P-06-225

Oskarshamn site investigation

Hydraulic injection tests in borehole KLX18A

Subarea Laxemar

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Golder Associates GmbH

October 2006

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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 KLX18A at the Laxemar area, Oskarshamn. The tests are part of the general program for site investigations and specifically for the Laxemar sub-area. The hydraulic testing programme has the aim to characterise the rock with respect to its hydraulic properties of the fractured zones and rock mass between them. Data is subsequently delivered for the site descriptive model.

This report describes the results and primary data evaluation of the hydraulic injection tests in borehole KLX18A performed between 13th of August and 26th of August 2006.

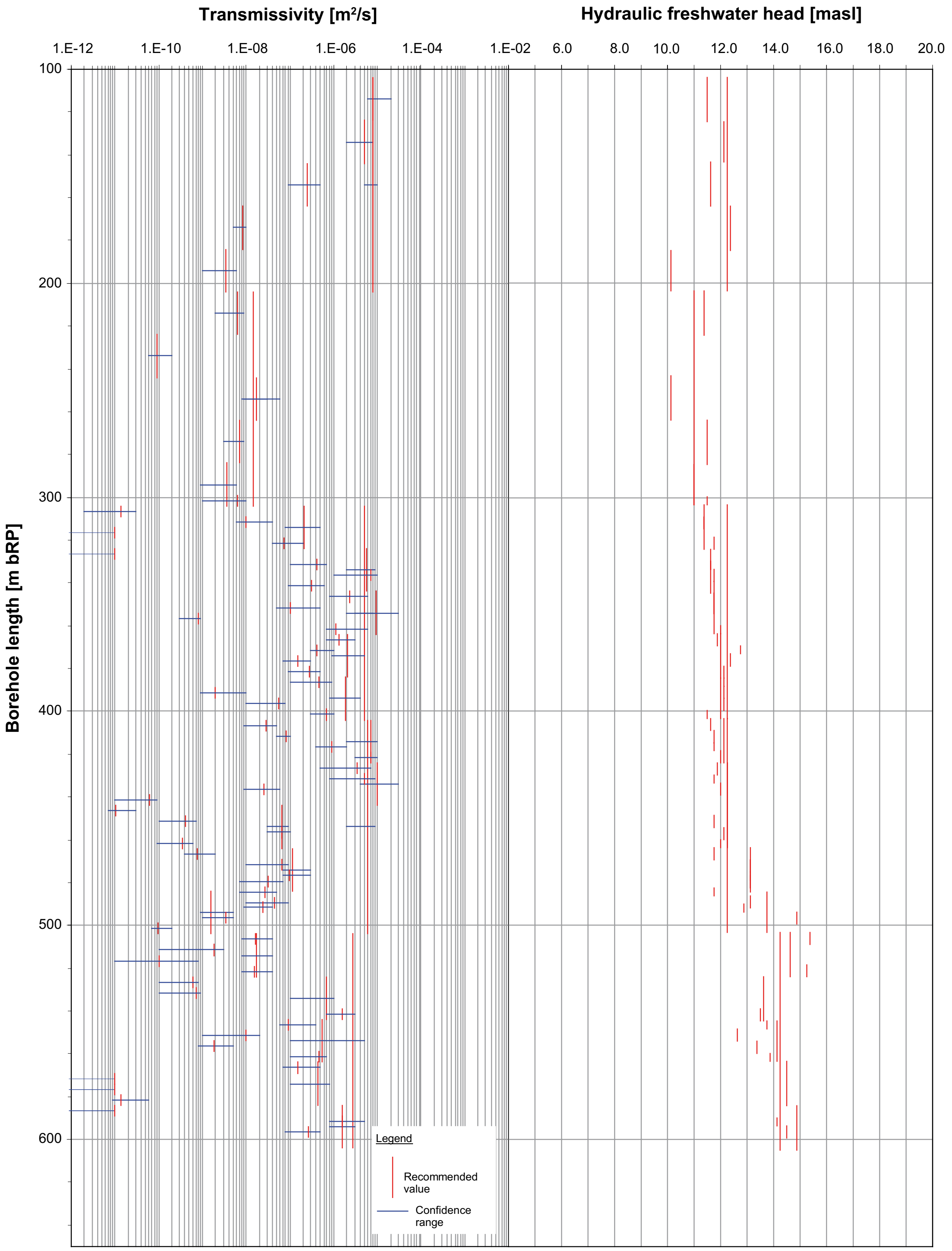
The objective of the hydrotests was to describe the rock around the borehole with respect of hydraulic parameters, mainly transmissivity (T) and hydraulic conductivity (K) at different measurement scales of 100 m, 20 m and 5 m sections. Transient evaluation during flow and recovery period provided additional information such as flow regimes, hydraulic boundaries and cross-over flows. Constant pressure injection tests were conducted between 104.00–604.00 m below ToC. The results of the test interpretation are presented as transmissivity, hydraulic conductivity and hydraulic freshwater head.

Sammanfattning

Injektionstester har utförts i borrhål KLX18A i delområde Laxemar, Oskarshamn. Testerna är en del av SKB:s platsundersökningar. Hydraultestprogrammet där injektionstesterna ingår har som mål att karakterisera berget med avseende på dess hydrauliska egenskaper av sprickzoner och mellanliggande bergmassa. Data från testerna används vid den platsbeskrivande modelleringen av området.

Denna rapport redovisar resultaten och utvärderingar av primärdata de hydrauliska injektionstesterna i borrhål KLX18A. Testerna utfördes mellan den 13 augusti till den 26 augusti 2006.

Syftet med hydraultesterna var framförallt att beskriva bergets hydrauliska egenskaper runt borrhålet med avseende på hydrauliska parametrar, i huvudsak transmissvitet (T) och hydraulisk konduktivitet (K) vid olika mätskalor av 100 m, 20 m och 5 m sektioner. Transient utvärdering under injektions- och återhämntningsfasen gav ytterligare information avseende flödesgeometri, hydrauliska gränser och sprickläckage. Injektionstester utfördes mellan 104,00–604,00 m borrhålslängd. Resultaten av testutvärderingen presenteras som transmissivitet, hydraulisk konduktivitet och grundvattennivå uttryckt i ekvivalent sötvattenpelare (freshwater head).



Borehole KLX18A – 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 in borehole KLX18A during 13th of August and 26th of August 2006 following the methodology described in SKB MD 323.001 and in the activity plan AP PS 400-06-93 (SKB internal 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 KLX18A. The commission was conducted by Golder Associates AB and Golder Associates GmbH.

Borehole KLX18A is situated in the Laxemar area approximately 2 km west of the nuclear power plant of Simpevarp, Figure 1-1. The borehole was drilled from February 2006 to May 2006 at 611.28 m length with an inner diameter of 76 mm and an inclination of –82.04°. The upper 11.83 m is cased with large diameter telescopic casing ranging from diameter (outer diameter) 208–323 mm.

The work was carried out in accordance with activity plan AP PS 400-06-93. In Table 1-1 controlling documents for performing this activity are listed. Both activity plan and method descriptions are SKB's internal controlling documents. Measurements were conducted utilising SKB's custom made testing equipment PSS.

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

Activity plan	Number	Version
Hydraulic injection tests in borehole KLX18A	AP PS 400-06-93	1.0
Method descriptions	**Number**	**Version**
Hydraulic injection tests	SKB MD 323.001	1.0
Instruktion för rengöring av borrhålsutrustning och viss mark-baserad utrustning	SKB MD 600.004	1.0
Instruktion för längdkalibrering vid undersökningar i kärnborrhål	SKB MD 620.010	1.0
Allmänna ordning-, skydds- och miljöregler för plats-undersökningar Oskarshamn	SKB SDPO-003	1.0
Miljökontrollprogram Platsundersökningar	SKB SDP-301	1.0
Hantering av primärdata vid platsundersökningar	SKB SDP-508	1.0
Mätssystembeskrivning PSS	SKB MD 345.101–123	1.0

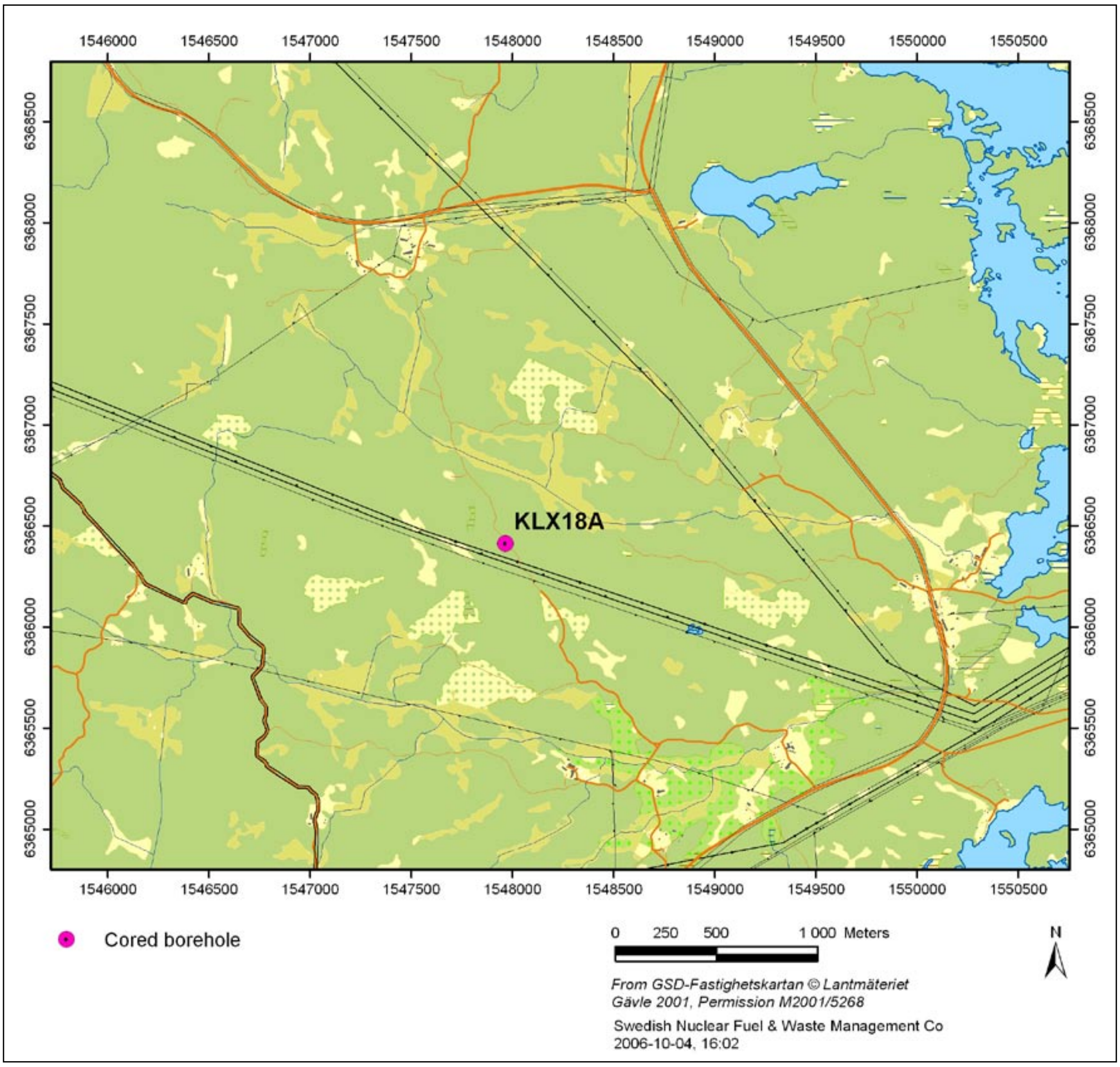


Figure 1-1. *The investigation area Laxemar, Oskarshamn with location of borehole KLX18A.*

2 Objective

The objective of the hydrotests in borehole KLX18A is to describe the rock around the borehole with respect to hydraulic parameters, mainly transmissivity (T) and hydraulic conductivity (K). This is done at different measurement scales of 100 m, 20 m and 5 m sections. Among these parameters transient evaluation during the flow and recovery period provides additional information such as flow regimes, hydraulic boundaries and cross-over flows.

3 Scope of work

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

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

The following hydraulic injection tests were performed between 15th August and 26th August 2006.

3.1 Borehole

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

3.2 Injection tests

Injection tests were conducted according to the Activity Plan AP PS 400-06-093 and the method description for hydraulic injection tests, SKB MD 323.001 (SKB internal documents). Tests were done in 100 m test sections between 104.00–604.00 m below ToC, in 20 m test sections between 104.00–604.00 m below ToC and in 5 m test sections between 299.00–599.00 m below ToC (see Table 3-3). The initial criteria for performing injection tests in 20 m and 5 m test sections was a measurable flow of Q > 0.001 L/min in the previous measured 100 m tests covering the smaller test sections (see Figure 3-1). The measurements were performed with SKB's custom made equipment for hydraulic testing called PSS.

No other additional measurements except the actual hydraulic tests and related measurements of packer position and water level in annulus of borehole KLX18A were conducted.

Table 3-1. Performed injection tests at borehole KLX18A.

No. of injection tests	Interval	Positions	Time/test	Total test time
5	100 m	104.00–604.00 m	125 min	10.4 hrs
25	20 m	104.00–604.00 m	90 min	37.5 hrs
61	5 m	299.00–599.00 m	90 min	91.5
Total:				139.4 hrs

Table 3-2. Information about KLX18A (from SICADA 2006-07-13).

Title	Value				
Borehole length (m):	611.280				
Reference level:	TOC				
Drilling period(s):	From date	To date	Secup (m)	Seclow (m)	Drilling type
	2006-02-15	2006-02-21	0.300	99.930	Percussion drilling
	2006-03-29	2006-05-02	99.930	611.280	Core drilling
Starting point coordinate:	Length (m)	Northing (m)	Easting (m)	Elevation (masl)	Coord system
(centerpoint of TOC)	0.000	6366413.390	1547966.345	21.010	RT90-RHB70
	3.000	6366413.400	1547965.930	18.038	RT90-RHB70
Angles:	Length (m)	Bearing	Inclination (– = down)		
	0.000	271.402	–82.040		RT90-RHB70
Borehole diameter:	Secup (m)	Seclow (m)	Hole diam (m)		
	0.300	9.300	0.340		
	9.300	11.830	0.254		
	11.830	99.830	0.198		
	99.830	99.930	0.163		
	99.930	101.350	0.086		
	101.350	611.280	0.076		
Core diameter:	Secup (m)	Seclow (m)	Core diam (m)		
	99.930	100.800	0.072		
	100.800	611.280	0.050		
Casing diameter:	Secup (m)	Seclow (m)	Case in (m)	Case out (m)	
	0.000	11.800	0.200	0.208	
	0.000	8.900	0.310	0.323	
Cone dimensions:	Secup (m)	Seclow (m)	Cone in (m)	Cone out (m)	
	96.530	101.350			
Grove milling:	Length (m)	Trace detectable			
	110.000	YES			
	150.000	YES			
	200.000	YES			
	250.000	YES			
	300.000	YES			
	350.000	YES			
	400.000	YES			
	450.000	YES			
	500.000	YES			
	550.000	YES			
	602.000	YES			

Table 3-3. Tests performed.

Bh ID	Test section (m bToC)	Test type[1]	Test no	Test start Date, time	Test stop Date, time
KLX18A	104.00–204.00	3	1	060815 10:44	060815 12:10
KLX18A	204.00–304.00	3	1	060815 14:05	060815 16:10
KLX18A	304.00–404.00	3	1	060815 17:25	060815 19:19
KLX18A	404.00–504.00	3	1	060815 21:08	060815 23:01
KLX18A	504.00–604.00	3	1	060816 07:34	060816 09:40
KLX18A	104.00–124.00	3	1	060816 19:58	060816 21:22
KLX18A	124.00–144.00	3	1	060816 22:02	060816 23:27
KLX18A	144.00–164.00	3	1	060816 23:59	060817 01:27
KLX18A	164.00–184.00	3	1	060817 06:38	060817 08:23
KLX18A	184.00–204.00	3	1	060817 09:06	060817 10:48
KLX18A	204.00–224.00	3	1	060817 11:27	060817 13:32
KLX18A	224.00–244.00	4B	1	060817 14:08	060817 16:08
KLX18A	244.00–264.00	3	1	060817 16:43	060817 18:16
KLX18A	264.00–284.00	3	1	060817 18:46	060817 20:28
KLX18A	284.00–304.00	3	1	060817 21:22	060817 23:01
KLX18A	304.00–324.00	3	1	060817 23:30	060818 00:54
KLX18A	324.00–344.00	3	1	060818 01:24	060818 02:47
KLX18A	344.00–364.00	3	1	060818 06:29	060818 08:03
KLX18A	364.00–384.00	3	1	060818 08:34	060818 10:01
KLX18A	384.00–404.00	3	1	060818 10:38	060818 12:07
KLX18A	404.00–424.00	3	1	060818 13:16	060818 14:45
KLX18A	424.00–444.00	3	1	060818 15:16	060818 16:46
KLX18A	444.00–464.00	3	1	060818 17:20	060818 18:44
KLX18A	464.00–484.00	3	1	060818 19:19	060818 20:35
KLX18A	484.00–504.00	3	1	060818 21:19	060818 21:55
KLX18A	484.00–504.00	3	2	060818 22:51	060819 00:27
KLX18A	484.00–504.00	3	3	060819 00:45	060819 04:09
KLX18A	504.00–524.00	3	1	060819 06:24	060819 08:12
KLX18A	524.00–544.00	3	1	060819 08:45	060819 10:16
KLX18A	544.00–564.00	3	1	060819 10:56	060819 12:36
KLX18A	564.00–584.00	3	1	060819 13:29	060819 14:56
KLX18A	584.00–604.00	3	1	060819 15:30	060819 16:51
KLX18A	299.00–304.00	3	1	060820 08:53	060820 10:28
KLX18A	304.00–309.00	4B	1	060820 10:58	060820 12:56
KLX18A	309.00–314.00	3	1	060820 13:33	060820 15:04
KLX18A	314.00–319.00	4B	1	060820 15:29	060820 16:27
KLX18A	319.00–324.00	3	1	060820 16:52	060820 18:12
KLX18A	324.00–329.00	4B	1	060820 18:35	060820 19:31
KLX18A	329.00–334.00	3	1	060820 19:53	060820 21:14
KLX18A	334.00–339.00	3	1	060820 21:58	060820 23:46
KLX18A	339.00–344.00	3	1	060821 00:08	060821 01:31
KLX18A	344.00–349.00	3	1	060821 01:55	060821 03:24
KLX18A	349.00–354.00	3	1	060821 06:23	060821 08:08
KLX18A	354.00–359.00	4B	1	060821 08:44	060821 10:08
KLX18A	359.00–364.00	3	1	060821 10:37	060821 12:02
KLX18A	364.00–369.00	3	1	060821 13:02	060821 14:22
KLX18A	369.00–374.00	3	1	060821 15:02	060821 16:20

