	623.00	628.00	0	0	3.62E-10									1.92E-09	0	1	1.00E-09	1.00E-08
KLX 15A	628.00	633.00	0	0	1.50E-07									3.40E-07	0	1	1.00E-07	2.00E-06
KLX 15A	630.00	635.00	0	0	1.56E-07									3.30E-07	0	1	2.00E-07	3.00E-06
KLX 15A	635.00	640.00	0	0	1.54E-10									1.70E-09	0	1	4.00E-10	3.00E-09
KLX 15A	660.00	665.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	665.00	670.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	670.00	675.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	675.00	680.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	700.00	705.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	705.00	710.00	0	0	2.04E-09									1.42E-08	0	1	4.00E-09	3.00E-08
KLX 15A	710.00	715.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	715.00	720.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	720.00	725.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	725.00	730.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	730.00	735.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	735.00	740.00	0	0	1.34E-09									3.57E-09	0	1	1.00E-09	1.00E-08
KLX 15A	745.00	750.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	750.00	755.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	755.00	760.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	760.00	765.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	770.00	775.00	0	0	9.80E-10									2.57E-09	0	1	7.00E-10	6.00E-09
KLX 15A	775.00	780.00	0	0	5.10E-10									6.80E-09	0	1	2.00E-09	9.00E-09
KLX 15A	785.00	790.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	790.00	795.00	0	0	6.26E-10									2.19E-09	0	1	5.00E-10	5.00E-09
KLX 15A	795.00	800.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	800.00	805.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	805.00	810.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	810.00	815.00	0	0	6.74E-10									4.92E-09	0	1	1.00E-09	8.00E-09
KLX 15A	815.00	820.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	840.00	845.00	0	0	1.65E-10									1.67E-09	0	1	4.00E-10	5.00E-09
KLX 15A	845.00	850.00	0	0	1.13E-09									2.40E-08	0	1	6.00E-09	7.00E-08
KLX 15A	850.00	855.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	855.00	860.00	0	0	1.35E-09									1.43E-08	0	1	4.00E-09	3.00E-08
KLX 15A	860.00	865.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	865.00	870.00	0	0	1.94E-10									4.40E-09	0	1	8.00E-10	7.00E-09
KLX 15A	870.00	875.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	875.00	880.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 15A	970.00	1000.43	0	0	7.28E-09									8.26E-08	0	1	4.00E-08	3.00E-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 15A	405.00	410.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	410.00	415.00	1.00E-06	1.00E-06		77.05	0								2.61E-11	2.9E-03	12.5	66.6	1109.4
KLX 15A	415.00	420.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	440.00	445.00	1.00E-06	1.00E-06		13.09	0								2.55E-11	2.8E-03	-1.7	109.8	934.8
KLX 15A	445.00	450.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	450.00	455.00	1.00E-06	1.00E-06		26.01	0								2.02E-11	2.2E-03	0.4	144.6	1123.8
KLX 15A	455.00	460.00	1.00E-06	1.00E-06		8.00	-1								1.88E-11	2.1E-03	-1.4	73.2	232.8
KLX 15A	460.00	465.00	1.00E-06	1.00E-06		21.17	0								1.41E-11	1.6E-03	8.2	529.8	1131.6
KLX 15A	465.00	470.00	1.00E-06	1.00E-06		18.21	0								1.76E-11	1.9E-03	5.4	739.2	2110.8
KLX 15A	470.00	475.00	1.00E-06	1.00E-06		14.56	0								1.58E-11	1.7E-03	0.9	#NV	#NV
KLX 15A	475.00	480.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	500.00	505.00	1.00E-06	1.00E-06		54.19	0								1.55E-11	1.7E-03	2.8	53.4	969.6
KLX 15A	505.00	510.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	510.00	515.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	515.00	520.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	620.00	625.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	623.00	628.00	1.00E-06	1.00E-06		16.38	0								1.93E-11	2.1E-03	1.0	78.60	895.80
KLX 15A	628.00	633.00	1.00E-06	1.00E-06		22.68	-1								2.16E-10	2.4E-02	-4.0	55.20	172.80
KLX 15A	630.00	635.00	1.00E-06	1.00E-06		20.69	-1								2.77E-10	3.1E-02	-4.1	78.00	145.80
KLX 15A	635.00	640.00	1.00E-06	1.00E-06		15.89	-1								2.20E-11	2.4E-03	8.0	#NV	#NV
KLX 15A	660.00	665.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	665.00	670.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	670.00	675.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	675.00	680.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	700.00	705.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	705.00	710.00	1.00E-06	1.00E-06		10.34	1								1.38E-10	1.5E-02	-3.1	45.00	175.80
KLX 15A	710.00	715.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	715.00	720.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	720.00	725.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	725.00	730.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	730.00	735.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	735.00	740.00	1.00E-06	1.00E-06		6.49	1								5.22E-12	5.8E-04	-2.6	41.40	138.00
KLX 15A	745.00	750.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	750.00	755.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	755.00	760.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	760.00	765.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	770.00	775.00	1.00E-06	1.00E-06		17.62	0								1.02E-11	1.1E-03	-1.8	88.80	900.60
KLX 15A	775.00	780.00	1.00E-06	1.00E-06		13.47	1								1.81E-11	2.0E-03	5.4	220.80	431.40
KLX 15A	785.00	790.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	790.00	795.00	1.00E-06	1.00E-06		8.84	1								6.49E-11	7.2E-03	-2.1	93.60	327.00
KLX 15A	795.00	800.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	800.00	805.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	805.00	810.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	810.00	815.00	1.00E-06	1.00E-06		6.60	1								1.39E-11	1.5E-03	-0.2	49.80	121.80
KLX 15A	815.00	820.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	840.00	845.00	1.00E-06	1.00E-06		15.82	-1								2.63E-11	2.9E-03	5.2	#NV	#NV
KLX 15A	845.00	850.00	1.00E-06	1.00E-06		30.80	-1								1.23E-11	1.4E-03	16.0	#NV	#NV
KLX 15A	850.00	855.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	855.00	860.00	1.00E-06	1.00E-06		8.85	1								1.27E-11	1.4E-03	3.3	45.00	128.40
KLX 15A	860.00	865.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	865.00	870.00	1.00E-06	1.00E-06		34.91	-1								1.97E-11	2.2E-03	15.7	#NV	#NV
KLX 15A	870.00	875.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	875.00	880.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 15A	970.00	1000.43	1.00E-06	1.00E-06		18.55	1								6.89E-11	7.6E-03	7.4	84.00	234.60