Bh ID	Test section (m bToC)	Test type[1]	Test no	Test start Date, time	Test stop Date, time
KLX18A	374.00–379.00	3	1	060821 16:42	060821 18:05
KLX18A	379.00–384.00	3	1	060821 18:28	060821 19:48
KLX18A	384.00–389.00	3	1	060821 20:20	060821 21:41
KLX18A	389.00–394.00	3	1	060821 22:03	060821 23:33
KLX18A	394.00–399.00	3	1	060821 23:59	060822 01:29
KLX18A	399.00–404.00	3	1	060822 06:19	060822 07:37
KLX18A	404.00–409.00	3	1	060822 08:10	060822 09:32
KLX18A	409.00–414.00	3	1	060822 10:09	060822 11:36
KLX18A	414.00–419.00	3	1	060822 12:56	060822 14:04
KLX18A	414.00–419.00	3	2	060822 14:07	060822 15:25
KLX18A	419.00–424.00	3	1	060822 15:59	060822 17:19
KLX18A	424.00–429.00	3	1	060822 17:42	060822 19:08
KLX18A	429.00–434.00	3	1	060822 19:32	060822 20:54
KLX18A	434.00–439.00	3	1	060822 21:24	060822 22:46
KLX18A	439.00–444.00	4B	1	060822 23:10	060823 00:35
KLX18A	444.00–449.00	4B	1	060823 01:02	060823 03:40
KLX18A	449.00–454.00	3	1	060823 06:23	060823 08:04
KLX18A	454.00–459.00	3	1	060823 08:37	060823 10:04
KLX18A	459.00–464.00	3	1	060823 10:41	060823 12:04
KLX18A	464.00–469.00	3	1	060823 13:31	060823 15:05
KLX18A	469.00–474.00	3	1	060823 16:36	060823 17:54
KLX18A	474.00–479.00	3	1	060823 18:19	060823 19:37
KLX18A	477.00–482.00	3	1	060823 20:08	060823 21:32
KLX18A	482.00–487.00	3	1	060823 21:55	060823 23:32
KLX18A	487.00–492.00	3	1	060823 23:55	060823 01:21
KLX18A	389.00–494.00	3	1	060824 06:23	060824 07:59
KLX18A	494.00–499.00	3	1	060824 08:48	060824 10:28
KLX18A	499.00–504.00	4B	1	060824 11:04	060824 12:08
KLX18A	504.00–509.00	3	1	060824 14:09	060824 16:21
KLX18A	509.00–514.00	4B	1	060824 16:44	060824 17:40
KLX18A	514.00–519.00	3	1	060824 18:02	060824 18:57
KLX18A	519.00–524.00	3	1	060824 19:21	060824 20:43
KLX18A	524.00–529.00	4B	1	060824 21:09	060824 22:14
KLX18A	529.00–534.00	4B	1	060824 22:37	060824 23:43
KLX18A	534.00–539.00	3	1	060825 00:07	060825 01:32
KLX18A	539.00–544.00	3	1	060825 06:09	060825 07:44
KLX18A	544.00–549.00	3	1	060825 08:29	060825 09:59
KLX18A	549.00–554.00	3	1	060825 10:32	060825 12:27
KLX18A	554.00–559.00	3	1	060825 13:24	060825 15:03
KLX18A	559.00–564.00	3	1	060825 15:36	060825 16:54
KLX18A	564.00–569.00	3	1	060825 17:19	060825 18:40
KLX18A	569.00–574.00	4B	1	060825 19:04	060825 21:13
KLX18A	574.00–579.00	3	1	060825 21:36	060825 22:15
KLX18A	579.00–584.00	4B	1	060825 22:38	060825 23:58
KLX18A	584.00–589.00	3	1	060826 00:20	060826 01:08
KLX18A	589.00–594.00	3	1	060826 06:16	060826 07:46
KLX18A	594.00–599.00	3	1	060826 08:29	060826 09:53

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

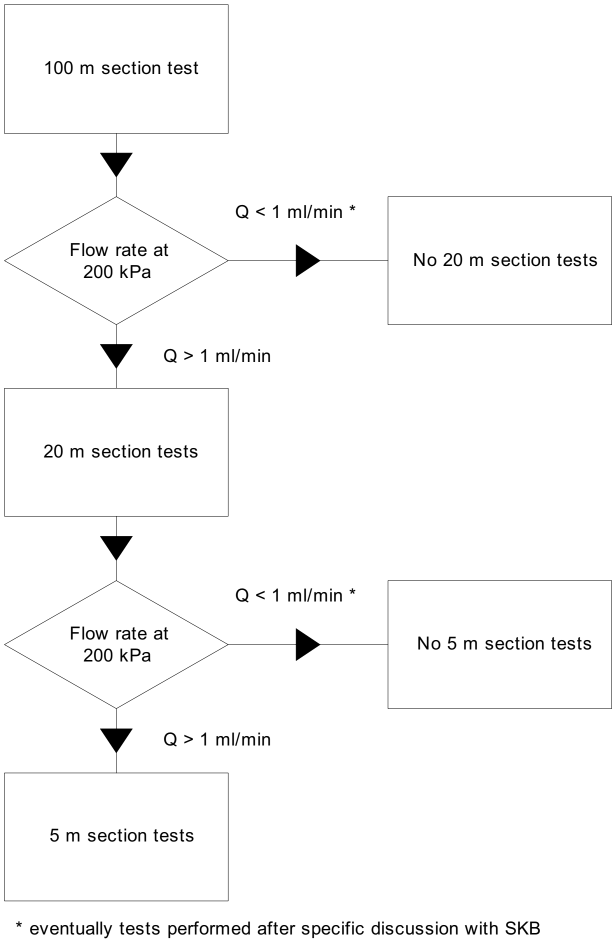


Figure 3-1. *Flow chart for test sections.*

3.3 Control of equipment

Control of equipment was mainly performed according to Golder's 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 PSS tool.

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

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

4 Equipment

4.1 Description of equipment

The equipment called PSS (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 PSS 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.

PSS is documented in photographs 1–6.

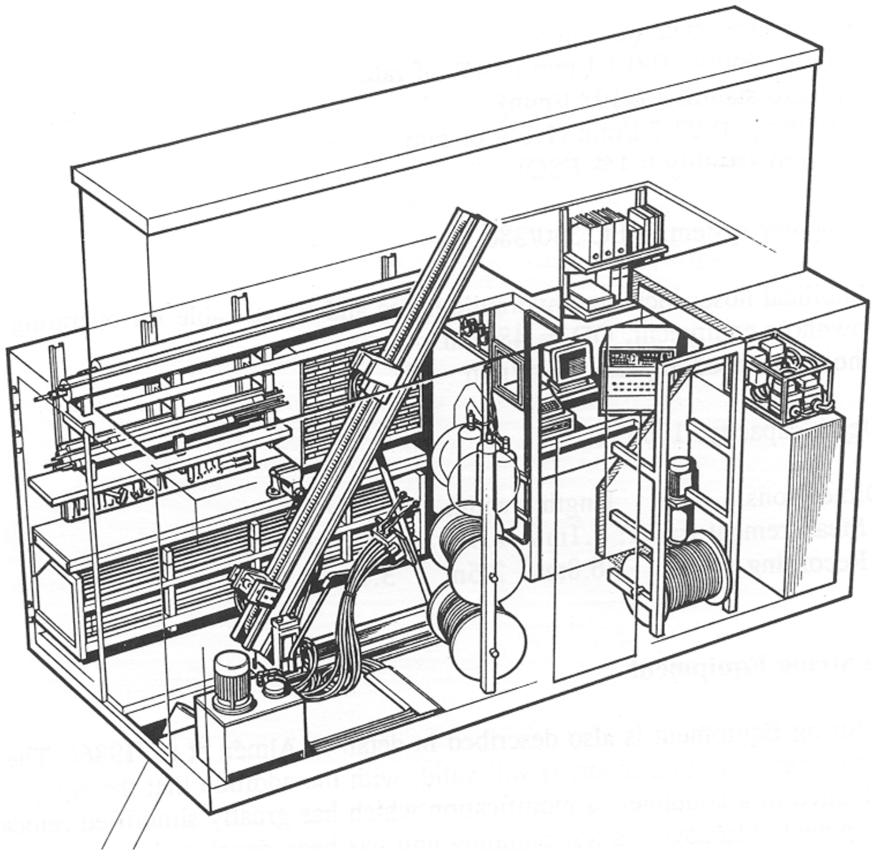


Figure 4-1. *A view of the layout and equipment of PSS.*

Photo 1. *Hydraulic rig.*

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

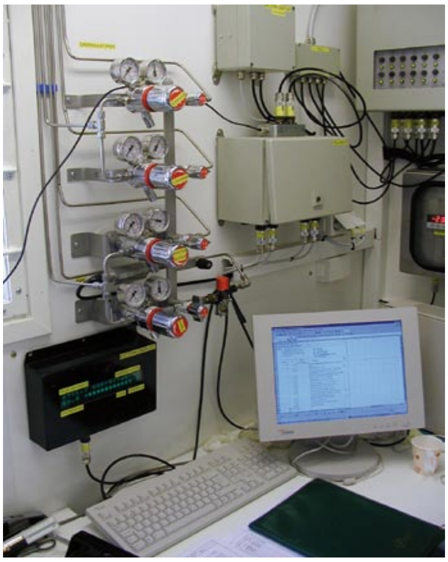


Photo 3. *Computer room, displays and gas regulators.*

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 3kPa/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 3kPa/m at 50 L/min.
- Contact carrier – SS 1,0 m carrying connections for sensors below and,
- Upper packer – SS and PUR 1.5 m with OD 72 mm, fixed ends, seal length 1.0 m, maximum pressure 6.5 MPa, working pressure 1.6 MPa
- Breakpin – SS 250 mm with OD 33.7 mm. Maximum load of 47.3 (± 1.0) kN.
- Gauge carrier – SS 1.5 m carrying top section pressure transducer, connections from sensors below. Flow pipe is double bent at both ends to give room for sensor equipment. The pipe gauge carrier is covered by split pipes.
- Shut-in tool (test valve) – SS 1.0 m with a OD of 48 mm, Teflon coated valve piston, friction loss of 11 kPa at 10 L/min (260 kPa-50 L/min). Working pressure 2.8–4.0 MPa. Breakpipe with maximum load of 47.3 (± 1.0) kN. The shut-in tool is covered by split pipes and connected to a stone catcher on the top.

The tool scheme is presented in Figure 4-2.

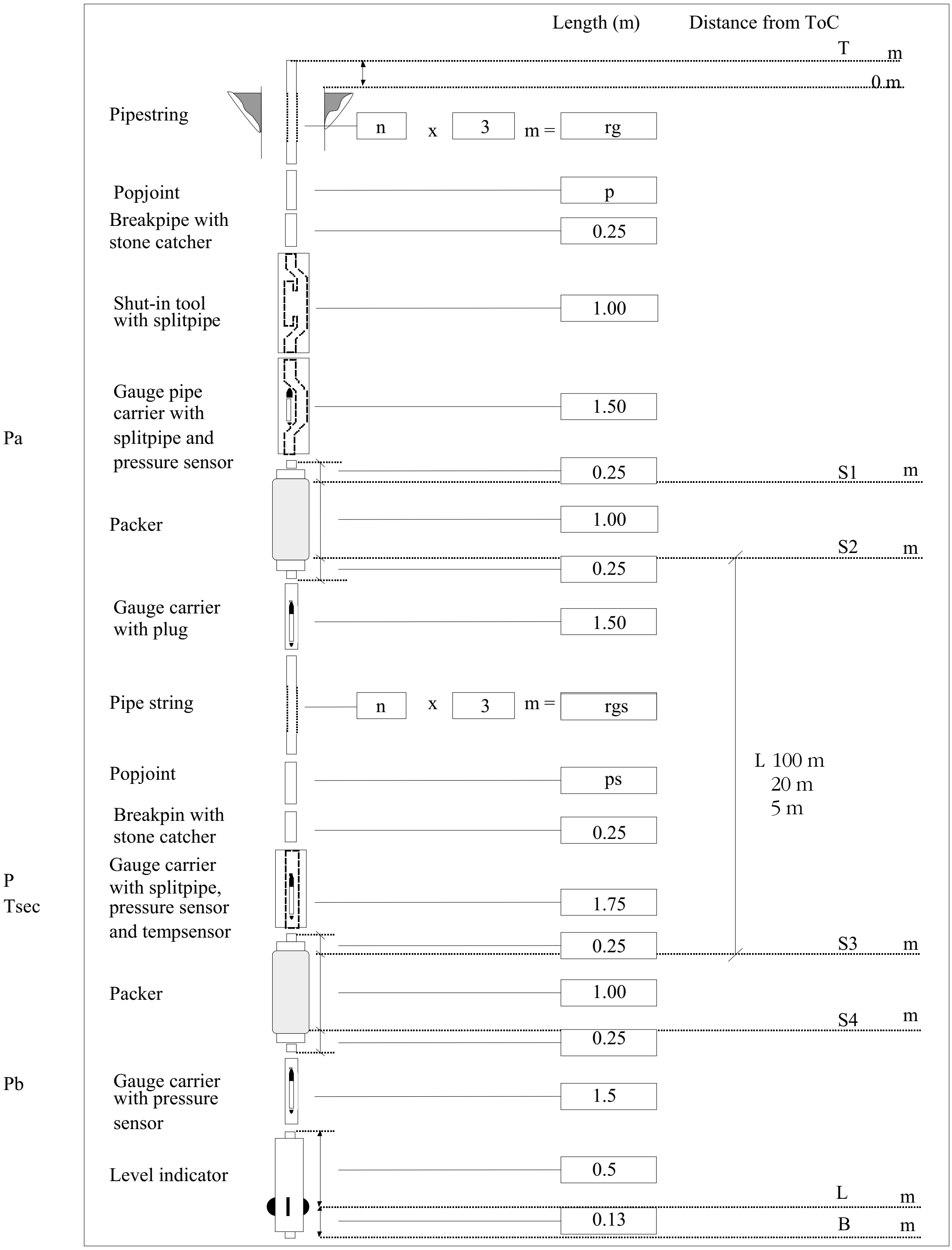


Figure 4-2. *Schematic drawing of the down-hole equipment in the PSS system.*

4.1 Sensors

Table 4-1. Technical specifications of sensors.

Keyword	Sensor	Name	Value/Range	Unit	Comments
$P_{sec,a,b}$	Pressure	Druck PTX 162-1464abs	9–30 4–20 0–13,5 ± 0,1	VDC mA MPa % of FS	
$T_{sec,surf,air}$	Temperature	BGI	18–24 4–20 0–32 ± 0,1	VDC A °C °C	
Q_{big}	Flow	Micro motion Elite sensor	0–100 ± 0,1	kg/min %	Massflow
Q_{small}	Flow	Micro motion Elite sensor	0–1,8 ± 0,1	kg/min %	Massflow
p_{air}	Pressure	Druck PTX 630	9–30 4–20 0–120 ± 0,1	VDC mA KPa % of FS	
p_{pack}	Pressure	Druck PTX 630	9–30 4–20 0–4 ± 0,1	VDC mA MPa % of FS	
$p_{in,out}$	Pressure	Druck PTX 1400	9–28 4–20 0–2,5 ± 0,15	VDC mA MPa % of FS	
L	Level Indicator				Length correction

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

Borehole information			Sensors		Equipment affecting WBS coefficient		
ID	Test section (m)	Volume in test section (m^3)	Type	Position (m fr ToC)	Position	Function	Outer diameter (mm)
KLX18A	104.00–204.00	0.454	p_a p T p_b L	102.11 203.37 203.20 206.01 206.25	Test section	Signal cable Pump string Packer line	9.1 33 6
KLX18A	104.00–124.00	0.091	p_a p T p_b L	102.11 123.37 123.20 126.01 126.25	Test section	Signal cable Pump string Packer line	9.1 33 6
KLX18A	299.00–304.00	0.023	p_a p T p_b L	297.11 303.37 303.20 306.01 306.25	Test section	Signal cable Pump string Packer line	9.1 33 6

4.4 Data acquisition system

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

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

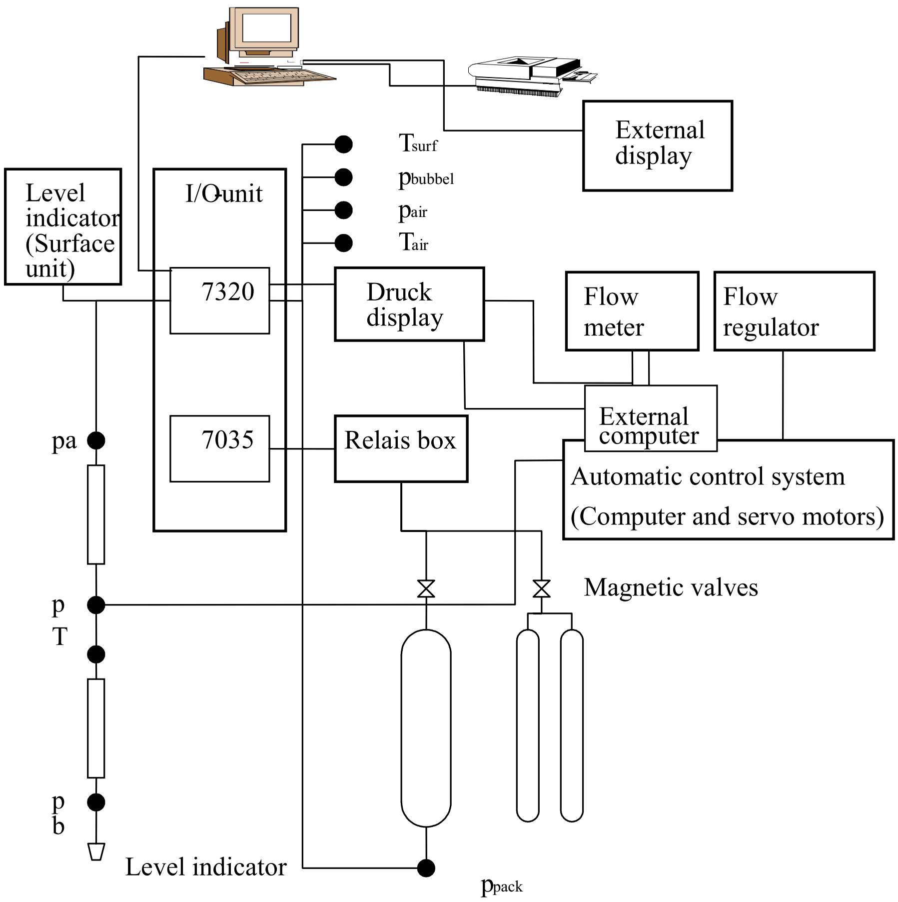


Figure 4-3. Schematic drawing of the data acquisition system and the flow regulation control system in PSS.

5 Execution

5.1 Preparations

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

- Place pallets and container, lifting rig up, installing fence on top of container, lifting tent on container.
- Clean and desinfect of Multikabel and hoses for packer and test valve. Clean the tubings with hot steam.
- Filling 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.

5.2 Length correction

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

5.3 Execution of tests/measurements

5.3.1 Test principle

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

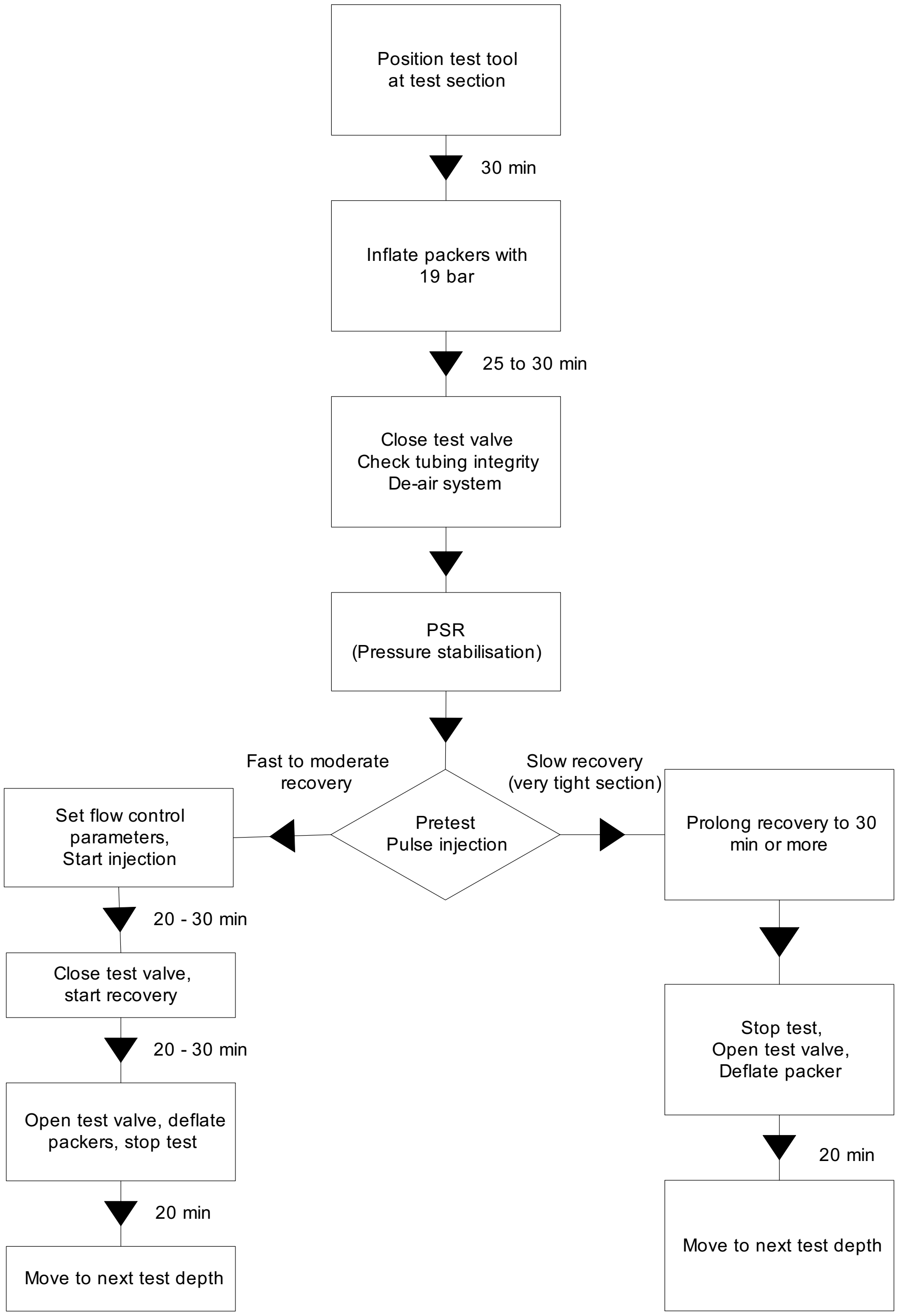


Figure 5-1. *Flow chart for test performance.*

5.3.2 Test procedure

A 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 tests 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 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 5-1.