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 15A	405.00	410.00					#NV													
KLX 15A	410.00	415.00					3178.6													
KLX 15A	415.00	420.00					#NV													
KLX 15A	440.00	445.00					3405.1													
KLX 15A	445.00	450.00					#NV													
KLX 15A	450.00	455.00					3481.8													
KLX 15A	455.00	460.00					#NV													
KLX 15A	460.00	465.00					3554.5													
KLX 15A	465.00	470.00					3589.7													
KLX 15A	470.00	475.00					3629.9													
KLX 15A	475.00	480.00					#NV													
KLX 15A	500.00	505.00					3847.9													
KLX 15A	505.00	510.00					#NV													
KLX 15A	510.00	515.00					#NV													
KLX 15A	515.00	520.00					#NV													
KLX 15A	620.00	625.00					#NV													
KLX 15A	623.00	628.00					4759.4													
KLX 15A	628.00	633.00					4793.4													
KLX 15A	630.00	635.00					4806.1													
KLX 15A	635.00	640.00					4852.9													
KLX 15A	660.00	665.00					#NV													
KLX 15A	665.00	670.00					#NV													
KLX 15A	670.00	675.00					#NV													
KLX 15A	675.00	680.00					#NV													
KLX 15A	700.00	705.00					#NV													
KLX 15A	705.00	710.00					#NV													
KLX 15A	710.00	715.00					#NV													
KLX 15A	715.00	720.00					#NV													
KLX 15A	720.00	725.00					#NV													
KLX 15A	725.00	730.00					#NV													
KLX 15A	730.00	735.00					#NV													
KLX 15A	735.00	740.00					5585.8													
KLX 15A	745.00	750.00					#NV													
KLX 15A	750.00	755.00					#NV													
KLX 15A	755.00	760.00					#NV													
KLX 15A	760.00	765.00					#NV													
KLX 15A	770.00	775.00					5843.5													
KLX 15A	775.00	780.00					5909.7													
KLX 15A	785.00	790.00					#NV													
KLX 15A	790.00	795.00					6009.0													
KLX 15A	795.00	800.00					#NV													
KLX 15A	800.00	805.00					#NV													
KLX 15A	805.00	810.00					#NV													
KLX 15A	810.00	815.00					6137.8													
KLX 15A	815.00	820.00					#NV													
KLX 15A	840.00	845.00					6411.2													
KLX 15A	845.00	850.00					6391.7													
KLX 15A	850.00	855.00					#NV													
KLX 15A	855.00	860.00					6447.4													
KLX 15A	860.00	865.00					#NV													
KLX 15A	865.00	870.00					6546.8													
KLX 15A	870.00	875.00					#NV													
KLX 15A	875.00	880.00					#NV													
KLX 15A	970.00	1000.43					7289.6													