5.4 Data handling

The data handling followed several stages. The data acquisition software (Orchestrator) produced an ASCII raw data file (*.ht2) which contains the data in voltage and milliampere format plus calibration coefficients. The *.ht2 files were processed to *.dat files using the SKB program called IPPlot. These files contain the time, pressure, flow rate and temperature data.

Table 5-1. 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 45 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.

The *.dat files were synthesised in Excel to a *.xls file for plotting purposes. Finally, the test data to be delivered to SKB were exported from Excel in *.csv format. These files were also used for the subsequent analysis (field and final) of the injection phase (CHi). The synthesised data of the recovery phase (CHir) was used for the field analysis and to receive preliminary results for concistency reviews.

5.5 Analyses and interpretation

5.5.1 Analysis software

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

5.5.2 Analysis approach

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

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.

5.5.3 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 alway 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 of 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 5-2 below show 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 5-3.

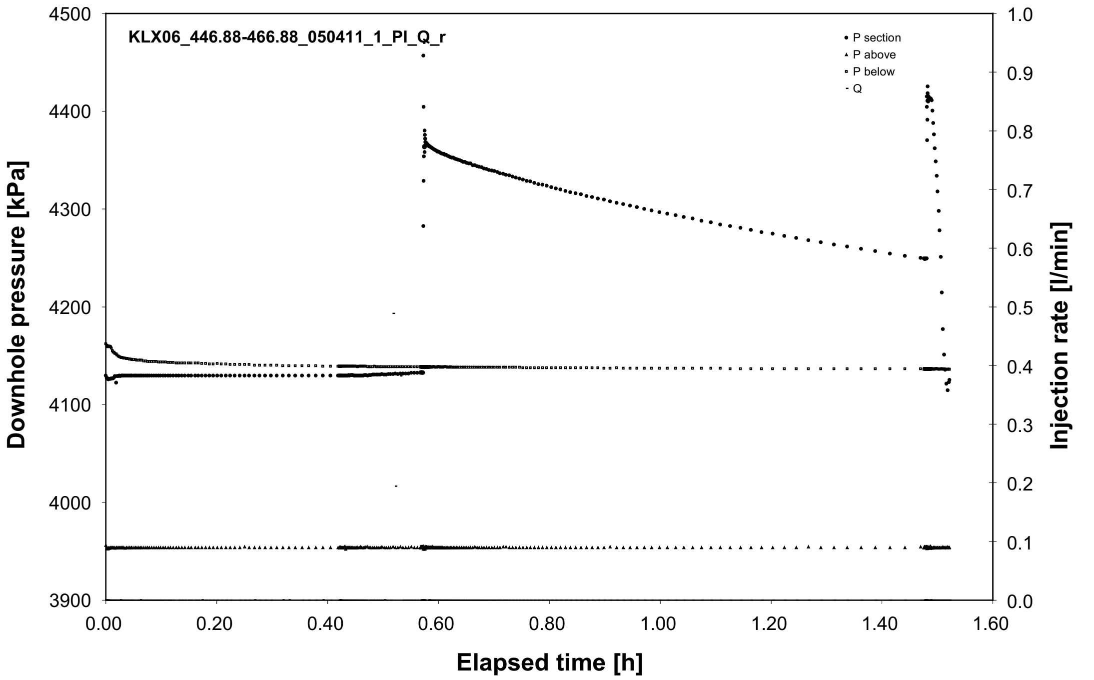


Figure 5-2. *Typical pressure versus time plot of a Pulse injection test.*

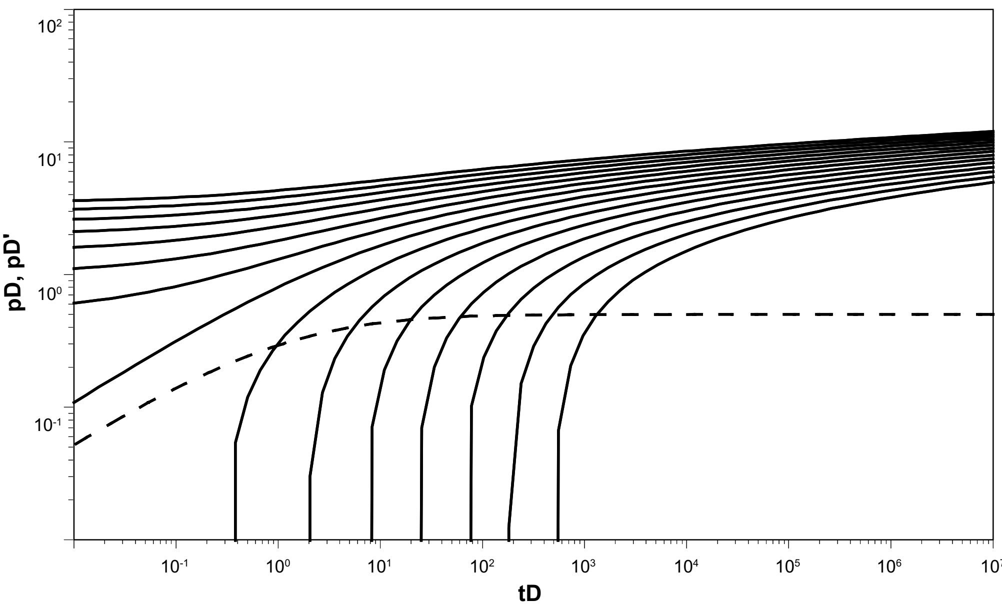


Figure 5-3. *Deconvolution type curve set for pulse test analysis.*

5.5.4 Correlation between storativity and skin factor

For the analysis of the conducted hydraulic tests below 100 m depth a storativity of $1\cdot10^{-6}$ 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^{2s}/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:

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

The equation above has two unknowns, the storativity (S) and the skin factor (s) 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.

5.5.5 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 5-4 presents the relationship between the shape of derivative and the ri-index.

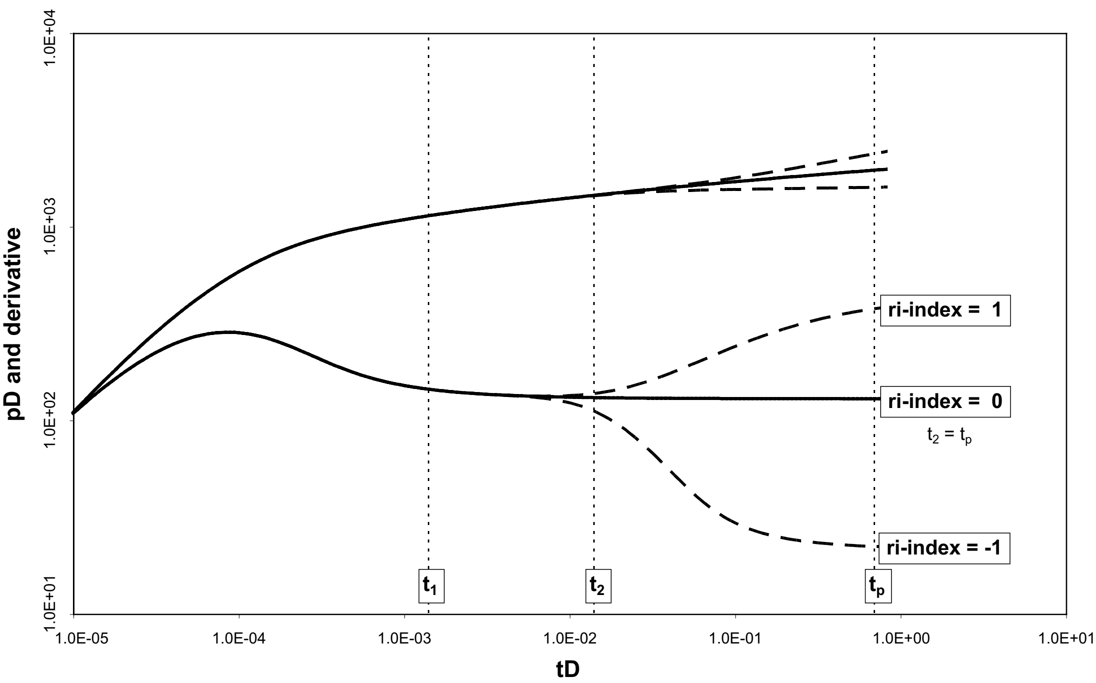


Figure 5-4. *Schematic plot of the assignments for the ri-indices.*

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/.

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 /Rhén et al. 2006/:

$S_T = 0.0007 * T_T^{0.5}$ [–]

5.5.6 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, we assume in general a radial flow regime 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.

5.5.7 Calculation of the static formation pressure and equivalent freshwater head

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

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

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

The equivalent freshwater head (expressed in meters above sea level) was calculated from the extrapolated static formation pressure (p*), corrected for athmospheric pressure measured by the surface gauge and corrected for the vertical depth considering the inclination of the drillhole, by assuming a water density of 1,000 kg/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 5-5 shows the methodology schematically.

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

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

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

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

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

5.5.8 Derivation of the recommended transmissivity and the confidence range

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

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

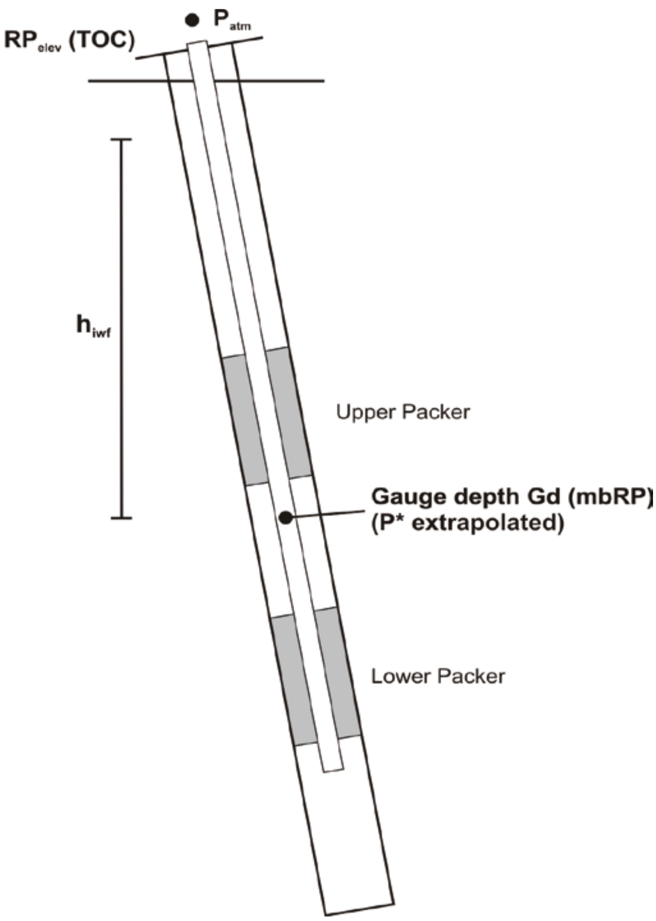


Figure 5-5. Schematic methodologies for calculation of the freshwater head.

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

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

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

5.6 Nonconformities

No nonconformities have been observed or reported.

6 Results

In the following, results of all tests are presented and analysed. Chapter 6.1 presents the 100 m tests, 6.2 the 20 m tests and 6.3 the 5 m tests. The results are given as general comments to test pereformance, the identified flow regimes 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 7-1 and 7-2 of the Synthesis chapter.

6.1 100 m single-hole injection tests

In the following, the 100 m section tests conducted in borehole KLX18A are presented and analysed.

6.1.1 Section 104.00–204.00 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 relative fast recovery of the pulse test indicated a relative high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 16.4 L/min at start of the CHi phase to 8.5 L/min at the end, indicating a relatively high interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

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 derivative at early times followed by a downward trend at middle times and a new stabilization at late times. This behaviour is indicative for an increase in transmissivity at some distance from the borehole. The response of the CHir phase is consistent to the response of the CHi phase. A two shell composite radial flow model was used for the analyses of both phases. The analysis is presented in Appendix 2-1.

Selected representative parameters

The recommended transmissivity of $7.8 \cdot 10^{-6}$ 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 $5.0 \cdot 10^{-6}$ m^2/s to $1.0 \cdot 10^{-5}$ 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 1,983.6 kPa.

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

6.1.2 Section 204.00–304.00 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 200 mL/min at start of the CHi phase to 80 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). 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 both phases show a downward trend at late times indicating a change in transmissivity at some distance from the borehole. Both phases were matched using a two shell composite radial flow model with increasing transmissivity away from the test section. The analysis is presented in Appendix 2-2.

Selected representative parameters

The recommended transmissivity of $1.5 \cdot 10^{-8}$ 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 $8.0 \cdot 10^{-9}$ 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 2,938.0 kPa.

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

6.1.3 Section 304.00–404.00 m, test no. 1, injection

Comments to test

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

The CHi phase was conducted using a pressure difference of 199 kPa. No connection between the test interval and the adjacent zones was observed. The injection rate decreased from 4.4 L/min at start of the CHi phase to 3.4 L/min at the end, indicating a high interval transmissivity (consistent with the pulse recovery). The Chi phase shows no problems and is adequate for quantitative analysis. The CHir phase recovers relatively fast but 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 relative flat derivative, which is indicative for radial flow (n=2). A homogenous flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a unit slope downward trend at middle times, indicating a large positive skin and a horizontal stabilization at late times. The CHir phase was matched 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 $5.1 \cdot 10^{-6}$ 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 $2.0 \cdot 10^{-6}$ 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 3,915.6 kPa.

The analysis of the CHi and CHir phases shows little inconsistency in the derived transmissivity from the two test phases. No further analysis is recommended.

6.1.4 Section 404.00–504.00 m, test no. 1, injection

Comments to test

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

The CHi phase was conducted using a pressure difference of 200 kPa. No hydraulic connection to the adjacent zones was observed. During the CHi phase the automatic regulation system functioned well. However, the recorded data is a little bit noisy. The injection rate decreased from 7.0 L/min at start of the CHi phase to 3.9 L/min at the end, indicating a relatively high interval transmissivity (consistent with the pulse recovery). The CHir phase recovers relatively fast. 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 (although noisy) is relatively flat, indicating a flow dimension of 2 (radial flow). A homogeneous radial flow model was used for the analysis of the CHi phase. The CHir phase shows a flat derivative at late times and was matched 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 $6.1 \cdot 10^{-6}$ 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 $2.0 \cdot 10^{-6}$ m^2/s to $9.0 \cdot 10^{-6}$ 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 3,880.5 kPa.

The analysis of the CHi and CHir phases shows little inconsistency in the derived transmissivity from the two test phases. No further analysis is recommended.

6.1.5 Section 504.00–604.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The relatively fast recovery of the pulse test indicated a moderate 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 201 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 4.5 L/min at start of the CHi phase to 2.6 L/min at the end, indicating a moderate 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 slight indication of horizontal stabilization at early times and a downward trend at middle times, followed by a new stabilization at late times, which is indicative for a transition to a zone of higher transmissivity at some distance from the borehole. The derivative of the CHir phase shows a kind of stabilization at middle times and a continuous downward trend at middle times. A radial two shell composite flow model was chosen for the analysis of both phases. The analysis is presented in Appendix 2-5.

Selected representative parameters

The recommended transmissivity of $2.7 \cdot 10^{-6}$ 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 $9.0 \cdot 10^{-7}$ 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 5,864.1 kPa.

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

6.2 20 m single-hole injection tests

In the following, the 20 m section tests conducted in borehole KLX18A are presented and analysed.

6.2.1 Section 104.00–124.00 m, test no. 1, injection

Comments to test

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

The CHi phase was conducted using a pressure difference of 200 kPa. The pressure in the bottom zone rose by approx. 15 kPa during injection, indicating a connection to the interval. The injection rate decreased from 13.0 L/min at start of the CHi phase to 9.5 L/min at the end, indicating a relatively high interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

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 stabilization at early times followed by a downward trend at middle times and a slight stabilization at late times. The response of the CHir phase is similar to the response of the CHi phase. A radial two shell composite radial flow model with increasing transmissivity was chosen for the analyses of both phases. The analysis is presented in Appendix 2-6.

Selected representative parameters

The recommended transmissivity of $8.1 \cdot 10^{-6}$ m^2/s was derived from the analysis of the CHi phase (inner zone), which shows the best derivative stabilization. The confidence range for the interval transmissivity is estimated to be $6.0 \cdot 10^{-6}$ 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 1,203.3 kPa.

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

6.2.2 Section 124.00–144.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The fast recovery of the pulse test indicated high 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 201 kPa. A slight reaction in the annulus was observed during the injection, indicating a connection to the interval. During the CHi phase the automatic regulation system functioned well. However, the recorded data is a little bit noisy. The injection rate decreased from 3.3 L/min at start of the CHi phase to 2.8 L/min at the end, indicating a relative high interval transmissivity (consistent with the pulse recovery). The CHir phase shows a relatively fast recovery. 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 (although noisy) shows a relative flat derivative, which is indicative for radial flow (n=2). A homogenous flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a unit slope downward trend at middle times, indicating a large positive skin and a horizontal stabilization at late times. The CHir phase was matched using a homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-7.

Selected representative parameters

The recommended transmissivity of $5.1 \cdot 10^{-6}$ 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 $2.0 \cdot 10^{-6}$ m²/s to $8.0 \cdot 10^{-6}$ 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 1,402.9 kPa.

The analysis of the CHi and CHir phases shows little inconsistency in the derived transmissivity from the two test phases. No further analysis is recommended.

6.2.3 Section 144.00–164.00 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 intervals was observed. The injection rate decreased from 880 mL/min at start of the CHi phase to 398 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a fast recovery at early times, which adds uncertainty to the early time data. 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 flat derivative at early and middle times followed by a downward trend at late times. This is indicative for either a change in flow dimension or a transition to a zone of higher transmissivity at some distance to the borehole. The response of the CHir phase shows a flat derivative at middle times and a downward trend at late times, too. Both phases were analysed using a radial two shell composite flow model. The analysis is presented in Appendix 2-8.

Selected representative parameters

The recommended transmissivity of $2.5 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHi phase (inner zone), which shows the best derivative stabilization. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-8}$ m²/s to $5.0 \cdot 10^{-7}$ 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 1,590.5 kPa.

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

6.2.4 Section 164.00–184.00 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 zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. Because of this, the pressure decreased during the injection by approx. 5 kPa. The injection rate decreased from 30 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). Because of the low flow rate at the end the recorded late time data of the flow rate is noisy. The CHir shows no problems. 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 relative flat derivative at early and middle times indicating a flow dimension of 2 (radial flow). The following late time derivative may show a slight upward trend, which is attributed to the noise in the recorded data. However, a homogeneous flow model was chosen 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 used for the analysis of the CHir phase. The analysis is presented in Appendix 2-9.

Selected representative parameters

The recommended transmissivity of $8.2 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHir phase, because of its better data quality. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-9}$ 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 1,792.0 kPa.

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

6.2.5 Section 184.00–204.00 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 from 13 mL/min at start of the CHi phase to 5 ml/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the low flow rate the recorded data of the flow rate is noisy, and adds uncertainties to the analysis of the CHi phase. The CHir 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 too noisy to allow flow model identification. However, a homogeneous flow model was chosen 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 used for the analysis of the CHir phase. The analysis is presented in Appendix 2-10.