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 15A	2007-04-12 07:48:00	2007-04-12 10:08:00	80.00	180.00		181.00	1000.43	630	631	633	1447	1449	1450	
KLX 15A	2007-04-12 13:56:00	2007-04-12 16:07:00	180.00	280.00		281.00	1000.43	1391	1391	1392	2203	2203	2203	
KLX 15A	2007-04-12 17:54:00	2007-04-12 20:31:00	280.00	380.00		381.00	1000.43	2148	2148	2148	2953	2953	2953	
KLX 15A	2007-04-12 22:07:00	2007-04-12 23:57:00	380.00	480.00		481.00	1000.43	2900	2899	2900	3698	3698	3699	
KLX 15A	2007-04-13 06:20:00	2007-04-13 08:19:00	480.00	580.00		581.00	1000.43	3650	3650	3650	4442	4442	4443	
KLX 15A	2007-04-13 10:28:00	2007-04-13 12:19:00	580.00	680.00		681.00	1000.43	4395	4395	4395	5184	5184	5184	
KLX 15A	2007-04-13 15:02:00	2007-04-13 17:27:00	680.00	780.00		781.00	1000.43	5136	5136	5136	5913	5913	5913	
KLX 15A	2007-04-13 19:23:00	2007-04-13 21:53:00	780.00	880.00		881.00	1000.43	5867	5866	5866	6630	6630	6630	
KLX 15A	2007-04-14 19:23:00	2007-04-14 20:46:00	80.00	100.00		101.00	1000.43	635	634	635	842	842	842	
KLX 15A	2007-04-14 22:09:00	2007-04-14 23:32:00	100.00	120.00		121.00	1000.43	785	786	786	993	995	993	
KLX 15A	2007-04-15 00:09:00	2007-04-15 01:31:00	120.00	140.00		141.00	1000.43	937	939	940	1146	1149	1148	
KLX 15A	2007-04-15 07:52:00	2007-04-15 09:21:00	140.00	160.00		161.00	1000.43	1089	1090	1089	1298	1298	1298	
KLX 15A	2007-04-15 10:15:00	2007-04-15 11:42:00	160.00	180.00		181.00	1000.43	1241	1241	1241	1450	1450	1450	
KLX 15A	2007-04-15 12:35:00	2007-04-15 14:01:00	180.00	200.00		201.00	1000.43	1393	1394	1394	1601	1602	1602	
KLX 15A	2007-04-15 14:59:00	2007-04-15 16:43:00	200.00	220.00		221.00	1000.43	1546	1546	1546	1754	1754	1754	
KLX 15A	2007-04-15 17:16:00	2007-04-15 19:09:00	220.00	240.00		241.00	1000.43	1697	1697	1697	1904	1904	1904	
KLX 15A	2007-04-15 19:47:00	2007-04-15 22:15:00	240.00	260.00		261.00	1000.43	1848	1848	1846	2054	2054	2053	
KLX 15A	2007-04-15 22:53:00	2007-04-16 00:21:00	260.00	280.00		281.00	1000.43	1997	1997	1997	2204	2204	2204	
KLX 15A	2007-04-16 00:56:00	2007-04-16 04:49:00	280.00	300.00		301.00	1000.43	2148	2148	2148	2354	2354	2354	
KLX 15A	2007-04-16 06:46:00	2007-04-16 07:39:00	300.00	320.00		321.00	1000.43	2298	2298	2298	2503	2504	2503	
KLX 15A	2007-04-16 11:08:00	2007-04-16 11:57:00	340.00	360.00		361.00	1000.43	2600	2600	2600	2804	2804	2804	
KLX 15A	2007-04-16 13:33:00	2007-04-16 15:03:00	360.00	380.00		381.00	1000.43	2751	2751	2751	2955	2955	2955	
KLX 15A	2007-04-16 15:49:00	2007-04-16 17:16:00	380.00	400.00		401.00	1000.43	2903	2903	2903	3106	3113	3107	
KLX 15A	2007-04-16 17:49:00	2007-04-16 19:13:00	400.00	420.00		421.00	1000.43	3054	3054	3054	3257	3257	3257	
KLX 15A	2007-04-16 19:51:00	2007-04-16 20:47:00	420.00	440.00		441.00	1000.43	3204	3204	3204	3406	3406	3406	
KLX 15A	2007-04-16 22:04:00	2007-04-16 23:37:00	440.00	460.00		461.00	1000.43	3353	3352	3352	3553	3553	3553	
KLX 15A	2007-04-17 00:11:00	2007-04-17 05:32:00	460.00	480.00		481.00	1000.43	3500	3499	3499	3700	3700	3699	
KLX 15A	2007-04-17 06:50:00	2007-04-17 07:38:00	480.00	500.00		501.00	1000.43	3648	3648	3649	3848	3848	3848	
KLX 15A	2007-04-17 08:22:00	2007-04-17 09:52:00	500.00	520.00		521.00	1000.43	3798	3798	3798	3997	3998	3998	
KLX 15A	2007-04-17 10:40:00	2007-04-17 11:29:00	520.00	540.00		541.00	1000.43	3947	3947	3947	4144	4144	4145	
KLX 15A	2007-04-17 13:13:00	2007-04-17 14:02:00	540.00	560.00		561.00	1000.43	4096	4096	4096	4293	4293	4293	
KLX 15A	2007-04-17 14:39:00	2007-04-17 15:28:00	560.00	580.00		581.00	1000.43	4245	4245	4245	4441	4441	4442	
KLX 15A	2007-04-17 17:01:00	2007-04-17 17:56:00	580.00	600.00		601.00	1000.43	4395	4395	4395	4589	4589	4590	
KLX 15A	2007-04-17 18:29:00	2007-04-17 19:23:00	600.00	620.00		621.00	1000.43	4543	4543	4542	4737	4737	4737	
KLX 15A	2007-04-17 19:54:00	2007-04-17 21:59:00	620.00	640.00		641.00	1000.43	4690	4689	4688	4888	4888	4888	
KLX 15A	2007-04-18 06:55:00	2007-04-18 07:46:00	680.00	700.00		701.00	1000.43	5131	5131	5131	5327	5327	5328	
KLX 15A	2007-04-18 08:32:00	2007-04-18 10:34:00	700.00	720.00		721.00	1000.43	5278	5278	5278	5474	5474	5475	
KLX 15A	2007-04-18 11:25:00	2007-04-18 13:21:00	720.00	740.00		741.00	1000.43	5426	5425	5426	5619	5620	5620	
KLX 15A	2007-04-18 14:06:00	2007-04-18 16:13:00	740.00	760.00		761.00	1000.43	5572	5572	5572	5765	5765	5765	
KLX 15A	2007-04-18 16:45:00	2007-04-18 18:35:00	760.00	780.00		781.00	1000.43	5718	5718	5718	5910	5910	5910	
KLX 15A	2007-04-18 19:14:00	2007-04-18 22:09:00	780.00	800.00		801.00	1000.43	5867	5865	5867	6057	6058	6059	
KLX 15A	2007-04-18 23:25:00	2007-04-19 01:11:00	800.00	820.00		821.00	1000.43	6012	6012	6012	6203	6203	6202	
KLX 15A	2007-04-19 01:51:00	2007-04-19 02:43:00	820.00	840.00		841.00	1000.43	6156	6156	6156	6345	6345	6345	
KLX 15A	2007-04-19 07:59:00	2007-04-19 09:31:00	840.00	860.00		861.00	1000.43	6300	6299	6298	6489	6488	6488	
KLX 15A	2007-04-19 10:19:00	2007-04-19 13:12:00	860.00	880.00		881.00	1000.43	6444	6444	6445	6629	6629	6629	
KLX 15A	2007-04-19 14:46:00	2007-04-19 15:34:00	880.00	900.00		901.00	1000.43	6590	6590	6590	6772	6772	6772	
KLX 15A	2007-04-19 16:30:00	2007-04-19 17:21:00	900.00	920.00		921.00	1000.43	6733	6733	6733	6915	6915	6917	
KLX 15A	2007-04-19 17:52:00	2007-04-19 18:22:00	920.00	940.00		941.00	1000.43	6879	6879	6879	7060	7060	7061	
KLX 15A	2007-04-19 20:42:00	2007-04-19 21:31:00	940.00	960.00		961.00	1000.43	7024	7024	7024	7204	7204	7204	
KLX 15A	2007-04-19 22:03:00	2007-04-19 22:53:00	955.00	975.00		976.00	1000.43	7132	7132	7132	7311	7311	7310	
KLX 15A	2007-04-21 12:18:00	2007-04-21 14:33:00	380.00	385.00		386.00	1000.43	2901	2901	2901	2992	2992	2992	
KLX 15A	2007-04-21 15:06:00	2007-04-21 16:31:00	385.00	390.00		391.00	1000.43	2939	2939	2939	3030	3035	3030	
KLX 15A	2007-04-21 16:56:00	2007-04-21 18:20:00	390.00	395.00		396.00	1000.43	2976	2976	2976	3068	3072	3068	
KLX 15A	2007-04-21 21:08:00	2007-04-21 22:31:00	400.00	405.00		406.00	1000.43	3051	3051	3052	3142	3144	3143	