Selected representative parameters

The recommended transmissivity of $3.4 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHir phase, because of its better data quality. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-9}$ 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 1,963.3 kPa.

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

6.2.6 Section 204.00–224.00 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 215 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. Because of this, the pressure decreased during the injection by approx. 2 kPa. 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). Due to the low flow rate the recorded data of the flow rate is noisy, and adds uncertainties to the analysis of the CHi phase. The recovery of the CHir phase was measured 0.8 h. 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 too noisy to allow flow model identification. However, a homogeneous flow model was chosen 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 used for the analysis of the CHir phase. The analysis is presented in Appendix 2-11.

Selected representative parameters

The recommended transmissivity of $6.4 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHir phase, because of its better data quality. The confidence range for the interval transmissivity is estimated to be $2.0 \cdot 10^{-9}$ m^2/s to $9.0 \cdot 10^{-9}$ 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 2,168.7 kPa.

The analyses of the CHi and CHir phases show little inconsistency in the derived transmissivities from the two test phases, which is attributed to poor data quality of the CHi phase. No further analysis is recommended.

6.2.7 Section 224.00–244.00 m, test no. 1, pulse injection

Comments to test

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

During the brief injection phase of the pulse injection a total volume of about 19 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 239 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $7.9 \cdot 10^{-11}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

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 continuing upward trend which can be interpreted to the fact that the dimensionless test time is to small and semi-logarithmic asymptotic solution was not achieved (due to the very small transmissivity). The PI phase was analysed using a radial homogeneous flow model. The analysis is presented in Appendix 2-12.

Selected representative parameters

The recommended transmissivity of $9.3 \cdot 10^{-11}$ m^2/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $6.0 \cdot 10^{-11}$ to $2.0 \cdot 10^{-10}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.2.8 Section 244.00–264.00 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 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 from 175 mL/min at start of the CHi phase to 70 ml/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). 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 stabilization at middle times followed by a downward trend at late times. This is indicative for an increase of transmissivity at some distance from the test section. A two shell composite flow model was used for the analysis of the CHi phase. The response of CHir phase is not consistent with the response of the CHi phase; The CHir phase shows an upward trend at late times indicating a decrease of transmissivity at some distance from the borehole. A two shell composite flow model was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-13.

Selected representative parameters

The recommended transmissivity of $1.8 \cdot 10^{-8}$ m²/s was derived from the analysis of the CHi phase (inner zone), which shows the better derivative stabilization. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-9}$ m²/s to $6.0 \cdot 10^{-8}$ m²/s (this range encompasses the inner zone transmissivity of the CHir phase). 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 2,543.4 kPa.

The analysis of the CHi and CHir phases shows consistency as far as the derived transmissivities are concerned. Regarding the chosen flow models the two test phases show inconsistency. This inconsistency is poorly understood. In case further analysis is planned, a total test simulation should attempt to clarify the inconsistency between the two phases.

6.2.9 Section 264.00–284.00 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 217 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. Because of this, the pressure decreased during the injection by approx. 5 kPa. The injection rate decreased from 29 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). Due to the low flow rate the recorded data of the flow rate is noisy, and adds uncertainties to the analysis of the CHi phase. 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 shows an upward trend at middle times followed by a kind of stabilization at late times. The derivative of the CHir phase shows a continuing upward trend at middle and late times. Both phases were matched using a two shell composite flow model with decreasing transmissivity away from the borehole. The analysis is presented in Appendix 2-14.

Selected representative parameters

The recommended transmissivity of $6.9 \cdot 10^{-9}$ m²/s was derived from the analysis of the CHir phase (inner zone), because of its better data quality. The confidence range for the interval transmissivity is estimated to be $3.0 \cdot 10^{-9}$ m²/s to $9.0 \cdot 10^{-9}$ 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 2,750.4 kPa.

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

6.2.10 Section 284.00–304.00 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 223 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. Because of this, the pressure decreased during the injection by approx. 2 kPa. 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). Due to the low flow rate the recorded data of the flow rate is noisy, and adds uncertainties to the analysis of the CHi phase. 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 too noisy to allow flow model identification. However, a homogeneous flow model was chosen 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 used for the analysis of the CHir phase. The analysis is presented in Appendix 2-15.

Selected representative parameters

The recommended transmissivity of $3.7 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHir phase, because of its better data quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-10}$ 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 2,938.4 kPa.

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

6.2.11 Section 304.00–324.00 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 connection between the test interval and the adjacent zones was observed. The automatic regulation system worked well. The recorded data is however noisy. The injection rate decreased from 64 mL/min at start of the CHi phase to 40 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase recovers relatively fast 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 CHi phase (although noisy) shows a relative flat derivative, which is indicative for radial flow (n=2). A homogenous flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a unit slope downward trend at middle times, indicating a large positive skin and a horizontal stabilization at late times. The CHir phase was matched using a homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-16.

Selected representative parameters

The recommended transmissivity of $2.1 \cdot 10^{-7}$ 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 $8.0 \cdot 10^{-8}$ m^2/s to $5.0 \cdot 10^{-7}$ 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 3,135.0 kPa.

The analysis of the CHi and CHir phases shows consistency with the exception of the very high skin derived from the CHir phase, which may be caused by non-Darcy flow effects in the formation. No further analysis is recommended.

6.2.12 Section 324.00–344.00 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 200 kPa. No connection between the test interval and the adjacent zones was observed. The automatic regulation system worked well. The recorded data is however noisy, which adds uncertainty to the CHi analysis. The injection rate decreased from 1.3 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). The CHir phase is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted 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 does not allow for accurate flow model identification. However, a homogenous flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a downward trend at middle times followed by a horizontal stabilization at late times. The CHir phase was matched using a two shell composite radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-17.

Selected representative parameters

The recommended transmissivity of $5.7 \cdot 10^{-6}$ m^2/s was derived from the analysis of the CHir phase (outer zone), which shows the best derivative stabilization. The confidence range for the interval transmissivity is estimated to be $2.0 \cdot 10^{-6}$ m^2/s to $9.0 \cdot 10^{-6}$ 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 3,330.2 kPa.

The analysis of the CHi and CHir phases shows inconsistency regarding the derived flow models from the two test phases, which is attributed to the noise in the derivative of the CHi phase. No further analysis is recommended.

6.2.13 Section 344.00–364.00 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 200 kPa. No connection between the test interval and the adjacent zones was observed. The automatic regulation system worked well, with the exception of some disturbance in the flow rate at early times. The recorded data is however noisy. The injection rate decreased from 2.0 L/min at start of the CHi phase to 1.8 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a fast recovery.

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 very noisy and does not allow for flow model identification. However, a homogenous flow model was used for the analysis of the CHi phase. Due to the fast recovery of the CHir phase the early and middle time response is not well known. The late time derivative shows a horizontal stabilization, indicating radial flow. The CHir phase was matched using a homogeneous flow model. The analysis is presented in Appendix 2-18.

Selected representative parameters

The recommended transmissivity of $9.3 \cdot 10^{-6}$ m^2/s was derived from the analysis of the CHir phase, which shows the slight better data and a horizontal stabilization of the derivative. The confidence range for the interval transmissivity is estimated to be $3.0 \cdot 10^{-6}$ m^2/s to $3.0 \cdot 10^{-5}$ 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 3,524.4 kPa.

The analysis of the CHi and CHir phases shows inconsistency in the derived transmissivities from the two test phases. This may be attributed to the fast recovery of the CHir phase and the poor data quality of the CHi phase. The very high skin derived from the CHir phase may be caused by non-Darcy flow effects in the formation. No further analysis is recommended.

6.2.14 Section 364.00–384.00 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 201 kPa. No connection between the test interval and the adjacent zones was observed. The automatic regulation system worked well, with the exception of some oscillations at the start of the injection caused by manual settings of the shunt valve. The recorded data is however a little bit noisy. The CHi phase is still adequate for quantitative analysis. The injection rate decreased from 1.3 L/min at start of the CHi phase to 0.6 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a relative fast recovery but is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase (although noisy) shows a relative flat derivative, which is indicative for radial flow. A homogenous flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a steep downward trend at middle times indicating a relative high skin. The late time derivative shows a horizontal stabilization. The CHir phase was matched using a homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-19.

Selected representative parameters

The recommended transmissivity of $2.1 \cdot 10^{-6}$ 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 $9.0 \cdot 10^{-7}$ 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 3,720.6 kPa.

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

6.2.15 Section 384.00–404.00 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 201 kPa. No connection between the test interval and the adjacent zones was observed. The automatic regulation system worked well. The recorded data is however noisy. The injection rate decreased from 1.1 L/min at start of the CHi phase to 0.5 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a relative fast recovery. 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 is noisy, but it is relative flat at early and middle times. A homogenous flow model was used for the analysis of the CHi phase. CHir phase shows a horizontal derivative stabilization at late times, indicating a flow dimension of 2 (radial flow). A homogeneous flow model was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-20.

Selected representative parameters

The recommended transmissivity of $1.9 \cdot 10^{-6}$ m²/s was derived from the analysis of the CHir phase, which shows the slight better data and a horizontal stabilization of the derivative. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-7}$ m²/s to $4.0 \cdot 10^{-6}$ 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 3,913.3 kPa.

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

6.2.16 Section 404.00–424.00 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 200 kPa. The pressure in the bottom zone rose approx. 6 kPa indicating connection to the test interval. The automatic regulation system worked well. The recorded data is however noisy, which adds some uncertainty to the CHi analysis. The injection rate decreased from 3.4 L/min at start of the CHi phase to 2.2 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the derivative of the CHi phase (although noisy) shows a relative flat derivative. A homogenous flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a downward trend at middle times followed by a horizontal stabilization at late times. The CHir phase was matched using a two shell composite radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-21.

Selected representative parameters

The recommended transmissivity of $7.3 \cdot 10^{-6}$ m²/s was derived from the analysis of the CHir phase (outer zone), which shows the better derivative stabilization. The confidence range for the interval transmissivity is estimated to be $2.0 \cdot 10^{-6}$ m²/s to $1.0 \cdot 10^{-5}$ m²/s (this range includes the inner zone transmissivity of the CHir phase). 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 4,107.1 kPa.

The analysis of the CHi and CHir phases shows inconsistency regarding the derived flow models from the two test phases, which is attributed to the noise in the derivative of the CHi phase. No further analysis is recommended.

6.2.17 Section 424.00–444.00 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 high formation transmissivity. Based on this result a sequence consisting of a constant pressure injection phase (CHi) and a recovery phase (CHir) was conducted. Only the CHi and CHir phases were analysed quantitatively.

The CHi phase was conducted using a pressure difference of 201 kPa. No connection between the test interval and the adjacent zones was observed. The automatic regulation system worked well. The recorded data is however a little bit noisy. The CHi phase is still adequate for quantitative analysis. The injection rate decreased from 4.3 L/min at start of the CHi phase to 2.6 L/min at the end, indicating a relative high interval transmissivity (consistent with the pulse recovery). The CHir phase shows a relative fast recovery but is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase (although noisy) shows a relative flat derivative, which is indicative for radial flow. A homogenous flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a steep downward trend at middle times indicating a relative high skin. The late time derivative shows a horizontal stabilization. The CHir phase was matched using a homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-22.

Selected representative parameters

The recommended transmissivity of $9.9 \cdot 10^{-6}$ m^2/s was derived from the analysis of the CHir phase, which shows the better derivative stabilization. The confidence range for the interval transmissivity is estimated to be $4.0 \cdot 10^{-6}$ m^2/s to $3.0 \cdot 10^{-5}$ 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 4,300.9 kPa.

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

6.2.18 Section 444.00–464.00 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 connection between the test interval and the adjacent zones was observed. The injection rate decreased from 225 mL/min at start of the CHi phase to 88 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative, which is indicative for radial flow. A homogenous flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a horizontal stabilization at late times. The CHir phase was matched using a homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-23.

Selected representative parameters

The recommended transmissivity of $6.5 \cdot 10^{-8}$ 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 $3.0 \cdot 10^{-8}$ m²/s to $9.0 \cdot 10^{-6}$ 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 4,494.7 kPa.

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

6.2.19 Section 464.00–484.00 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 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 connection between the test interval and the adjacent zones was observed. The automatic regulation system worked well. The recorded data is however a little bit noisy. The injection rate decreased from 200 mL/min at start of the CHi phase to 76 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases are adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase (although noisy) shows a flat derivative, which is indicative for radial flow. A homogenous flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a horizontal stabilization at late times. The CHir phase was matched using a homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-24.

Selected representative parameters

The recommended transmissivity of $1.1 \cdot 10^{-7}$ 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 $7.0 \cdot 10^{-8}$ m²/s to $3.0 \cdot 10^{-7}$ 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 4,695.3 kPa.

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

6.2.20 Section 484.00–504.00 m, test no. 1–3, injection

Comments to test

Test no. 1 was repeated due to a leakage in the pipe string system. After replacing the leaking pipe a second test was conducted. During the constant pressure injection phase the pressure difference in the section increased. Therefore the injection was skipped and a third test was conducted.

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 connection between the test interval and the adjacent zones was observed. At the start of the injection some oscillations occurred, caused by the adjustment of the automatic regulation system. The injection rate decreased from 90 mL/min at start of the CHi phase to 28 mL/min at the end, indicating a relative low interval transmissivity (consistent with the pulse recovery). Both phases are adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase was matched using a homogenous flow model. No clear flow stabilization was reached during the CHir phase and the data is still influenced by near wellbore effects like wellbore storage and skin. The CHir phase was matched using a homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-25.

Selected representative parameters

The recommended transmissivity of $1.6 \cdot 10^{-9}$ 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 $9.0 \cdot 10^{-10}$ 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 4,895.4 kPa.

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

6.2.21 Section 504.00–524.00 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 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 connection between the test interval and the adjacent zones was observed. The CHi phase shows no problems with the exception of some oscillations at start of the injection. The injection rate decreased from 67 mL/min at start of the CHi phase to 28 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases are adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase shows a flat derivative at middle and late times indicating for radial flow. A homogenous flow model was used for the analysis of the

CHi phase. The response of the CHir phase shows the transition from wellbore storage and skin dominated flow to pure formation flow. Because the formation flow stabilization was not reached 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 2-26.

Selected representative parameters

The recommended transmissivity of $1.7 \cdot 10^{-8}$ 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 $8.0 \cdot 10^{-9}$ m²/s to $4.0 \cdot 10^{-8}$ 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 5,096.4 kPa.

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

6.2.22 Section 524.00–544.00 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 201 kPa. No connection between the test interval and the adjacent zones was observed. The automatic regulation system worked well, with the exception of some oscillations at the start of the injection caused by manual settings of the shunt valve. The recorded data is however a little bit noisy. The CHi phase is still adequate for quantitative analysis. The injection rate decreased from 0.7 L/min at start of the CHi phase to 0.3 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a fast recovery but is adequate for quantitative analysis.

Flow regime and calculated parameters

The flow dimension is interpreted the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase (although noisy) shows a relative flat derivative, which is indicative for radial flow. A homogenous flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a steep downward trend at middle times indicating a relative high skin. The late time derivative shows a horizontal stabilization. The CHir phase was matched using a homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-27.

Selected representative parameters

The recommended transmissivity of $6.8 \cdot 10^{-7}$ 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 $1.0 \cdot 10^{-7}$ m²/s to $1.0 \cdot 10^{-6}$ 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 5,279.7 kPa.

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

6.2.23 Section 544.00–564.00 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 200 kPa. No connection between the test interval and the adjacent zones was observed. The automatic regulation system worked well. The recorded data is however a little bit noisy. The CHi phase is still adequate for quantitative analysis. The injection rate decreased from 1.6 L/min at start of the CHi phase to 0.7 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery).

Flow regime and calculated parameters

The flow dimension is interpreted the slope of the semi-log derivative plotted in log-log coordinates. In case of the present test the CHi phase (although noisy) shows a relative flat derivative on middle times, followed by a downward trend at late times. This behaviour indicates a change in transmissivity at some distance from the borehole. The response of the CHir phase is consistent to the CHi response. Both phases were matched using a two shell composite flow model with increasing transmissivity at some distance from the borehole. The analysis is presented in Appendix 2-28.

Selected representative parameters

The recommended transmissivity of $5.5 \cdot 10^{-7}$ 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 $1.0 \cdot 10^{-7}$ m^2/s to $9.0 \cdot 10^{-7}$ 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 5,477.6 kPa.

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

6.2.24 Section 564.00–584.00 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 connection between the test interval and the adjacent zones was observed. The automatic regulation system worked well. The recorded data is however noisy. The injection rate decreased from 98 mL/min at start of the CHi phase to 86 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase recovers very fast 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 is very noisy and does not allow for flow model identification. However, a homogenous flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a unit slope downward trend at middle times, indicating a large positive skin and a horizontal stabilization at late times. The CHir phase was matched using a homogeneous radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-29.

Selected representative parameters

The recommended transmissivity of $4.4 \cdot 10^{-7}$ m^2/s was derived from the analysis of the CHir phase, which shows a derivative stabilization at late times. 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 5,673.7 kPa.

The analysis of the CHi and CHir phases shows consistency with the exception of the very high skin derived from the CHir phase, which may be caused by non-Darcy flow effects in the formation. No further analysis is recommended.

6.2.25 Section 584.00–604.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The fast recovery of the pulse test indicated high 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. A slight reaction in the bottom zone was observed during the injection. During the CHi phase the automatic regulation system functioned well. However, the recorded data is noisy. The injection rate decreased from 1.6 L/min at start of the CHi phase to 1.5 L/min at the end, indicating a relative high interval transmissivity (consistent with the pulse recovery). 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 (although noisy) shows a relative flat derivative, which is indicative for radial flow (n=2). A homogenous flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a stabilization at middle times followed by an downward trend at late times indicating a change in transmissivity at some distance from the test section. The CHir phase was matched using a two shell composite radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-30.

Selected representative parameters

The recommended transmissivity of $1.6 \cdot 10^{-6}$ m^2/s was derived from the analysis of the CHir phase (inner zone), which shows a derivative stabilization at middle times. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-7}$ 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 5,869.7 kPa.

The analysis of the CHi and CHir phases shows inconsistency regarding the chosen flow models. This inconsistency can be attributed to the noise in the CHi phase. However regarding the derived transmissivity the two test phases show consistency. No further analysis is recommended.

6.3 5 m single-hole injection tests

In the following, the 5 m section tests conducted in borehole KLX18A are presented and analysed.

6.3.1 Section 299.00–304.00 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 225 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. Because of this, the pressure decreased during the injection by approx. 4 kPa. The injection rate decreased from 3 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 recorded data of the flow rate is very noisy, and adds uncertainties to the analysis of the CHi phase. The CHir phase shows a relative fast recovery, compared to the observation during the injection phase and expected low transmissivity. The CHir phase 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 very noisy and does not allow for flow model identification. However, a homogenous radial flow model was chosen for the analysis of the CHi phase. The derivative of the CHir phase shows a steep downward trend at middle and late times, which is indicative for a high positive skin. The analysis is presented in Appendix 2-31.

Selected representative parameters

The recommended transmissivity of $6.5 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHir phase, because of its better data 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 2,942.8 kPa.

The analyses of the CHi and CHir phases show some inconsistency, caused by the poor data quality of the CHi phase. The high positive skin derived from the CHir phase may be attributed to non-Darcy flow effects in the formation. No further analysis is recommended.

6.3.2 Section 304.00–309.00 m, test no. 1, pulse injection

Comments to test

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

During the brief injection phase of the pulse injection a total volume of about 3 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 228 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.5 \cdot 10^{-11}$ m³/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

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 continuing upward trend, indicating a decrease of transmissivity at some distance from the borehole. The PI phase was analysed using a two shell composite flow model. The analysis is presented in Appendix 2-32.

Selected representative parameters

The recommended transmissivity of $1.3 \cdot 10^{-11}$ m²/s was derived from the analysis of the Pi phase (inner zone). The confidence range for the interval transmissivity is estimated to be $2.0 \cdot 10^{-12}$ to $3.0 \cdot 10^{-11}$ m²/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.3.3 Section 309.00–314.00 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 231 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. However, the pressure decreased during the injection by only 1 kPa. The injection rate decreased from 4 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 recorded data of the flow rate is very noisy, and adds uncertainties to the analysis of the CHi phase. The CHir phase shows a relative fast recovery, compared to the observation during the injection phase and expected low transmissivity. The CHir phase 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 very noisy and does not allow for flow model identification. However, a homogenous radial flow model was chosen for the analysis of the CHi phase. The derivative of the CHir phase shows a steep downward trend at middle and late times, which is indicative for a high positive skin. The analysis is presented in Appendix 2-33.