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 15A	2007-04-21 22:58:00	2007-04-21 23:47:00	405.00	410.00		411.00	1000.43	3089	3089	3089	3180	3180	3180	
KLX 15A	2007-04-22 00:11:00	2007-04-22 01:33:00	410.00	415.00		416.00	1000.43	3126	3127	3126	3218	3218	3218	
KLX 15A	2007-04-22 06:38:00	2007-04-22 07:26:00	415.00	420.00		421.00	1000.43	3163	3163	3163	3256	3256	3256	
KLX 15A	2007-04-22 08:18:00	2007-04-22 10:14:00	440.00	445.00		446.00	1000.43	3351	3351	3351	3442	3442	3442	
KLX 15A	2007-04-22 10:48:00	2007-04-22 11:37:00	445.00	450.00		451.00	1000.43	3388	3388	3388	3479	3479	3479	
KLX 15A	2007-04-22 13:05:00	2007-04-22 14:33:00	450.00	455.00		456.00	1000.43	3425	3425	3424	3515	3515	3515	
KLX 15A	2007-04-22 15:03:00	2007-04-22 16:45:00	455.00	460.00		461.00	1000.43	3462	3462	3462	3552	3552	3552	
KLX 15A	2007-04-22 17:10:00	2007-04-22 18:37:00	460.00	465.00		466.00	1000.43	3499	3499	3499	3589	3588	3589	
KLX 15A	2007-04-22 19:02:00	2007-04-22 20:50:00	465.00	470.00		471.00	1000.43	3537	3537	3537	3627	3626	3627	
KLX 15A	2007-04-22 21:41:00	2007-04-22 23:12:00	470.00	475.00		476.00	1000.43	3575	3575	3575	3665	3665	3665	
KLX 15A	2007-04-22 23:36:00	2007-04-23 00:24:00	475.00	480.00		481.00	1000.43	3613	3613	3613	3702	3702	3702	
KLX 15A	2007-04-23 00:58:00	2007-04-23 02:17:00	500.00	505.00		506.00	1000.43	3799	3799	3798	3889	3889	3889	
KLX 15A	2007-04-23 06:34:00	2007-04-23 07:23:00	505.00	510.00		511.00	1000.43	3835	3835	3834	3924	3924	3924	
KLX 15A	2007-04-23 07:57:00	2007-04-23 08:45:00	510.00	515.00		516.00	1000.43	3871	3871	3871	3961	3961	3961	
KLX 15A	2007-04-23 09:17:00	2007-04-23 10:05:00	515.00	520.00		521.00	1000.43	3909	3909	3909	3998	3998	3998	
KLX 15A	2007-04-23 13:19:00	2007-04-23 14:08:00	620.00	625.00		626.00	1000.43	4688	4688	4688	4773	4773	4773	
KLX 15A	2007-04-23 14:31:00	2007-04-23 16:01:00	623.00	628.00		629.00	1000.43	4711	4711	4711	4795	4795	4795	
KLX 15A	2007-04-23 16:25:00	2007-04-23 17:57:00	628.00	633.00		634.00	1000.43	4747	4746	4746	4835	4836	4836	
KLX 15A	2007-04-23 18:21:00	2007-04-23 19:41:00	630.00	635.00		636.00	1000.43	4761	4760	4761	4849	4849	4849	
KLX 15A	2007-04-23 20:25:00	2007-04-23 22:02:00	635.00	640.00		641.00	1000.43	4798	4798	4798	4886	4886	4886	
KLX 15A	2007-04-23 22:41:00	2007-04-23 23:30:00	660.00	665.00		666.00	1000.43	4982	4982	4982	5070	5070	5070	
KLX 15A	2007-04-23 23:55:00	2007-04-24 01:02:00	665.00	670.00		671.00	1000.43	5019	5019	5019	5107	5107	5107	
KLX 15A	2007-04-24 01:07:00	2007-04-24 01:55:00	670.00	675.00		676.00	1000.43	5056	5056	5056	5143	5143	5144	
KLX 15A	2007-04-24 06:35:00	2007-04-24 07:25:00	675.00	680.00		681.00	1000.43	5092	5092	5091	5179	5179	5179	
KLX 15A	2007-04-24 08:09:00	2007-04-24 08:58:00	700.00	705.00		706.00	1000.43	5277	5277	5277	5364	5364	5364	
KLX 15A	2007-04-24 09:27:00	2007-04-24 12:06:00	705.00	710.00		711.00	1000.43	5315	5315	5316	5401	5401	5402	
KLX 15A	2007-04-24 12:23:00	2007-04-24 13:15:00	710.00	715.00		716.00	1000.43	5353	5353	5353	5439	5439	5439	
KLX 15A	2007-04-24 13:42:00	2007-04-24 14:31:00	715.00	720.00		721.00	1000.43	5390	5390	5390	5475	5475	5475	
KLX 15A	2007-04-24 15:00:00	2007-04-24 15:49:00	720.00	725.00		726.00	1000.43	5427	5427	5427	5511	5511	5512	
KLX 15A	2007-04-24 16:16:00	2007-04-24 17:04:00	725.00	730.00		731.00	1000.43	5464	5464	5464	5548	5548	5548	
KLX 15A	2007-04-24 17:29:00	2007-04-24 18:18:00	730.00	735.00		736.00	1000.43	5500	5500	5500	5584	5584	5584	
KLX 15A	2007-04-24 18:46:00	2007-04-24 20:38:00	735.00	740.00		741.00	1000.43	5536	5536	5536	5620	5621	5620	
KLX 15A	2007-04-24 23:35:00	2007-04-25 00:24:00	745.00	750.00		751.00	1000.43	5608	5608	5608	5692	5692	5692	
KLX 15A	2007-04-25 00:48:00	2007-04-25 01:37:00	750.00	755.00		756.00	1000.43	5645	5645	5645	5728	5728	5729	
KLX 15A	2007-04-25 06:31:00	2007-04-25 07:20:00	755.00	760.00		761.00	1000.43	5681	5681	5682	5764	5764	5764	
KLX 15A	2007-04-25 07:45:00	2007-04-25 08:33:00	760.00	765.00		766.00	1000.43	5718	5718	5719	5801	5801	5801	
KLX 15A	2007-04-25 13:20:00	2007-04-25 17:15:00	770.00	775.00		776.00	1000.43	5794	5794	5795	5876	5877	5876	
KLX 15A	2007-04-25 17:38:00	2007-04-25 19:01:00	775.00	780.00		781.00	1000.43	5831	5831	5831	5913	5913	5913	
KLX 15A	2007-04-25 21:31:00	2007-04-25 22:19:00	785.00	790.00		791.00	1000.43	5902	5902	5901	5983	5983	5983	
KLX 15A	2007-04-25 22:42:00	2007-04-26 00:12:00	790.00	795.00		796.00	1000.43	5937	5937	5937	6018	6018	6018	
KLX 15A	2007-04-26 00:40:00	2007-04-26 01:26:00	795.00	800.00		801.00	1000.43	5974	5974	5974	6055	6055	6055	
KLX 15A	2007-04-26 06:31:00	2007-04-26 07:20:00	800.00	805.00		806.00	1000.43	6009	6009	6009	6089	6089	6089	
KLX 15A	2007-04-26 12:24:00	2007-04-26 13:13:00	805.00	810.00		811.00	1000.43	6047	6047	6047	6126	6126	6127	
KLX 15A	2007-04-26 13:40:00	2007-04-26 15:11:00	810.00	815.00		816.00	1000.43	6085	6085	6085	6163	6163	6164	
KLX 15A	2007-04-26 15:35:00	2007-04-26 16:24:00	815.00	820.00		821.00	1000.43	6122	6122	6123	6203	6203	6202	
KLX 15A	2007-04-26 17:00:00	2007-04-26 18:41:00	840.00	845.00		846.00	1000.43	6304	6304	6305	6382	6382	6382	
KLX 15A	2007-04-26 19:05:00	2007-04-26 20:28:00	845.00	850.00		851.00	1000.43	6341	6339	6340	6418	6418	6418	
KLX 15A	2007-04-26 21:12:00	2007-04-26 22:01:00	850.00	855.00		856.00	1000.43	6376	6376	6375	6453	6453	6452	
KLX 15A	2007-04-26 22:24:00	2007-04-26 23:47:00	855.00	860.00		861.00	1000.43	6412	6412	6411	6489	6489	6489	
KLX 15A	2007-04-27 00:09:00	2007-04-27 01:16:00	860.00	865.00		866.00	1000.43	6448	6448	6447	6525	6525	6525	
KLX 15A	2007-04-27 01:20:00	2007-04-27 03:30:00	865.00	870.00		871.00	1000.43	6483	6483	6483	6559	6559	6559	
KLX 15A	2007-04-27 06:28:00	2007-04-27 07:17:00	870.00	875.00		876.00	1000.43	6517	6517	6517	6593	6593	6593	
KLX 15A	2007-04-27 07:43:00	2007-04-27 08:23:00	875.00	880.00		881.00	1000.43	6554	6554	6555	6631	6631	6631	
KLX 15A	2007-04-28 10:58:00	2007-04-28 13:52:00	970.00	1000.43		1001.43	1000.43	7238	7239	7239	#NV	#NV	#NV	