Selected representative parameters

The recommended transmissivity of $9.7 \cdot 10^{-9}$ 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 $6.0 \cdot 10^{-9}$ 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 3,037.7 kPa.

The analyses of the CHi and CHir phases show some inconsistency, caused by the poor data quality of the CHi phase. The high positive skin derived from the CHir phase may be attributed to non-Darcy flow effects in the formation. No further analysis is recommended.

6.3.4 Section 314.00–319.00 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. This phenomenon is caused by a combination of prolonged packer expansion and a very tight section (T probably smaller than 1E–11 m^2/s). 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 2-34.

Selected representative parameters

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

No further analysis recommended.

6.3.5 Section 319.00–324.00 m, test no. 1, injection

Comments to test

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

The CHi phase was conducted using a pressure difference of 199 kPa. No hydraulic connection to the adjacent zones was observed. The automatic regulation system functioned well. However, the recorded data is a little bit noisy. The injection rate decreased from 40 mL/min at start of the CHi phase to 36 ml/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). 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 was matched using a homogeneous radial flow model. The derivative of the CHir phase shows horizontal stabilization at late times. A homogeneous flow model with wellbore and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-35.

Selected representative parameters

The recommended transmissivity of $7.3 \cdot 10^{-8}$ m²/s was derived from the analysis of the CHir phase, which shows the clearest derivative stabilization. The confidence range for the interval transmissivity is estimated to be $4.0 \cdot 10^{-8}$ m²/s to $2.0 \cdot 10^{-7}$ 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 3,138.9 kPa.

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

6.3.6 Section 324.00–329.00 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. This phenomenon is caused by a combination of prolonged packer expansion and a very tight section (T probably smaller than 1E–11 m²/s). 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 2-36.

Selected representative parameters

Based on the test response the interval transmissivity is lower than $1.0 \cdot 10^{-11}$ m²/s.

No further analysis recommended.

6.3.7 Section 329.00–334.00 m, test no. 1, injection

Comments to test

The test design consisted of a preliminary pulse injection test conducted with the goal of deriving a first estimate of the formation transmissivity. The fast recovery of the pulse test indicated high 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 201 kPa. No hydraulic injection between the interval and the adjacent zones was observed. The injection rate decreased from approx. 0.5 L/min at start of the CHi phase to 0.3 L/min at the end, indicating a medium transmissivity (consistent with the pulse recovery). 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 flat derivative, which is indicative for radial flow (n=2). A homogenous flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows stabilization at middle times followed by a downward trend at late times. This is indicative for a change in transmissivity at some distance from the test section. The CHir phase was matched using a two shell composite radial flow model with wellbore storage and skin. The analysis is presented in Appendix 2-37.

Selected representative parameters

The recommended transmissivity of $4.1 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHi phase, which shows better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-7}$ m²/s to $7.0 \cdot 10^{-7}$ 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 3,234.0 kPa.

The analysis of the CHi and CHir phases shows inconsistency regarding the chosen flow models. This inconsistency is poorly understood. If further analysis is planned a total test simulation should help resolving this inconsistency.

6.3.8 Section 334.00–339.00 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 connection between the test interval and the adjacent zones was observed. The automatic regulation system worked well. The recorded data is however noisy. The injection rate decreased from 0.6 L/min at start of the CHi phase to 0.5 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a fast recovery. The noise in the data of the CHi phase and the fast recovery of the CHir phase adds some uncertainties to the 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 very noisy and does not allow for flow model identification. However, a homogenous flow model was used for the analysis of the CHi phase. Due to the fast recovery of the CHir phase the early and middle time response is not well known. The late time response shows a horizontal derivative stabilization. The CHir phase was matched using a composite flow model with wellbore storage and skin. The analysis is presented in Appendix 2-38.

Selected representative parameters

The recommended transmissivity of $7.0 \cdot 10^{-6}$ m²/s was derived from the analysis of the CHir phase (outer zone), which shows a horizontal stabilization of the derivative. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-6}$ m²/s to $1.0 \cdot 10^{-5}$ 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 3,283.3 kPa.

The analysis of the CHi and CHir phases shows some inconsistency regarding the chosen flow model. This inconsistency is attributed to the noise in the CHi phase and the fast recovery of the CHir phase. However, due to the poor data quality, no further analysis is recommended.

6.3.9 Section 339.00–344.00 m, test no. 1, injection

Comments to test

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

The CHi phase was conducted using a pressure difference of 201 kPa. No connection between the test interval and the adjacent zones was observed. The injection rate decreased from 0.3 L/min at start of the CHi phase to 0.2 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a very fast recovery and 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 derivative of the CHi phase shows an upward trend at middle times followed by a kind of stabilization at late times. A two shell composite flow model with decreasing transmissivity at some distance from the borehole was used for the analysis of the CHi phase. Due to the very fast recovery of the CHir phase the derivative is not very conclusive. However, a homogeneous radial flow model was chosen for the analysis. The analysis is presented in Appendix 2-39.

Selected representative parameters

The recommended transmissivity of $3.2 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHi phase (outer zone), which shows a slight horizontal stabilization of the derivative. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-8}$ m²/s to $6.0 \cdot 10^{-7}$ 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 3,332.1 kPa.

The analysis of the CHi and CHir phases shows some inconsistency regarding the chosen flow model. This inconsistency is attributed to the very fast recovery of the CHir phase. However, due to the poor data quality of the CHir phase, no further analysis is recommended.

6.3.10 Section 344.00–349.00 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 connection between the test interval and the adjacent zones was observed. The automatic regulation system worked well. The recorded data is however a little bit noisy. The injection rate decreased from 1.4 L/min at start of the CHi phase to 1.3 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a fast recovery, which adds some uncertainties to the 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 (although noisy) shows a relative flat derivative which is indicative for radial flow. A homogenous flow model was used for the analysis of the CHi phase. Due to the fast recovery of the CHir phase the early and middle time response is not well known. The late time response shows a horizontal derivative stabilization. The CHir phase was matched using a composite flow model with wellbore storage and skin. The analysis is presented in Appendix 2-40.

Selected representative parameters

The recommended transmissivity of $2.3 \cdot 10^{-6}$ m²/s was derived from the analysis of the CHi phase, because it shows a better quality. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-7}$ m²/s to $6.0 \cdot 10^{-6}$ 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 3,380.4 kPa.

No further analysis is recommended.

6.3.11 Section 349.00–354.00 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 173 kPa. No hydraulic connection to the adjacent zones was observed. No suitable adjustments for the automatic regulation unit were found to perform an injection with stable pressure condition in this test section and therefore the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. Because of this, the pressure decreased during the injection by approx. 13 kPa. The injection rate decreased from approx. 27 mL/min at start of the CHi phase to approx. 26 ml/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Due to oscillation during the CHi phase the results should be regarded as order of magnitude only. The CHir phase shows a fast recovery, but is amenable for qualitative 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 early and middle time derivative of the CHi phase is of poor quality. Only the late time derivative of the CHi phase was matched using a homogeneous radial flow model. The derivative of the CHir phase shows a steep downward trend at middle times and a horizontal stabilization at late times. This behaviour is indicative for a high positive skin. The analysis is presented in Appendix 2-41.

Selected representative parameters

The recommended transmissivity of $1.0 \cdot 10^{-7}$ m²/s was derived from the analysis of the CHir phase, because of its derivative stabilization at late times. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-8}$ m²/s to $5.0 \cdot 10^{-7}$ 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 3,428.1 kPa.

The analyses of the CHi and CHir phases show some inconsistency in the derived transmissivities, caused by the poor data quality of the CHi phase. The high positive skin derived from the CHir phase may be attributed to non-Darcy flow effects in the formation. No further analysis is recommended.

6.3.12 Section 354.00–359.00 m, test no. 1, pulse injection

Comments to test

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

During the brief injection phase of the pulse injection a total volume of about 70 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 218 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $3.1 \cdot 10^{-10}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

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 was matched using a two shell composite flow model with decreasing transmissivity away from the borehole. The analysis is presented in Appendix 2-42.

Selected representative parameters

The recommended transmissivity of $7.9 \cdot 10^{-10}$ m^2/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $3.0 \cdot 10^{-10}$ to $9.0 \cdot 10^{-10}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.3.13 Section 359.00–364.00 m, test no. 1, injection

Comments to test

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

The CHi phase was conducted using a pressure difference of 201 kPa. No hydraulic connection to the adjacent zones was observed. The automatic regulation system worked well. However, the recorded data is a little bit noisy. The injection rate decreased from 0.7 L/min at start of the CHi phase to 0.5 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a fast recovery which adds some uncertainties to the 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 (although noisy) shows a relative flat derivative. A homogenous radial flow model was chosen for the analysis of the CHi phase. Due to the fast recovery the early and middle time response of the CHir phase is not well known. The late time response shows a flat derivative indicating radial flow. A homogeneous flow model with wellbore storage and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-43.

Selected representative parameters

The recommended transmissivity of $1.2 \cdot 10^{-6}$ 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 $7.0 \cdot 10^{-7}$ m²/s to $4.0 \cdot 10^{-6}$ 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 3,527.2 kPa.

The analyses of the CHi and CHir phases show good consistency, with the exception of the high positive skin derived from the CHir phase. This high positive skin may be attributed to non-Darcy flow effects in the formation. No further analysis is recommended.

6.3.14 Section 364.00–369.00 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 201 kPa. No hydraulic connection to the adjacent zones was observed. The automatic regulation system worked well. However, the recorded data is a little bit noisy. The injection rate decreased from 0.6 L/min at start of the CHi phase to 0.5 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). 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 is noisy, which adds some uncertainties to the analysis. However, a homogenous radial flow model was chosen for the analysis of the CHi phase. The late time response of the CHir phase shows a flat derivative indicating radial flow. A homogeneous flow model with wellbore storage and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-44.

Selected representative parameters

The recommended transmissivity of $1.3 \cdot 10^{-6}$ m²/s was derived from the analysis of the CHir phase, which shows a horizontal derivative stabilization. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-7}$ 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 3,573.6 kPa.

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

6.3.15 Section 369.00–374.00 m, test no. 1, injection

Comments to test

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

The CHi phase was conducted using a pressure difference of 201 kPa. No connection between the test interval and the adjacent zones was observed. The injection rate decreased from 0.22 L/min at start of the CHi phase to 0.21 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Due to the small changes in the flow rate the recorded data is noisy and not very conclusive. The CHir phase shows a fast recovery. The noise in the data of the CHi phase and the fast recovery of the CHir phase adds some uncertainties to the 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 very noisy and does not allow for flow model identification. However, a homogenous flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a horizontal stabilization of the derivative at late times, which is indicative for radial flow. The CHir phase was matched using a homogeneous flow model with wellbore storage and skin. The analysis is presented in Appendix 2-45.

Selected representative parameters

The recommended transmissivity of $7.8 \cdot 10^{-7}$ m^2/s was derived from the analysis of the CHir phase, which shows a horizontal stabilization of the derivative. The confidence range for the interval transmissivity is estimated to be $3.0 \cdot 10^{-7}$ m^2/s to $1.0 \cdot 10^{-6}$ 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 3,630.7 kPa.

No further analysis is recommended.

6.3.16 Section 374.00–379.00 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 connection between the test interval and the adjacent zones was observed. The injection rate decreased from 0.2 L/min at start of the CHi phase to 0.1 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a fast recovery.

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 a kind of stabilization at late times. A two shell composite flow model with decreasing transmissivity at some distance from the borehole was used for the analysis of the CHi phase. Due to the very fast recovery of the CHir phase the derivative is not very conclusive, but it shows a horizontal stabilization at late times. A homogeneous radial flow model was chosen for the analysis. The analysis is presented in Appendix 2-46.

Selected representative parameters

The recommended transmissivity of $1.5 \cdot 10^{-7}$ m^2/s was derived from the analysis of the CHi phase (outer zone), which shows a better data quality and a slight horizontal stabilization of the derivative. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-8}$ 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 3,675.2 kPa.

The analysis of the CHi and CHir phases shows some inconsistency as far as the flow model concerned. This may be attributed to the very fast recovery of the CHir phase. No further analysis is recommended.

6.3.17 Section 379.00–384.00 m, test no. 1, injection

Comments to test

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

The CHi phase was conducted using a pressure difference of 199 kPa. No hydraulic connection to the adjacent zones was observed. The automatic injection system functioned well. However, the recorded data is a little bit noisy. The injection rate decreased from 90 mL/min at start of the CHi phase to 77 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a relative fast recovery.

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 was matched using a homogeneous radial flow model. The derivative of the CHir phase shows a steep downward trend at middle times, indicating a large positive skin. The late time response shows a horizontal stabilization of the derivative. The analysis is presented in Appendix 2-47.

Selected representative parameters

The recommended transmissivity of $2.9 \cdot 10^{-7}$ 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 $9.0 \cdot 10^{-8}$ m^2/s to $5.0 \cdot 10^{-7}$ 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 3,721.3 kPa.

The analyses of the CHi and CHir phases show consistency. The high positive skin derived from the CHir phase may be attributed to non-Darcy flow effects in the formation. No further analysis is recommended.

6.3.18 Section 384.00–389.00 m, test no. 1, injection

Comments to test

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

The CHi phase was conducted using a pressure difference of 199 kPa. No hydraulic connection to the adjacent zones was observed. The automatic injection system functioned well. However, the recorded data is a little bit noisy. The injection rate decreased from 141 mL/min at start of the CHi phase to 120 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a relative fast recovery.

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 was matched using a homogeneous radial flow model. The derivative of the CHir phase shows a steep downward trend at middle times, indicating a large positive skin. The late time response is a little bit noisy but it shows a horizontal stabilization of the derivative. The analysis is presented in Appendix 2-48.

Selected representative parameters

The recommended transmissivity of $4.5 \cdot 10^{-7}$ 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 $1.0 \cdot 10^{-7}$ m^2/s to $9.0 \cdot 10^{-7}$ 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 3,769.1 kPa.

The analyses of the CHi and CHir phases show consistency. The high positive skin derived from the CHir phase may be attributed to non-Darcy flow effects in the formation. No further analysis is recommended.

6.3.19 Section 389.00–394.00 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 232 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. Because of the poor pressure control during the injection the pressure rose by 4 kPa. The injection rate decreased from 8 mL/min at start of the CHi phase to 3 ml/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the low flow rate the recorded data of the flow rate is very noisy, and adds uncertainties to the analysis of the CHi phase. The CHir phase shows a relative fast recovery, compared to the observation during the injection phase and expected low transmissivity.

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 and late times, which is indicative for a change of transmissivity at some distance form the borehole. A two shell composite radial flow model was chosen for the analysis of the CHi phase. The derivative of the CHir phase shows a steep downward trend at late times, which is typical for a transition from wellbore storage and skin dominated flow to pure formation flow. In addition, this behaviour indicates a large positive skin. A homogeneous flow model with wellbore storage and skin was used. The analysis is presented in Appendix 2-49.

Selected representative parameters

The recommended transmissivity of $2.0 \cdot 10^{-9}$ m^2/s was derived from the analysis of the CHi phase (inner zone), which shows a slight better derivative quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-10}$ 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 3,817.3 kPa.

The analyses of the CHi and CHir phases show some inconsistency in the chosen flow models and the high skin derived from the CHir phase. This can be attributed to the poor the poor data quality of the CHi phase and the fast recovery of the CHir phase. No further analysis is recommended.

6.3.20 Section 394.00–399.00 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 automatic regulation system worked well. However, the recorded data is very noisy. The injection rate decreased from 18 mL/min at start of the CHi phase to 15 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a fast recovery, but is amenable for qualitative 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 of poor quality. However, the CHi phase was matched using a homogeneous radial flow model. The derivative of the CHir phase shows a steep downward trend at middle times and a kind of horizontal stabilization at late times. This behaviour is indicative for a high positive skin. The analysis is presented in Appendix 2-50.

Selected representative parameters

The recommended transmissivity of $5.5 \cdot 10^{-8}$ m^2/s was derived from the analysis of the CHir phase, because of the slight stabilization of the derivative. 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 3,865.8 kPa.

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

6.3.21 Section 399.00–404.00 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 connection between the test interval and the adjacent zones was observed. The injection rate decreased from 0.5 L/min at start of the CHi phase to 0.4 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHi phase shows no problems and is amenable for qualitative analysis. The CHir phase shows a fast recovery, which adds some uncertainties to the 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 flat derivative at early times followed by an upward trend at middle times and a kind of horizontal stabilization at late times. This is consistent with a decrease of transmissivity at some distance from the borehole. A two shell composite flow model was used for the analysis of the CHi phase. Due to the fast recovery of the CHir phase the early and middle time response is not well known. The late time response shows a horizontal derivative stabilization. The CHir phase was matched using a homogeneous flow model with wellbore storage and skin. The analysis is presented in Appendix 2-51.

Selected representative parameters

The recommended transmissivity of $7.0 \cdot 10^{-7}$ m^2/s was derived from the analysis of the CHi phase (inner zone), because it shows a better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $3.0 \cdot 10^{-7}$ m^2/s to $1.0 \cdot 10^{-6}$ m^2/s (this range includes the inner zone transmissivity of the CHi phase). 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 3,908.0 kPa.

The analyses of the CHi and CHir phases show inconsistency regarding the chosen flow models of the two test phases and the relative high positive skin derived from the CHir phase, which may be attributed to the fast recovery of the CHir phase. However, due to the poor data quality of the CHir phase, no further analysis is recommended.

6.3.22 Section 404.00–409.00 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 223 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. Because of this, the pressure decreased during the injection by approx. 12 kPa. The injection rate decreased from 50 mL/min at start of the CHi phase to 30 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). The CHir phase shows a relative fast recovery. 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 flat derivative at early times followed by an upward trend at middle times. This is consistent with a decrease of transmissivity at some distance from the borehole. A two shell composite flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a steep downward trend at middle and late times, which is indicative for a high positive skin. The analysis is presented in Appendix 2-52.

Selected representative parameters

The recommended transmissivity of $2.9 \cdot 10^{-8}$ m²/s was derived from the analysis of the CHi phase (inner zone), because of its better data quality. The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-9}$ m²/s to $5.0 \cdot 10^{-8}$ 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 3,957.7 kPa.

The analyses of the CHi and CHir phases show some inconsistency, caused probably by the fast recovery of the CHir phase. The high positive skin derived from the CHir phase may be attributed to non-Darcy flow effects in the formation. No further analysis is recommended.

6.3.23 Section 409.00–414.00 m, test no. 1, injection

Comments to test

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

The CHi phase was conducted using a pressure difference of 201 kPa. No connection between the test interval and the adjacent zones was observed. The injection rate decreased from 0.5 mL/min at start of the CHi phase to 0.4 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHi phase shows no problems and is adequate for qualitative analysis. The CHir phase shows a fast recovery, which adds some uncertainties to the 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 trend at middle times indicating a decrease of transmissivity at some distance from the borehole. A two shell composite flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows unit slope upward trend at middle times, indicating a large positive skin, followed by a horizontal stabilization. The CHir phase was matched using a homogeneous flow model with wellbore storage and skin. The analysis is presented in Appendix 2-53.

Selected representative parameters

The recommended transmissivity of $8.0 \cdot 10^{-8}$ m²/s was derived from the analysis of the CHi phase (inner zone), because it shows a better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-8}$ m²/s to $1.0 \cdot 10^{-7}$ 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 4,006.8 kPa.

The analyses of the CHi and CHir phases show inconsistency regarding the chosen flow models of the two test phases and the relative high positive skin derived from the CHir phase, which may be attributed to the fast recovery of the CHir phase. No further analysis is recommended.

6.3.24 Section 414.00–419.00 m, test no. 1 and 2, injection

Comments to test

The first test in this section was repeated, because of a failure in the main power supply of the PSS. The second test was performed without technical problems.

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 automatic regulation system worked well. However, the recorded data is noisy. The injection rate decreased from 0.3 L/min at start of the CHi phase to 0.2 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a relative fast recovery.