APPENDIX 5-2

SICADA data tables (Pulse injection tests)

(Simplified version v1.8)

SICADA/Data Import Template

SKB & Ergodata AB 2006

File Identity	
Created By	
Created	

File Time Zone

Compiled By	
Quality Check For Delivery	
Delivery Approval	

Activity Type	HY665 PLU Pulse Test

Project	PLU KLX 15A

Activity Information						Additional Activity Data						
						C30	C40	I160	P20	P200	P220	R240
Idcode	**Start Date**	**Stop Date**	**Secup (m)**	**Seclow (m)**	**Section No**	**Company evaluating data**	**Company performing field work**	**Instrument**	**Field crew manager**	**Field crew**	**Person evaluating data**	**Length calibration type**
KLX 15A	2007-04-16 08:19	2007-04-25 21:08	320.00	785.00		Golder Associates	Golder Associates	PSS 2	Stephan Rohs, Reinder van der Wall, Philipp Wolf	Linda Höckert, Eric Lövgren, Sascha Lenné, Thomas Cronquist	Reinder van der Wall, Philipp Wolf, Stephan Rohs	

Table	plu_slug_test_ed Slug- & pulse test, calculated and evaluated results		
Column	**Datatype**	**Unit**	**Column Description**
site	CHAR		Investigation site name
idcode	CHAR		Object or borehole identification code
secup	FLOAT	m	
seclow	FLOAT	m	Lower section limit (m)
start_date	DATE		Date (yymmdd hh:mm:ss)
stop_date	DATE		Date (yymmdd hh:mm:ss)
activity_type	CHAR		Activity type code
sign	CHAR		Activity QA signature
error_flag	CHAR		*: Data for the activity is erroneous and should not be used
test_type	CHAR		Type of test, one of 7, see table description
formation_type	CHAR		1: Rock, 2: Soil (superficial deposits)
start_flow_period	DATE		Date and time of flow phase start (YYYYMMDD hhmmss)
dur_flow_phase_tp	FLOAT	s	Time for the flowing phase of the test (tp)
dur_rec_phase_tf	FLOAT	s	Time for the recovery phase of the test (tF)
initial_head_h0	FLOAT	m	Initial formation hydraulic head, see table description
initial_displacem_dh0	FLOAT	m	Initial displacement of hydraulic head,see table description
displacem_dh0_p	FLOAT	m	Initial displacement of slugtest,see table description
displacem_dh0_f	FLOAT	m	Initial displacement of bailtest,see table description
head_at_flow_end_hp	FLOAT	m	Hydraulic head at end of flow phase,see table description
final_head_hf	FLOAT	m	Hydraulic head at the end of the recovery,see table descr.
initial_press_pi	FLOAT	kPa	Initial formation pressure
initial_press_diff_dp0	FLOAT	kPa	Initial pressure change from pi at time dt=0,pulse test
press_change_dp0_p	FLOAT	kPa	Initial pressure change;pulse test-measured
press_at_flow_end_pp	FLOAT	kPa	Final pressure at the end of the flowing period
final_press_pf	FLOAT	kPa	Final pressure at the end of the recovery period
formation_width_b	FLOAT	m	b:Interpreted formation thickness repr. for evaluated T,see
transmissivity_ts	FLOAT	m**2/s	Ts: Transmissivity based on slugtest, see table description
value_type_ts	CHAR		0:true value,-1:Ts<lower meas.limit,1:Ts>upper meas.limit
bc_ts	CHAR		Best choice code.1 means Ts is best choice of transm.,else 0
transmissivity_tp	FLOAT	m**2/s	TP: Transmissivity based on pulse test, see table descript.
value_type_tp	CHAR		0:true value,-1:Tp<lower meas.limit,1:Tp>upper meas.limit
bc_tp	CHAR		Best choice code.1 means Tp is best choice of transm.,else 0
l_meas_limit_t	FLOAT	m**2	Estimated lower measurement limit for Ts orTp,see descript.
u_meas_limit_t	FLOAT	m**2	Estimated upper measurement limit for Ts & Tp, see descript.
storativity_s	FLOAT		S= Storativity, see table description
assumed_s	FLOAT		S*=assumed storativity, see table description
skin	FLOAT		Skin factor
assumed_skin	FLOAT		Asumed skin factor
c	FLOAT	m**3/pa	Well bore storage coefficient
fluid_temp_tew	FLOAT	oC	Fluid temperature in the test section, see table description
fluid_elcond_ecw	FLOAT	mS/m	Fluid electric conductivity in test section,see table descri
fluid_salinity_tdsw	FLOAT	mg/l	Total salinity of the test section fluid (EC), see descr.
fluid_salinity_tdswm	FLOAT	mg/l	Total salinity of the test section fluid (samples),see descr
dt1	FLOAT	s	Estimated start time of evaluation, see table description
dt2	FLOAT	s	Estimated stop time of evaluation, see table description
reference	CHAR		SKB report No for reports describing data and evaluation
comments	CHAR		Short comment to evaluated parameters

			(m)	(m)					(s)	(s)	(m)	(m)	(m)	(m)	(m)	(m)	(kPa)	(kPa)
idcode	start_date	stop_date	secup	seclow	section_no	test_type	formation_type	start_flow_period	dur_flow_phase_tp	dur_rec_phase_tf	initial_head_h0	initial_displacem_dh0	displacem_dh0_p	displacem_dh0_f	ow_end_hp	final_head_hf	initial_press_pi	initial_press_diff_dp0
KLX 15A	2007-04-16 08:19:00	2007-04-16 10:26:00	320.00	340.00		4B	1	2007-04-16 09:03:43	10	18000							2620	211
KLX 15A	2007-04-17 22:57:00	2007-04-17 23:59:00	640.00	660.00		4B	1	2007-04-17 23:36:57	10	#NV							#NV	#NV
KLX 15A	2007-04-18 00:38:00	2007-04-18 05:25:00	660.00	680.00		4B	1	2007-04-17 01:23:46	10	4560							5146	227
KLX 15A	2007-04-21 18:45:00	2007-04-21 20:28:00	395.00	400.00		4B	1	2007-04-21 19:26:26	10	1680							3091	196
KLX 15A	2007-04-24 21:17:00	2007-04-24 23:09:00	740.00	745.00		4B	1	2007-04-24 22:05:42	10	3600							5618	209
KLX 15A	2007-04-25 09:00:00	2007-04-25 10:53:00	765.00	770.00		4B	1	2007-04-25 09:49:03	10	1620							5825	202
KLX 15A	2007-04-25 19:31:00	2007-04-25 21:08:00	780.00	785.00		4B	1	2007-04-25 20:06:01	10	#NV							#NV	#NV

	(m)	(m)	(kPa)	(kPa)	(kPa)	(m)	(m**2/s)			(m**2/s)			(m**2)	(m**2)					(m**3/pa)	(oC)	(mS/m)	(mg/l)	(mg/l)	(s)	(s)		
idcode	secup	seclow	hange_dp0_p	press_at_flow_end_pp	final_press_pf	formation_width_b	transmissivity_ts	value_type_ts	bc_ts	transmissivity_tp	value_type_tp	bc_tp	l_meas_limit_t	u_meas_limit_t	storativity_s	assumed_s	skin	assumed_skin	c	fluid_temp_tew	ond_ecw	inity_tdsw	nity_tdswm	dt1	dt2	reference	comments
KLX 15A	320.00	340.00		2831	2631					4.35E-10	0	1	1.00E-10	8.00E-10	1.00E-06	1.00E-06	-0.6		4.50E-11	10.7				88.80	517.80		
KLX 15A	640.00	660.00		#NV	#NV					1.00E-11	-1	1	1.00E-11	1.00E-13	1.00E-06	1.00E-06	#NV		#NV	14.4				#NV	#NV		
KLX 15A	660.00	680.00		5373	5342					3.89E-10	0	1	1.00E-12	8.00E-10	1.00E-06	1.00E-06	-1.8		5.07E-11	14.6				#NV	#NV		
KLX 15A	395.00	400.00		3287	3106					3.48E-11	0	1	1.00E-11	8.00E-11	1.00E-06	1.00E-06	-0.5		1.65E-11	11.3				545.40	3323.40		
KLX 15A	740.00	745.00		5827	5633					1.76E-10	0	1	6.00E-11	3.00E-10	1.00E-06	1.00E-06	-0.9		1.27E-11	#NV				#NV	#NV		
KLX 15A	765.00	770.00		6027	5831					2.47E-10	0	1	8.00E-11	5.00E-10	1.00E-06	1.00E-06	-1.0		2.05E-11	#NV				#NV	#NV		
KLX 15A	780.00	785.00		#NV	#NV					1.00E-11	-1	1	1.00E-11	1.00E-13	1.00E-06	1.00E-06	#NV		#NV	#NV				#NV	#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)
sign	CHAR		Activity QA signature
error_flag	CHAR		*: Data for the activity is erroneous and should not be used
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 (m)	seclow (m)	section_no	obs_secup (m)	obs_seclow (m)	pi_above (kPa)	pp_above (kPa)	pf_above (kPa)	pi_below (kPa)	pp_below (kPa)	pf_below (kPa)	comments
KLX 15A	2007-04-16 08:19:00	2007-04-16 10:26:00	320.00	340.00		341.00	1000.43	2448	2449	2449	2654	2654	2654	
KLX 15A	2007-04-17 22:57:00	2007-04-17 23:59:00	640.00	660.00		661.00	1000.43	4835	4835	4835	5034	5033	5033	
KLX 15A	2007-04-18 00:38:00	2007-04-18 05:25:00	660.00	680.00		681.00	1000.43	4983	4983	4983	5180	5180	5182	
KLX 15A	2007-04-21 18:45:00	2007-04-21 20:28:00	395.00	400.00		401.00	1000.43	3013	3013	3013	3105	3105	3105	
KLX 15A	2007-04-24 21:17:00	2007-04-24 23:09:00	740.00	745.00		746.00	1000.43	5571	5571	5571	5656	5656	5656	
KLX 15A	2007-04-25 09:00:00	2007-04-25 10:53:00	765.00	770.00		771.00	1000.43	5756	5756	5756	5838	5838	5838	
KLX 15A	2007-04-25 19:31:00	2007-04-25 21:08:00	780.00	785.00		786.00	1000.43	5868	5868	5866	5948	5948	5948	