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 but relative flat derivative. A homogenous radial flow model was chosen for the analysis of the CHi phase. Due to the fast recovery the early and middle time response of the CHir phase is not very conclusive. The late time response shows a flat derivative indicating radial flow. A homogeneous flow model with wellbore storage and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-54.

Selected representative parameters

The recommended transmissivity of $8.8 \cdot 10^{-7}$ m^2/s was derived from the analysis of the CHir phase, which shows the better derivative stabilization. The confidence range for the interval transmissivity is estimated to be $4.0 \cdot 10^{-7}$ 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 4,055.8 kPa.

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

6.3.25 Section 419.00–424.00 m, test no. 1, injection

Comments to test

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

The CHi phase was conducted using a pressure difference of 201 kPa. During injection the pressure in the bottom zone rose by 6 kPa. The automatic regulation system worked well. However, the recorded data is noisy. The injection rate decreased from 2.2 L/min at start of the CHi phase to 2.0 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a relative fast recovery.

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 but relative flat derivative. A homogenous radial flow model was chosen for the analysis of the CHi phase. The late time response of the CHir phase shows a flat derivative indicating radial flow. A homogeneous flow model with wellbore storage and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-55.

Selected representative parameters

The recommended transmissivity of $7.2 \cdot 10^{-6}$ m²/s was derived from the analysis of the CHir phase, which shows the better derivative stabilization. The confidence range for the interval transmissivity is estimated to be $3.0 \cdot 10^{-6}$ m²/s to $1.0 \cdot 10^{-5}$ 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 4,105.4 kPa.

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

6.3.26 Section 424.00–429.00 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 between the test interval and the adjacent zones was observed. The automatic regulation system worked well. However, the recorded data is noisy. The injection rate decreased from 1.6 L/min at start of the CHi phase to 1.4 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a fast recovery. The noise in the recorded data of the CHi phase and the fast recovery of the CHir phase, adds some uncertainty to the 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 was matched using a two shell composite flow model with decreasing transmissivity away from the borehole. Due to the fast recovery of the CHir phase the derivative is not very conclusive. However, a homogeneous 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 $3.4 \cdot 10^{-6}$ m²/s was derived from the analysis of the CHi phase (inner zone), which shows the slight better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $5.0 \cdot 10^{-7}$ m²/s to $7.0 \cdot 10^{-6}$ 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 4,153.3 kPa.

The analyses of the CHi and CHir phases show inconsistency as far as the flow model concerned. However, due to the poor data quality, no further analysis is recommended.

6.3.27 Section 429.00–434.00 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 between the test interval and the adjacent zones was observed. The automatic regulation system worked well. However, the recorded data is noisy. The injection rate decreased from 1.6 L/min at start of the CHi phase to 1.4 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a fast recovery.

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 was matched using a homogeneous radial flow model. The early and middle time response of the derivative is not well known, but it shows relative clear formation flow stabilization at late times. A homogeneous flow model with wellbore storage and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-57.

Selected representative parameters

The recommended transmissivity of $5.2 \cdot 10^{-6}$ m^2/s was derived from the analysis of the CHir phase, because of its horizontal derivative stabilization at late times. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-7}$ m^2/s to $9.0 \cdot 10^{-6}$ 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 4,200.4 kPa.

No further analysis is recommended.

6.3.28 Section 434.00–439.00 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 between the test interval and the adjacent zones was observed. The automatic regulation system worked well. However, the recorded data is noisy. The injection rate decreased from 45 mL/min at start of the CHi phase to 39 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). 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 was matched using a homogeneous radial flow model. The derivative of the CHir phase shows a downward trend at middle times followed by a kind of stabilization at late times. This behaviour indicates an increase of transmissivity at some distance from the borehole. A two shell composite flow model with wellbore storage and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-58.

Selected representative parameters

The recommended transmissivity of $2.6 \cdot 10^{-8}$ 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 $9.0 \cdot 10^{-9}$ m²/s to $6.0 \cdot 10^{-8}$ 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 4,250.3 kPa.

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

6.3.29 Section 439.00–444.00 m, test no. 1, pulse injection

Comments to test

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

During the brief injection phase of the pulse injection a total volume of about 4 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 $1.9 \cdot 10^{-11}$ m³/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

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 was matched using a two shell composite flow model with decreasing transmissivity away from the borehole. The analysis is presented in Appendix 2-59.

Selected representative parameters

The recommended transmissivity of $6.2 \cdot 10^{-11}$ 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 $9.0 \cdot 10^{-11}$ m²/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.3.30 Section 444.00–449.00 m, test no. 1, pulse injection

Comments to test

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

During the brief injection phase of the pulse injection a total volume of about 2 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 $9.9 \cdot 10^{-12}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

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 was matched using a homogeneous radial flow model. The analysis is presented in Appendix 2-60.

Selected representative parameters

The recommended transmissivity of $1.0 \cdot 10^{-11}$ m^2/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-12}$ to $3.0 \cdot 10^{-11}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.3.31 Section 449.00–454.00 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 217 kPa. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. Because of this, the pressure decreased during the injection by approx. 3 kPa. The injection rate decreased from 5 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 recorded data of the 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 both phases were matched using a homogeneous radial flow model. The analysis is presented in Appendix 2-61.

Selected representative parameters

The recommended transmissivity of $4.2 \cdot 10^{-10}$ m^2/s was derived from the analysis of the CHir phase, because of its better data quality. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-10}$ m^2/s to $7.0 \cdot 10^{-10}$ 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 4,393.1 kPa.

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

6.3.32 Section 454.00–459.00 m, test no. 1, injection

Comments to test

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

The CHi phase was conducted using a pressure difference of 201 kPa. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 112 mL/min at start of the CHi phase to 90 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

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 stabilization at early times followed by a downward trend at middle times, indicating an increase in transmissivity at some distance from the borehole. The response of the CHir phase is consistent to the response of the CHi phase. Both phases were matched using a two shell composite flow model. The analysis is presented in Appendix 2-62.

Selected representative parameters

The recommended transmissivity of $6.5 \cdot 10^{-08}$ 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 $3.0 \cdot 10^{-08}$ m^2/s to $1.0 \cdot 10^{-07}$ 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 4,445.1 kPa.

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

6.3.33 Section 459.00–464.00 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 zones was observed. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. However, no pressure loss occurred during the injection. The injection rate decreased from 4 mL/min at start of the CHi phase to 1 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the low flow rate the recorded data of the flow rate is noisy. 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 not very conclusive due to the noise in the recorded data. However, a homogeneous radial flow model was used for the analysis of the CHi phase. The CHir shows a downward trend at late times. This behaviour indicates a transition from wellbore storage and skin dominated flow to pure formation flow. A homogeneous radial flow model was matched using a homogeneous flow model with wellbore storage and skin. The analysis is presented in Appendix 2-63.

Selected representative parameters

The recommended transmissivity of $3.5 \cdot 10^{-10}$ 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 $9.0 \cdot 10^{-11}$ m^2/s to $6.0 \cdot 10^{-10}$ 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 4,492.0 kPa.

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

6.3.34 Section 464.00–469.00 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 254 kPa. No hydraulic connection to the adjacent zones was observed. No hydraulic connection to the adjacent zones was observed. Due to the expected small injection rate, the CHi phase was conducted without the automatic regulation, directly from the injection vessel with N_2 backpressure. Because of this, the pressure decreased during the injection by approx. 2 kPa. The injection rate decreased from 4 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 recorded data of the 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 derivative of the CHi phase is not very conclusive due to the noise in the recorded data. However, a homogeneous radial flow model was used for the analysis of the CHi phase. The CHir shows a downward trend at late times. This behaviour indicates a transition from wellbore storage and skin dominated flow to pure formation flow. A homogeneous radial flow model was matched using a homogeneous flow model with wellbore storage and skin. The analysis is presented in Appendix 2-64.

Selected representative parameters

The recommended transmissivity of $7.6 \cdot 10^{-10}$ 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 $2.0 \cdot 10^{-09}$ 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 4,538.1 kPa.

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

6.3.35 Section 469.00–474.00 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 between the test interval and the adjacent zones was observed. The automatic regulation system worked well. However, the recorded data is noisy. The injection rate decreased from 21 mL/min at start of the CHi phase to 18 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase recovers relatively fast, but 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, which adds some uncertainties to the analysis. The CHi phase was matched using a homogeneous radial flow model. The derivative of the CHir phase shows a steep downward trend at middle times (indicative for a high positive skin) followed by a horizontal stabilization at late times. A homogeneous flow model with wellbore storage and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-65.

Selected representative parameters

The recommended transmissivity of $6.4 \cdot 10^{-8}$ m^2/s was derived from the analysis of the CHir phase, which shows a horizontal stabilization of the derivative. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-8}$ m^2/s to $9.0 \cdot 10^{-8}$ 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 4,599.8 kPa.

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

6.3.36 Section 474.00–479.00 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 between the test interval and the adjacent zones was observed. The injection rate decreased from 136 mL/min at start of the CHi phase to 80 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). 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 flat derivative at middle and late times, indicating a flow dimension of 2 (radial flow). The response of the CHir phase is similar to CHi response. Both phases were matched using a homogeneous radial flow model. The analysis is presented in Appendix 2-66.

Selected representative parameters

The recommended transmissivity of $9.9 \cdot 10^{-8}$ m^2/s was derived from the analysis of the CHi phase, which shows a slight better data and derivative quality. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-8}$ 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 4,647.4 kPa.

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

6.3.37 Section 477.00–482.00 m, test no. 1, injection

Comments to test

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

The CHi phase was conducted using a pressure difference of 201 kPa. No hydraulic connection between the test interval and the adjacent zones was observed. The automatic regulation system worked well. However, the recorded data is very noisy. The injection rate decreased from 13 mL/min at start of the CHi phase to 11 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). 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 not very conclusive. However, a homogeneous radial flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a horizontal stabilization at late times. The CHir phase was matched using a homogeneous flow model with wellbore storage and skin. The analysis is presented in Appendix 2-67.

Selected representative parameters

The recommended transmissivity of $3.2 \cdot 10^{-8}$ 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 $7.0 \cdot 10^{-9}$ 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 4,676.0 kPa.

No further analysis is recommended.

6.3.38 Section 482.00–487.00 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 198 kPa. No hydraulic connection between the test interval and the adjacent zones was observed. The injection rate decreased from 115 mL/min at start of the CHi phase to 56 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The Chi phase shows no problems, with the exceptions of some oscillations at beginning of the injection. The CHir phase shows no problems. Both phases are adequate for quantitative analyse.

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 and a horizontal stabilization at late times. This behaviour indicates a decrease of transmissivity at some distance from the borehole. A composite radial flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a continuous upward trend and middle and late times. The CHir phase was matched using a composite flow model with wellbore storage and skin was. The analysis is presented in Appendix 2-68.

Selected representative parameters

The recommended transmissivity of $2.6 \cdot 10^{-8}$ m^2/s was derived from the analysis of the CHi phase (outer zone), which shows the better data and derivative stabilization. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-9}$ 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, was derived from the CHir phase using straight line extrapolation in the Horner plot to a value of 4,711.5 kPa.

No further analysis is recommended.

6.3.39 Section 487.00–492.00 m, test no. 1, injection

Comments to test

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

The CHi phase was conducted using a pressure difference of 201 kPa. No hydraulic connection to the adjacent zones was observed. The automatic regulation system worked well. However, the recorded data is noisy and shows some oscillations. The injection rate decreased from 54 mL/min at start of the CHi phase to 33 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a fast recovery which adds some uncertainties to the 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 and late times. A two shell composite radial flow model was chosen for the analysis of the CHi phase. The derivative of CHir phase shows a unit slope downward trend indicating a high positive skin followed by a horizontal stabilization. A homogeneous flow model with wellbore storage and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-69.

Selected representative parameters

The recommended transmissivity of $4.4 \cdot 10^{-8}$ 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 $1.0 \cdot 10^{-8}$ m^2/s to $9.0 \cdot 10^{-8}$ 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 4,772.5 kPa.

The analyses of the CHi and CHir phases show inconsistency regarding the chosen flow models, which may be attributed to the fast recovery of the CHir phase. No further analysis is recommended.

6.3.40 Section 489.00–494.00 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 relative fast 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 71 mL/min at start of the CHi phase to 44 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analysis.

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 derivative at early times followed by a downward trend at middle times and a new stabilization at late times. This behaviour is indicative for an increase in transmissivity at some distance from the borehole. The response of the CHir phase is consistent to the response of the CHi phase. A two shell composite radial flow model was used for the analyses of both phases. The analysis is presented in Appendix 2-70.

Selected representative parameters

The recommended transmissivity of $2.5 \cdot 10^{-8}$ 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 $9.0 \cdot 10^{-9}$ 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 4,790.3 kPa.

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

6.3.41 Section 494.00–499.00 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. No hydraulic connection to the adjacent zones was observed. The injection rate decreased from 9 mL/min at start of the CHi phase to 4 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). Due to the low flow rate the recorded data of the flow rate is noisy. 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 not very conclusive due to the noise in the recorded data. However, a homogeneous radial flow model was used for the analysis of the CHi phase. The CHir shows a downward trend at late times. This behaviour indicates a transition from wellbore storage and skin dominated flow to pure formation flow. A homogeneous radial flow model was matched using a homogeneous flow model with wellbore storage and skin. The analysis is presented in Appendix 2-71.

Selected representative parameters

The recommended transmissivity of $3.5 \cdot 10^{-09}$ 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 $1.0 \cdot 10^{-09}$ m^2/s to $5.0 \cdot 10^{-09}$ 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 4,857.9 kPa.

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

6.3.42 Section 499.00–504.00 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 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.

During the CHi phase the flow rate dropped below 1 mL/min. Because of this the injection was stopped and no CHir phase was conducted. Instead, the recovery of the preliminary pulse injection test was analysed.

During the brief injection phase of the pulse injection a of less than 1 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 253 kPa.

Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.8 \cdot 10^{-12}$ m³/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

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 horizontal stabilization, which is indicative for a flow dimension of 2 (radial flow). The analysis is presented in Appendix 2-72.

Selected representative parameters

The recommended transmissivity of $9.9 \cdot 10^{-11}$ m²/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-11}$ to $2.0 \cdot 10^{-10}$ m²/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.3.43 Section 504.00–509.00 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 between the test interval and the adjacent zones was observed. The injection rate decreased from 40 mL/min at start of the CHi phase to 22 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). Both phases show no problems and are adequate for quantitative analyse.

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 and a kind of horizontal stabilization at late times. This behaviour indicates a decrease of transmissivity at some distance from the borehole. A composite radial flow model was used for the analysis of the CHi phase. The response of the CHir derivative is similar to the response of the CHi derivative. The CHir phase was matched using a composite flow model with wellbore storage and skin was. The analysis is presented in Appendix 2-73.

Selected representative parameters

The recommended transmissivity of $1.6 \cdot 10^{-8}$ m²/s was derived from the analysis of the CHi phase (inner zone). The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-9}$ m²/s to $4.0 \cdot 10^{-8}$ 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 4,959.6 kPa.

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

6.3.44 Section 509.00–514.00 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 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.

During the CHi phase the flow rate dropped below 1 mL/min. Because of this the injection was stopped and no CHir phase was conducted. Instead, the recovery of the preliminary pulse injection test was analysed.

During the brief injection phase of the pulse injection of about 29 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 213 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $2.1 \cdot 10^{-11}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

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 horizontal stabilization, which is indicative for a flow dimension of 2 (radial flow). The unknown initial formation pressure, adds some uncertainties to the analysis and the late time derivative. The analysis is presented in Appendix 2-74.

Selected representative parameters

The recommended transmissivity of $1.9 \cdot 10^{-09}$ m^2/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-10}$ to $3.0 \cdot 10^{-09}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.3.45 Section 514.00–519.00 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, during the injection the flowrate dropped below 1 mL/min (measurement limit), indicating a very low formation transmissivity.

The measured data is presented in Appendix 2-75.

Selected representative parameters

Based on the test response the interval transmissivity is assumed to be $1.0 \cdot 10^{-10}$ m^2/s.

No further analysis recommended.

6.3.46 Section 519.00–524.00 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 relative fast 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 automatic regulation system functioned well. However, the recorded data is noisy. The injection rate decreased from 12 mL/min at start of the CHi phase to7 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). 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 trend. This behaviour is indicative for a decrease in transmissivity at some distance from the borehole. Due to the noise in the recorded data the CHi phase is not conclusive. However, a homogeneous radial flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a slight horizontal stabilization at middle times (inflexion) followed by an upward trend at late times, which is consistent with a decrease in transmissivity at some distance from the borehole. A two shell composite radial flow model with wellbore storage and skin was used for the analyses of the CHir phase. The analysis is presented in Appendix 2-76.

Selected representative parameters

The recommended transmissivity of $1.5 \cdot 10^{-8}$ 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 $8.0 \cdot 10^{-9}$ 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 straight line extrapolation in the Horner plot to a value of 5,102.5 kPa.

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

6.3.47 Section 524.00–529.00 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 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.

During the CHi phase the flow rate dropped below 1 mL/min. Because of this the injection was stopped and no CHir phase was conducted. Instead, the recovery of the preliminary pulse injection test was analysed.

During the brief injection phase of the pulse injection of about 3 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of 207 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.6 \cdot 10^{-11}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

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 horizontal stabilization at early and middle times, which is indicative for a flow dimension of 2 (radial flow). The unknown initial formation pressure, adds some uncertainties to the analysis and the late time derivative. The analysis is presented in Appendix 2-77.

Selected representative parameters

The recommended transmissivity of $6.1\cdot10^{-10}$ m²/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $1.0\cdot10^{-10}$ to $8.0\cdot10^{-10}$ m²/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.3.48 Section 529.00–534.00 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 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.

During the CHi phase the flow rate dropped below 1 mL/min. Because of this the injection was stopped and no CHir phase was conducted. Instead, the recovery of the preliminary pulse injection test was analysed.

During the brief injection phase of the pulse injection of about 4 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 $1.9\cdot10^{-11}$ m³/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

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 horizontal stabilization at early and middle times, which is indicative for a flow dimension of 2 (radial flow). A homogeneous radial flow model was used for the analysis. The analysis is presented in Appendix 2-78.

Selected representative parameters

The recommended transmissivity of $7.2\cdot10^{-10}$ m²/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be $1.0\cdot10^{-10}$ to $9.0\cdot10^{-10}$ m²/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.3.49 Section 534.00–539.00 m, test no. 1, injection

Comments to test

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

The CHi phase was conducted using a pressure difference of 201 kPa. No hydraulic connection to the adjacent zones was observed. The automatic regulation system functioned well. However, the recorded data is noisy. The injection rate decreased from 11 mL/min at start of the CHi phase to 9 ml/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). 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 very noisy does not allow for flow model identification. However, a homogeneous radial flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a downward trend at late times, indicating an increase of transmissivity at some distance from the borehole. A two shell composite flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-79.

Selected representative parameters

The recommended transmissivity of $8.8 \cdot 10^{-9}$ 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 $4.0 \cdot 10^{-9}$ 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 5,227.9 kPa.

The analyses of the CHi and CHir phases show some inconsistency as far as the flow model concerned. This is attributed to the poor data quality in the CHi phase. No further analysis is recommended.

6.3.50 Section 539.00–544.00 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 between the test interval and the adjacent zones was observed. The automatic regulation system worked well. However, the recorded data is noisy. The injection rate decreased from 0.5 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 fast recovery.

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 was matched using a homogeneous radial flow model. The early and middle time response of the derivative is not well known, but it shows formation flow stabilization at late times. A homogeneous flow model with wellbore storage and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-80.

Selected representative parameters

The recommended transmissivity of $1.6 \cdot 10^{-6}$ m²/s was derived from the analysis of the CHir phase, because of its horizontal derivative stabilization at late times. The confidence range for the interval transmissivity is estimated to be $7.0 \cdot 10^{-7}$ 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 5,278.3 kPa.

No further analysis is recommended.

6.3.51 Section 544.00–549.00 m, test no. 1, injection

Comments to test

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

The CHi phase was conducted using a pressure difference of 201 kPa. No hydraulic connection to the adjacent zones was observed. The automatic regulation system functioned well, with the exception of some oscillations at the start. However, the recorded data is a little bit noisy at middle and late times. The injection rate decreased from 100 mL/min at start of the CHi phase to 70 ml/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). 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. However, a homogeneous radial flow model was used for the analysis of the CHi phase. The derivative of the CHir phase shows a downward trend at late times, indicating an increase of transmissivity at some distance from the borehole. A two shell composite flow model with wellbore storage and skin was chosen for the analysis of the CHir phase. The analysis is presented in Appendix 2-81.

Selected representative parameters

The recommended transmissivity of $9.1 \cdot 10^{-8}$ 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 $6.0 \cdot 10^{-8}$ m²/s to $4.0 \cdot 10^{-7}$ 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 5,329.3 kPa.

The analyses of the CHi and CHir phases show some inconsistency as far as the flow model concerned. This may attributed to the noise in the recorded data of the CHi phase. No further analysis is recommended.

6.3.52 Section 549.00–554.00 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 automatic injection system functioned well. However, the recorded data is noisy. The injection rate decreased from 21 mL/min at start of the CHi phase to 12 mL/min at the end, indicating a low interval transmissivity (consistent with the pulse recovery). The CHir phase shows no problems and is adequate for quantitative analysis.

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 was matched using a homogeneous radial flow. The derivative of the CHir phase shows a downward trend at late times. A two shell composite radial flow model with increasing transmissivity away from the borehole was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-82.

Selected representative parameters

The recommended transmissivity of $9.8 \cdot 10^{-09}$ m^2/s was derived from the analysis of the CHir phase (outer phase). The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-09}$ m^2/s to $2.0 \cdot 10^{-08}$ m^2/s (this range includes the inner zone transmissivity of the CHir phase). 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 5,365.8 kPa.

The analyses of the CHi and CHir phases show consistency regarding the transmissivity. The inconsistency regarding the flow models may be attributed to the noise in the data of the CHi phase. No further analysis is recommended.

6.3.53 Section 554.00–559.00 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 CHi phase is not analysable, because the automatic regulation system was switching between two valves during the injection phase and no stable pressure condition in the section occurred. The arithmetic flow rate during the CHi phase was approx. 5 mL/min. 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 not analysable, due to poor pressure control during the injection. The CHir shows an upward trend at middle times, followed by a slight stabilization at late times. This is consistent with 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 of the CHir phase. The analysis is presented in Appendix 2-83.

Selected representative parameters

The recommended transmissivity of $1.9 \cdot 10^{-09}$ m^2/s was derived from the analysis of the CHir phase (outer phase). The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-10}$ m^2/s to $5.0 \cdot 10^{-09}$ 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 5,421.4 kPa.

No further analysis is recommended.

6.3.54 Section 559.00–564.00 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 zones was observed. The automatic injection system functioned well. However, the recorded data is noisy. The injection rate decreased from 1.3 L/min at start of the CHi phase to 0.8 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). 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 was matched using a homogeneous radial flow. The derivative of the CHir phase shows a horizontal stabilization at middle times, followed by a downward trend at late times, which is indicative with an increase of transmissivity at some distance from the borehole. A two shell composite radial flow model with increasing transmissivity away from the borehole was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-84.

Selected representative parameters

The recommended transmissivity of $4.6 \cdot 10^{-07}$ m^2/s was derived from the analysis of the CHir phase (inner phase), which shows the clearest derivative stabilization. The confidence range for the interval transmissivity is estimated to be $1.0 \cdot 10^{-07}$ m^2/s to $7.0 \cdot 10^{-07}$ 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 5,474.5 kPa.

The analyses of the CHi and CHir phases show consistency regarding the transmissivity. The inconsistency regarding the flow models may be attributed to the noise in the data of the CHi phase. No further analysis is recommended.

6.3.55 Section 564.00–569.00 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 automatic regulation system worked well. However, the recorded data is a little bit noisy. The injection rate decreased from 117 mL/min at start of the CHi phase to 103 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a fast recovery. 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 (although noisy) shows a relative flat derivative. A homogenous radial flow model was chosen for the analysis of the CHi phase. The derivative of the CHir phase shows a unit slope downward trend at middle times, indicating a high positive skin, followed by a kind of horizontal stabilization. A homogeneous flow model with wellbore storage and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-85.

Selected representative parameters

The recommended transmissivity of $1.5 \cdot 10^{-7}$ 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 $7.0 \cdot 10^{-8}$ m^2/s to $5.0 \cdot 10^{-7}$ 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 5,529.0 kPa.

The analyses of the CHi and CHir phases show good consistency, with the exception of the high positive skin derived from the CHir phase. This high positive skin may be attributed to non-Darcy flow effects in the formation. No further analysis is recommended.

6.3.56 Section 569.00–574.00 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. This phenomenon is caused by a combination of prolonged packer expansion and a very tight section (T probably smaller than 1E–11 m^2/s). 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 2-86.

Selected representative parameters

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

No further analysis recommended.

6.3.57 Section 574.00–579.00 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. 350 kPa in 10 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 2-87.

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.

6.3.58 Section 579.00–584.00 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 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.

During the CHi phase the flow rate dropped below 1 mL/min. Because of this the injection was stopped and no CHir phase was conducted. Instead, the recovery of the preliminary pulse injection test was analysed.

During the brief injection phase of the pulse injection of less than 1 mL was injected (derived from the flow meter readings). This injected volume produced a pressure increase of approx. 220 kPa. Using a dV/dP approach, the wellbore storage coefficient relevant for the subsequent pressure recovery can be calculated to $1.8 \cdot 10^{-12}$ m^3/Pa. It should be noted though that there is large uncertainty connected with the determination of the wellbore storage coefficient (probably one order of magnitude), which will implicitly translate into uncertainty in the derived transmissivity.

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, which is indicative for a decrease of transmissivity at some distance from the borehole. A two shell composite flow model was used for the analysis. The analysis is presented in Appendix 2-88.

Selected representative parameters

The recommended transmissivity of $1.4 \cdot 10^{-11}$ m^2/s was derived from the analysis of the Pi phase (outer zone). The confidence range for the interval transmissivity is estimated to be $9.0 \cdot 10^{-12}$ to $6.0 \cdot 10^{-11}$ m^2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

No further analysis is recommended.

6.3.59 Section 584.00–589.00 m, test no. 1, injection

Comments to test

The intention was to conduct the test as a constant pressure injection test phase (CHi), followed by a pressure recovery phase (CHir). However, after inflating the packers and closing the test valve, the pressure kept rising by approx. 200 kPa in 20 minutes. This phenomenon is caused by prolonged packer expansion in a very tight section (T probably smaller than 1E–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.

6.3.60 Section 589.00–594.00 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. The pressure in the bottom zone rose by approx. 30 kPa, indicating a connection to the test section. The automatic regulation system worked well. However, the recorded data is a noisy. The injection rate decreased from 1.5 L/min at start (some oscillations occurred until the system find the right settings) of the CHi phase to 1.4 L/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). 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 was matched using a homogenous radial flow model. The derivative of the CHir phase shows a slight stabilization at middle times, followed by downward trend at late times. This is consistent with an increase of transmissivity at some distance from the borehole. A two shell composite flow model with wellbore storage and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-90.

Selected representative parameters

The recommended transmissivity of $1.6 \cdot 10^{-6}$ 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 $8.0 \cdot 10^{-7}$ 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 5,766.7 kPa.

The analyses of the CHi and CHir phases show consistency regarding the transmissivity. The inconsistency regarding the flow models may be attributed to the noise in the data of the CHi phase. No further analysis is recommended.

6.3.61 Section 594.00–599.00 m, test no. 1, injection

Comments to test

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

The CHi phase was conducted using a pressure difference of 201 kPa. A slight reaction in the bottom zone was observed during the injection. The automatic regulation system worked well. However, the recorded data is noisy. The injection rate decreased from 200 mL/min at start of the CHi phase to 170 mL/min at the end, indicating a medium interval transmissivity (consistent with the pulse recovery). The CHir phase shows a fast recovery.

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 was matched using a homogeneous radial flow model. The early and middle time response of the derivative is not very conclusive, but it shows formation flow stabilization at late times. A homogeneous flow model with wellbore storage and skin was used for the analysis of the CHir phase. The analysis is presented in Appendix 2-91.

Selected representative parameters

The recommended transmissivity of $2.6 \cdot 10^{-7}$ m^2/s was derived from the analysis of the CHi phase, because of its horizontal derivative stabilization at late times. The confidence range for the interval transmissivity is estimated to be $8.0 \cdot 10^{-8}$ m^2/s to $5.0 \cdot 10^{-7}$ 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 5,817.6 kPa.

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

7 Synthesis

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

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

7.1 Summary of results

Table 7-1. General test data from hydraulic tests in KLX18A.

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
104.00	204.00	060815 10:44	060815 12:10	1.42E–04	1.53E–04	1,800	1,800	1,978	1,978	2,178	1,987	9.7	**CHi/CHir**
204.00	304.00	060815 14:05	060815 16:10	1.32E–06	1.57E–06	1,800	1,800	2,954	2,950	3,150	2,954	11.3	**CHi/CHir**
304.00	404.00	060815 17:25	060815 19:19	5.63E–05	6.00E–05	1,800	1,800	3,923	3,915	4,114	3,915	12.8	**CHi/CHir**
404.00	504.00	060815 21:08	060815 23:01	6.48E–05	6.93E–05	1,800	1,800	4,895	4,881	5,081	4,883	14.5	**CHi/CHir**
504.00	604.00	060816 07:34	060816 09:40	4.25E–05	1.67E–04	1,800	1,800	5,886	5,864	6,065	5,867	16.0	**CHi/CHir**
104.00	124.00	060816 19:58	060816 21:22	1.58E–04	1.67E–04	1,200	1,200	1,202	1,204	1,404	1,206	8.6	**CHi/CHir**
124.00	144.00	060816 22:02	060816 23:27	4.65E–05	4.82E–05	1,200	1,200	1,395	1,400	1,601	1,404	8.8	**CHi/CHir**
144.00	164.00	060816 23:59	060817 01:27	6.63E–06	7.48E–06	1,200	1,200	1,590	1,592	1,792	1,592	9.1	**CHi/CHir**
164.00	184.00	060817 06:38	060817 08:23	1.83E–07	2.15E–07	1,200	1,200	1,779	1,788	1,994	1,807	9.4	**CHi/CHir**
184.00	204.00	060817 09:06	060817 10:48	8.27E–08	1.10E–07	1,200	1,200	1,975	1,984	2,186	1,993	9.7	**CHi/CHir**
204.00	224.00	060817 11:27	060817 13:32	7.00E–08	9.03E–08	1,500	3,060	2,172	2,172	2,387	2,179	10.0	**CHi/CHir**
224.00	244.00	060817 14:08	060817 16:08	#NV	#NV	10	3,721	2,367	2,366	2,605	2,401	10.4	**Pi**
244.00	264.00	060817 16:43	060817 18:16	1.17E–06	1.40E–06	1,200	1,200	2,562	2,559	2,758	2,565	10.7	**CHi/CHir**
264.00	284.00	060817 18:46	060817 20:28	1.00E–07	1.33E–07	1,200	1,200	2,756	2,766	2,983	2,813	11.0	**CHi/CHir**
284.00	304.00	060817 21:22	060817 23:01	6.67E–08	8.33E–08	1,200	1,200	2,967	2,974	3,197	2,982	11.3	**CHi/CHir**
304.00	324.00	060817 23:30	060818 00:54	6.67E–07	7.17E–07	1,200	1,200	3,144	3,137	3,337	3,136	11.6	**CHi/CHir**
324.00	344.00	060818 01:24	060818 02:47	1.90E–05	1.98E–05	1,200	1,200	3,337	3,331	3,531	3,331	11.9	**CHi/CHir**
344.00	364.00	060818 06:29	060818 08:03	2.93E–05	1.67E–04	1,200	1,200	3,529	3,524	3,724	3,525	12.2	**CHi/CHir**
364.00	384.00	060818 08:34	060818 10:01	9.22E–06	9.52E–06	1,200	1,200	3,725	3,720	3,921	3,721	12.5	**CHi/CHir**
384.00	404.00	060818 10:38	060818 12:07	8.30E–06	8.85E–06	1,200	1,200	3,921	3,913	4,114	3,914	12.8	**CHi/CHir**
404.00	424.00	060818 13:16	060818 14:45	3.71E–05	3.83E–05	1,200	1,200	4,119	4,107	4,307	4,108	13.1	**CHi/CHir**
424.00	444.00	060818 15:16	060818 16:46	4.43E–05	4.65E–05	1,200	1,200	4,313	4,301	4,501	4,302	13.5	**CHi/CHir**
444.00	464.00	060818 17:20	060818 18:44	1.47E–06	1.55E–06	1,200	1,200	4,509	4,507	4,706	4,507	13.8	**CHi/CHir**
464.00	484.00	060818 19:19	060818 20:35	1.27E–06	1.37E–06	1,200	1,200	4,703	4,700	4,899	4,701	14.1	**CHi/CHir**
484.00	504.00	060819 00:45	060819 04:09	4.73E–07	9.24E–07	1,200	7,200	4,895	4,915	5,116	4,927	14.5	**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
504.00	524.00	060819 06:24	060819 08:12	4.70E–07	6.61E–07	1,200	1,200	5,086	5,092	5,292	5,127	14.8	**CHi/CHir**
524.00	544.00	060819 08:45	060819 10:16	5.53E–06	5.68E–06	1,200	1,200	5,280	5,279	5,480	5,280	15.0	**CHi/CHir**
544.00	564.00	060819 10:56	060819 12:36	1.19E–05	1.27E–05	1,200	1,200	5,477	5,479	5,679	5,480	15.4	**CHi/CHir**
564.00	584.00	060819 13:29	060819 14:56	1.43E–06	1.49E–06	1,200	1,200	5,676	5,674	5,874	5,674	15.7	**CHi/CHir**
584.00	604.00	060819 15:30	060819 16:51	2.33E–05	2.39E–05	1,200	1,200	5,872	5,869	6,069	5,870	16.0	**CHi/CHir**
299.00	304.00	060820 08:53	060820 10:28	2.50E–08	2.53E–08	1,200	1,200	2,947	2,945	3,170	2,946	11.2	**CHi/CHir**
304.00	309.00	060820 10:58	060820 12:56	#NV	#NV	10	4,140	2,996	3,006	3,234	3,195	11.3	**Pi**
309.00	314.00	060820 13:33	060820 15:04	3.33E–08	3.77E–08	1,200	1,200	3,046	3,042	3,273	3,043	11.4	**CHi/CHir**
314.00	319.00	060820 15:29	060820 16:27	#NV	#NV	#NV	#NV	3,096	#NV	#NV	#NV	11.5	**Pi**
319.00	324.00	060820 16:52	060820 18:12	6.00E–07	6.17E–07	1,200	1,200	3,145	3,140	3,339	3,139	11.6	**CHi/CHir**
324.00	329.00	060820 18:35	060820 19:31	#NV	#NV	#NV	#NV	3,194	#NV	#NV	#NV	11.7	**#NV**
329.00	334.00	060820 19:53	060820 21:14	5.00E–06	5.28E–06	1,200	1,200	3,242	3,236	3,437	3,236	11.8	**CHi/CHir**
334.00	339.00	060820 21:58	060820 23:46	9.33E–06	9.62E–06	1,200	1,200	3,290	3,284	3,484	3,282	11.9	**CHi/CHir**
339.00	344.00	060821 00:08	060821 01:31	4.33E–06	4.67E–06	1,200	1,200	3,338	3,332	3,533	3,332	11.9	**CHi/CHir**
344.00	349.00	060821 01:55	060821 03:24	2.21E–05	2.28E–05	1,200	1,200	3,386	3,381	3,581	3,381	12.0	**CHi/CHir**
349.00	354.00	060821 06:23	060821 08:08	4.32E–07	4.33E–07	1,200	1,200	3,433	3,428	3,601	3,428	12.1	**CHi/CHir**
354.00	359.00	060821 08:44	060821 10:08	#NV	#NV	10	2,714	3,491	3,489	3,707	3,538	12.2	**Pi**
359.00	364.00	060821 10:37	060821 12:02	7.98E–06	8.23E–06	1,200	1,200	3,531	3,527	3,728	3,527	12.2	**CHi/CHir**
364.00	369.00	060821 13:02	060821 14:22	7.75E–06	7.88E–06	1,200	1,200	3,581	3,574	3,775	3,575	12.3	**CHi/CHir**
369.00	374.00	060821 15:02	060821 16:20	3.50E–06	3.58E–06	1,200	1,200	3,629	3,630	3,831	3,630	12.4	**CHi/CHir**
374.00	379.00	060821 16:42	060821 18:05	2.33E–06	2.50E–06	1,200	1,200	3,679	3,675	3,875	3,675	12.5	**CHi/CHir**
379.00	384.00	060821 18:28	060821 19:48	1.28E–06	1.35E–06	1,200	1,200	3,727	3,723	3,922	3,723	12.6	**CHi/CHir**
384.00	389.00	060821 20:20	060821 21:41	2.00E–06	2.12E–06	1,200	1,200	3,776	3,772	3,971	3,768	12.6	**CHi/CHir**
389.00	394.00	060821 22:03	060821 23:33	5.67E–08	7.50E–08	1,200	1,200	3,823	3,820	4,052	3,818	12.7	**CHi/CHir**
394.00	399.00	060821 23:59	060822 01:29	2.50E–07	2.71E–07	1,200	1,200	3,870	3,868	4,068	3,867	12.8	**CHi/CHir**
399.00	404.00	060822 06:19	060822 07:37	6.28E–06	6.66E–06	1,200	1,200	3,918	3,909	4,109	3,908	12.8	**CHi/CHir**
404.00	409.00	060822 08:10	060822 09:32	4.55E–07	5.15E–07	1,200	1,200	3,970	3,958	4,181	3,958	12.9	**CHi/CHir**
409.00	414.00	060822 10:09	060822 11:36	6.50E–07	7.12E–07	1,200	1,200	4,016	4,008	4,209	4,008	13.0	**CHi/CHir**

Borehole secup (m)	Borehole seclow (m)	Date and time for test, start YYYYMMDD hh:mm	Date and time for test, stop YYYYMMDD hh:mm	Q_p (m^3/s)	Q_m (m^3/s)	t_p (s)	t_F (s)	p_0 (kPa)	p_i (kPa)	p_p (kPa)	p_F (kPa)	Te_w (°C)	Test phases measured Analysed test phases marked bold
414.00	419.00	060822 14:07	060822 15:25	4.12E–06	4.21E–06	1,200	1,200	4,069	4,057	4,257	4,057	13.1	**CHi/CHir**
419.00	424.00	060822 15:59	060822 17:19	3.32E–05	3.38E–05	1,200	1,200	4,115	4,105	4,306	4,106	13.1	**CHi/CHir**
424.00	429.00	060822 17:42	060822 19:08	2.37E–05	2.50E–05	1,200	1,200	4,165	4,153	4,353	4,153	13.2	**CHi/CHir**
429.00	434.00	060822 19:32	060822 20:54	2.35E–05	2.40E–05	1,200	1,200	4,214	4,202	4,402	4,202	13.3	**CHi/CHir**
434.00	439.00	060822 21:24	060822 22:46	6.50E–07	6.83E–07	1,200	1,200	4,262	4,256	4,455	4,254	13.4	**CHi/CHir**
439.00	444.00	060822 23:10	060823 00:35	#NV	#NV	10	2,697	4,308	4,330	4,541	4,445	13.5	**Pi**
444.00	449.00	060823 01:02	060823 03:40	#NV	#NV	10	7,234	4,356	4,371	4,573	4,416	13.6	**Pi**
449.00	454.00	060823 06:23	060823 08:04	2.63E–08	3.36E–08	1,200	1,200	4,403	4,413	4,630	4,439	13.7	**CHi/CHir**
454.00	459.00	060823 08:37	060823 10:04	1.51E–06	1.61E–06	1,200	1,200	4,453	4,451	4,652	4,454	13.7	**CHi/CHir**
459.00	464.00	060823 10:41	060823 12:04	1.67E–08	2.10E–08	1,200	1,200	4,507	4,541	4,763	4,545	13.8	**CHi/CHir**
464.00	469.00	060823 13:31	060823 15:05	2.67E–06	3.10E–08	1,200	1,200	4,553	4,558	4,812	4,564	13.9	**CHi/CHir**
469.00	474.00	060823 16:36	060823 17:54	3.00E–07	3.08E–07	1,200	1,200	4,602	4,602	4,802	4,601	14.0	**CHi/CHir**
474.00	479.00	060823 18:19	060823 19:37	1.33E–06	1.45E–06	1,200	1,200	4,652	4,652	4,851	4,651	14.1	**CHi/CHir**
477.00	482.00	060823 20:08	060823 21:32	1.83E–07	2.00E–07	1,200	1,200	4,680	4,679	4,880	4,679	14.1	**CHi/CHir**
482.00	487.00	060823 21:55	060823 23:32	9.33E–07	1.12E–06	1,200	1,200	4,728	4,733	4,931	4,679	14.2	**CHi/CHir**
487.00	492.00	060823 23:55	060824 01:21	5.47E–07	6.22E–07	1,200	1,200	4,774	4,773	4,974	4,772	14.3	**CHi/CHir**
489.00	494.00	060824 06:23	060824 07:59	7.32E–07	7.87E–07	1,200	1,200	4,791	4,792	4,992	4,794	14.3	**CHi/CHir**
494.00	499.00	060824 08:48	060824 10:28	7.17E–08	8.93E–08	1,200	1,200	4,841	4,851	5,052	4,878	14.4	**CHi/CHir**
499.00	504.00	060824 11:04	060824 12:08	#NV	#NV	10	678	4,893	4,899	5,153	4,898	14.5	**Pi**
504.00	509.00	060824 14:09	060824 16:21	3.67E–07	4.37E–07	1,200	1,200	4,967	4,966	5,168	4,998	14.5	**CHi/CHir**
509.00	514.00	060824 16:44	060824 17:40	#NV	#NV	10	696	4,995	5,027	5,240	5,030	14.6	**Pi**
514.00	519.00	060824 18:02	060824 18:57	#NV	#NV	#NV	#NV	5,043	#NV	#NV	#NV	14.7	**#NV**
519.00	524.00	060824 19:21	060824 20:43	1.17E–07	1.43E–07	1,200	1,200	5,092	5,098	5,298	5,125	14.8	**CHi/CHir**
524.00	529.00	060824 21:09	060824 22:14	#NV	#NV	10	1,262	5,138	5,149	5,356	5,152	14.8	**Pi**
529.00	534.00	060824 22:37	060824 23:43	#NV	#NV	10	1,272	5,185	5,192	5,401	5,194	14.9	**Pi**
534.00	539.00	060825 00:07	060825 01:32	1.62E–07	1.80E–07	1,200	1,200	5,232	5,233	5,434	5,232	15.0	**CHi/CHir**
539.00	544.00	060825 06:09	060825 07:44	7.20E–06	7.37E–06	1,200	1,200	5,286	5,278	5,478	5,278	15.1	**CHi/CHir**
544.00	549.00	060825 08:29	060825 09:59	1.13E–06	1.17E–06	1,200	1,200	5,328	5,329	5,530	5,330	15.1	**CHi/CHir**

Borehole secup (m)	Borehole seclow (m)	Date and time for test, start YYYYMMDD hh:mm	Date and time for test, stop YYYYMMDD hh:mm	Q_p (m^3/s)	Q_m (m^3/s)	t_p (s)	t_F (s)	p_0 (kPa)	p_i (kPa)	p_p (kPa)	p_F (kPa)	Te_w (°C)	Test phases measured Analysed test phases marked bold
549.00	554.00	060825 10:32	060825 12:27	2.00E–07	2.53E–07	1,200	1,200	5,380	5,388	5,589	5,398	15.2	**CHi/CHir**
554.00	559.00	060825 13:24	060825 15:03	7.50E–08	8.33E–08	1,200	1,200	5,447	5,437	5,633	5,438	15.3	CHi/**CHir**
559.00	564.00	060825 15:36	060825 16:54	1.27E–05	1.32E–05	1,200	1,200	5,490	5,481	5,683	5,482	15.3	**CHi/CHir**
564.00	569.00	060825 17:19	060825 18:40	1.72E–06	1.78E–06	1,200	1,200	5,531	5,530	5,730	5,528	15.4	**CHi/CHir**
569.00	574.00	060825 19:04	060825 21:13	#NV	#NV	#NV	#NV	5,581	#NV	#NV	#NV	15.5	**#NV**
574.00	579.00	060825 21:36	060825 22:15	#NV	#NV	#NV	#NV	5,627	#NV	#NV	#NV	15.6	**#NV**
579.00	584.00	060825 22:38	060825 23:58	#NV	#NV	10	2,025	5,673	5,737	5,894	5,688	15.6	**Pi**
584.00	589.00	060826 00:20	060826 01:08	#NV	#NV	#NV	#NV	5,719	#NV	#NV	#NV	15.7	**#NV**
589.00	594.00	060826 06:16	060826 07:46	2.35E–05	2.43E–05	1,200	1,200	5,776	5,766	5,966	5,767	15.7	**CHi/CHir**
594.00	599.00	060826 08:29	060826 09:53	2.80E–06	2.95E–06	1,200	1,200	5,822	5,818	6,019	5,818	15.9	**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 7-2. Results from analysis of hydraulic tests in KLX18A.

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} masl
104.00	204.00	6.98E–06	9.09E–06	22	WBS2	7.8E–06	1.2E–05	6.0E–06	1.1E–05	7.8E–06	5.0E–06	1.0E–05	4.8E–09	–1.3	0.90	3.00	1,983.6	12.22
204.00	304.00	6.62E–08	8.61E–08	22	WBS22	1.5E–08	5.0E–08	1.7E–08	6.7E–08	1.5E–08	8.0E–09	3.0E–08	1.5E–10	–3.8	6.00	18.00	2,938.0	10.99
304.00	404.00	2.78E–06	3.62E–06	2	WBS2	5.1E–06	#NV	1.5E–05	#NV	5.1E–06	2.0E–06	8.0E–06	9.6E–10	3.1	0.60	18.00	3,915.6	12.26
404.00	504.00	3.18E–06	4.12E–06	2	WBS2	6.1E–06	#NV	1.2E–05	#NV	6.1E–06	2.0E–06	9.0E–06	2.1E–09	3.7	1.80	18.00	4,880.5	12.28
504.00	604.00	2.07E–06	2.70E–06	22	WBS22	1.9E–06	4.6E–06	2.7E–06	8.97E–06	2.7E–06	9.0E–07	5.0E–06	1.6E–09	0.9	0.33	1.80	5,864.1	14.30
104.00	124.00	7.75E–06	8.11E–06	22	WBS22	8.1E–06	1.6E–05	1.0E–05	2.1E–05	8.1E–06	6.0E–06	2.0E–05	5.3E–09	–1.3	0.36	2.10	1,203.3	11.55
124.00	144.00	2.27E–06	2.37E–06	2	WBS2	5.1E–06	#NV	1.0E–05	#NV	5.1E–06	2.0E–06	8.0E–06	1.6E–09	5.8	0.33	18.00	1,402.9	12.17
144.00	164.00	3.25E–07	3.40E–07	22	WBS2	2.5E–07	3.1E–07	6.3E–07	1.05E–06	2.5E–07	9.0E–08	5.0E–07	3.9E–11	–1.8	0.39	5.40	1,590.5	11.58
164.00	184.00	8.73E–09	9.13E–09	2	WBS2	5.8E–09	#NV	8.2E–09	#NV	8.2E–09	5.0E–09	1.0E–08	5.6E–11	0.3	1.80	9.00	1,792.0	12.40
184.00	204.00	4.01E–09	4.20E–09	2	WBS2	2.3E–09	#NV	3.4E–09	#NV	3.4E–09	1.0E–09	6.0E–09	8.2E–11	0.1	5.40	12.00	1,963.3	10.15
204.00	224.00	3.19E–09	3.34E–09	2	WBS2	1.9E–09	#NV	6.4E–09	#NV	6.4E–09	2.0E–09	9.0E–09	6.8E–11	4.8	5.40	15.00	2,168.7	11.37
224.00	244.00	#NV	#NV	#NV	WBS2	#NV	#NV	9.3E–11	#NV	9.3E–11	6.0E–11	2.0E–10	7.9E–11	–2.4	0.54	33.00	#NV	#NV
244.00	264.00	5.75E–08	6.02E–08	22	WBS22	1.8E–08	5.5E–08	4.3E–08	1.9E–08	1.8E–08	9.0E–09	6.0E–08	6.6E–12	–3.2	0.28	2.40	2,543.4	10.16
264.00	284.00	4.52E–09	4.73E–09	22	WBS22	4.9E–09	1.7E–09	6.9E–09	9.1E–10	6.9E–09	3.0E–09	9.0E–09	6.0E–11	–0.9	0.24	1.20	2,750.4	11.56
284.00	304.00	2.93E–09	3.07E–09	2	WBS2	1.6E–09	#NV	3.7E–09	#NV	3.7E–09	9.0E–10	6.0E–09	6.4E–11	2.5	1.50	9.00	2,938.4	11.03
304.00	324.00	8.17E–06	8.54E–06	2	WBS2	7.5E–08	#NV	2.1E–07	#NV	2.1E–07	8.0E–08	5.0E–07	5.2E–11	32.5	1.20	7.20	3,135.0	11.39
324.00	344.00	9.32E–07	9.75E–07	2	WBS2	1.7E–06	#NV	1.7E–06	5.7E–06	5.7E–06	2.0E–06	9.0E–06	1.9E–10	2.0	0.60	9.00	3,330.2	11.62
344.00	364.00	1.44E–06	1.51E–06	2	WBS2	3.4E–06	#NV	9.3E–06	#NV	9.3E–06	3.0E–06	3.0E–05	1.7E–10	7.7	0.15	9.00	3,524.4	11.73
364.00	384.00	4.50E–07	4.71E–07	2	WBS2	1.1E–06	#NV	2.1E–06	#NV	2.1E–06	9.0E–07	5.0E–06	2.2E–10	20.3	0.60	9.00	3,720.6	12.06
384.00	404.00	4.05E–07	4.24E–07	2	WBS2	1.0E–06	#NV	1.9E–06	#NV	1.9E–06	8.0E–07	4.0E–06	1.2E–10	20.6	0.36	9.00	3,913.3	12.03
404.00	424.00	1.82E–06	1.90E–06	2	WBS22	4.4E–06	#NV	2.2E–06	7.3E–06	7.3E–06	2.0E–06	1.0E–05	5.4E–10	1.2	0.78	9.00	4,107.1	12.12
424.00	444.00	2.17E–06	2.27E–06	2	WBS2	4.4E–06	#NV	9.9E–06	#NV	9.9E–06	4.0E–06	3.0E–05	4.4E–10	19.9	0.30	9.00	4,300.9	12.21
444.00	464.00	7.23E–08	7.56E–08	2	WBS2	1.1E–07	#NV	6.5E–08	#NV	6.5E–08	3.0E–08	9.0E–08	1.3E–10	–0.2	1.50	7.20	4,494.7	12.28
464.00	484.00	6.24E–08	6.53E–08	2	WBS2	7.3E–08	#NV	1.1E–07	#NV	1.1E–07	7.0E–08	3.0E–07	6.6E–11	4.8	1.02	9.00	4,695.3	13.07
484.00	504.00	2.31E–08	2.41E–08	2	WBS2	1.2E–09	#NV	1.6E–09	#NV	1.6E–09	9.0E–10	5.0E–09	1.6E–09	–4.3	33.00	108.00	4,895.4	13.80
504.00	524.00	2.31E–08	2.41E–08	2	WBS2	9.9E–09	#NV	1.7E–08	#NV	1.7E–08	8.0E–09	4.0E–08	4.8E–10	–2.0	3.30	10.20	5,096.4	14.63

Interval position		Stationary flow parameters		Transient analysis													Static conditions	
				Flow regime		Formation parameters												
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} masl
524.00	544.00	2.70E–07	2.83E–07	2	WBS2	6.8E–07	#NV	1.3E–06	#NV	6.8E–07	1.0E–07	1.0E–06	6.4E–11	8.4	0.57	18.00	5,279.7	13.66
544.00	564.00	5.85E–07	6.11E–07	22	WBS22	3.8E–07	1.9E–06	5.5E–07	2.7E–06	5.5E–07	1.0E–07	9.0E–07	1.0E–09	–2.2	0.27	3.30	5,477.6	14.18
564.00	584.00	7.02E–08	7.35E–08	2	WBS2	1.2E–07	#NV	4.4E–07	#NV	4.4E–07	1.0E–07	8.0E–07	8.8E–11	32.3	1.02	7.80	5,673.7	14.53
584.00	604.00	1.14E–06	1.20E–06	2	WBS2	2.0E–06	#NV	1.6E–06	1.1E–05	1.6E–06	8.0E–07	3.0E–06	3.4E–10	3.8	0.18	1.02	5,869.7	14.87
299.00	304.00	1.09E–09	9.00E–10	2	WBS2	8.0E–10	#NV	6.5E–09	#NV	6.5E–09	1.0E–09	1.0E–08	1.0E–11	33.3	6.00	9.00	2,942.8	11.48
304.00	309.00	#NV	#NV	#NV	#NV	#NV	#NV	1.3E–11	9.1E–13	1.3E–11	2.0E–12	3.0E–11	1.5E–11	–0.95	0.70	10.20	#NV	#NV
309.00	314.00	1.42E–09	1.17E–09	2	WBS2	1.0E–09	#NV	9.7E–09	#NV	9.7E–09	6.0E–09	4.0E–08	1.3E–11	33.2	3.00	9.00	3,037.7	11.31
314.00	319.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
319.00	324.00	2.96E–08	2.44E–08	2	WBS2	7.8E–08	#NV	7.3E–08	#NV	7.3E–08	4.0E–08	2.0E–07	2.1E–11	9.7	0.90	9.00	3,138.9	11.79
324.00	329.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
329.00	334.00	2.44E–07	2.01E–07	2	WBS2	4.1E–07	#NV	1.6E–06	1.1E–05	4.1E–07	1.0E–07	7.0E–07	3.2E–10	3.6	0.40	18.00	3,234.0	11.65
334.00	339.00	4.58E–07	3.78E–07	2	WBS22	1.5E–06	#NV	1.4E–06	7.0E–06	7.0E–06	1.0E–06	1.0E–05	3.8E–11	15.4	0.12	9.00	3,283.3	11.75
339.00	344.00	2.11E–07	1.75E–07	2	WBS2	6.6E–07	3.2E–07	1.0E–06	#NV	3.2E–07	9.0E–08	6.0E–07	5.7E–11	11.3	4.20	18.00	3,332.1	11.80
344.00	349.00	1.08E–06	8.93E–07	2	WBS2	2.3E–06	#NV	5.1E–06	#NV	2.3E–06	8.0E–07	6.0E–06	1.3E–10	5.7	0.40	18.00	3,380.4	11.81
349.00	354.00	2.5E–08	2.0E–08	2	WBS2	2.9E–08	#NV	1.0E–07	#NV	1.0E–07	5.0E–08	5.0E–07	1.5E–11	1.91	0.60	9.00	3,428.1	11.76
354.00	359.00	#NV	#NV	#NV	WBS22	#NV	#NV	2.0E–09	7.9E–10	7.9E–10	3.0E–10	9.0E–10	#NV	–0.12	1.80	33.00	#NV	#NV
359.00	364.00	3.9E–07	3.2E–07	2	WBS2	1.2E–06	#NV	2.6E–06	#NV	1.2E–06	7.0E–07	6.0E–06	2.9E–11	32.8	0.70	15.00	3,527.2	12.01
364.00	369.00	3.8E–07	3.1E–07	2	WBS2	9.2E–07	#NV	1.3E–06	#NV	1.3E–06	7.0E–07	3.0E–06	5.8E–11	8.2	0.20	9.00	3,573.6	11.83
369.00	374.00	1.7E–07	1.4E–07	2	WBS2	4.2E–07	#NV	7.8E–07	#NV	4.2E–07	3.0E–07	1.0E–06	3.7E–11	9.1	0.20	9.00	3,630.7	12.73
374.00	379.00	1.1E–07	9.5E–08	2	WBS2	2.9E–07	1.5E–07	5.3E–07	#NV	1.5E–07	7.0E–08	3.0E–07	1.6E–11	8.5	7.20	18.00	3,675.2	12.38
379.00	384.00	6.33E–08	5.22E–08	2	WBS2	1.4E–07	#NV	2.9E–07	#NV	2.9E–07	9.0E–08	5.0E–07	2.2E–11	21.4	0.40	9.00	3,721.3	12.13
384.00	389.00	9.9E–08	8.1E–08	2	WBS2	1.6E–07	#NV	4.5E–07	#NV	4.5E–07	1.0E–07	9.0E–07	2.7E–11	21.3	0.40	9.00	3,769.1	12.09
389.00	394.00	2.40E–09	1.98E–09	22	WBS22	2.0E–09	8.6E–10	1.3E–08	#NV	1.97E–09	9.0E–10	1.0E–08	1.46E–11	–0.1	0.18	1.80	3,817.3	12.08
394.00	399.00	1.23E–08	1.01E–08	22	WBS2	8.67E–09	#NV	5.5E–08	#NV	5.5E–08	1.0E–08	8.0E–08	2.0E–11	21.5	1.80	9.00	3,865.8	12.10
399.00	404.00	3.1E–07	2.5E–07	22	WBS2	7.0E–07	3.5E–07	1.4E–06	#NV	7.0E–07	3.0E–07	1.0E–06	3.1E–11	6.6	0.30	2.40	3,908.0	11.49
404.00	409.00	2.0E–08	1.7E–08	22	WBS2	2.9E–08	1.4E–08	1.4E–07	#NV	2.9E–08	9.0E–09	5.0E–08	2.8E–11	2.6	0.30	1.80	3,957.7	11.64
409.00	414.00	3.17E–08	2.62E–08	22	WBS2	8.03E–08	3.2E–08	1.5E–07	#NV	8.03E–08	5.0E–08	1.0E–07	1.1E–11	8.2	0.20	1.80	4,006.8	11.73

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} masl
414.00	419.00	2.0E–07	1.7E–07	2	WBS2	5.7E–07	#NV	8.8E–07	#NV	8.8E–07	4.0E–07	2.0E–06	5.6E–11	21.0	0.50	9.00	4,055.8	11.80
419.00	424.00	1.6E–06	1.3E–06	2	WBS2	4.0E–06	#NV	7.2E–06	#NV	7.2E–06	3.0E–06	1.0E–05	6.1E–10	19.8	0.50	9.00	4,105.4	11.94
424.00	429.00	1.2E–06	9.6E–07	22	WBS2	3.4E–06	1.7E–06	7.6E–06	#NV	3.39E–06	5.0E–07	7.0E–06	1.9E–10	9.7	0.40	2.40	4,153.3	11.91
429.00	434.00	1.2E–06	9.5E–07	2	WBS2	2.1E–06	#NV	5.2E–06	#NV	5.2E–06	8.0E–07	9.0E–06	3.2E–10	20.1	0.60	9.00	4,200.4	11.79
434.00	439.00	3.2E–08	2.6E–08	2	WBS22	5.8E–08	#NV	2.6E–08	8.5E–08	2.6E–08	9.0E–09	6.0E–08	1.9E–11	0.8	0.30	0.90	4,250.3	11.96
439.00	444.00	#NV	#NV	#NV	WBS22	#NV	#NV	6.2E–11	1.03E–11	6.16E–11	1.0E–11	9.0E–11	1.8E–11	5.1	0.30	1.80	#NV	#NV
444.00	449.00	#NV	#NV	#NV	WBS2	#NV	#NV	1.0E–11	#NV	1.0E–11	7.0E–12	3.0E–11	9.9E–12	0.2	0.10	42.00	#NV	#NV
449.00	454.00	1.2E–09	9.8E–10	2	WBS2	3.7E–10	#NV	4.2E–10	#NV	4.2E–10	1.0E–10	7.0E–10	1.5E–11	–1.4	0.60	9.00	4,393.1	11.77
454.00	459.00	7.4E–08	6.1E–08	22	WBS2	8.9E–08	1.3E–07	6.5E–08	9.2E–08	6.5E–08	3.0E–08	1.0E–07	9.8E–11	0.0	0.40	1.80	4,445.1	12.15
459.00	464.00	7.4E–10	6.1E–10	2	WBS2	9.0E–11	#NV	3.5E–10	#NV	3.5E–10	9.0E–11	6.0E–10	1.5E–11	–0.2	0.50	9.00	4,492.0	12.01
464.00	469.00	1.03E–09	8.50E–10	2	WBS2	7.3E–10	#NV	7.6E–10	#NV	7.6E–10	4.0E–10	2.0E–09	9.1E–12	1.2	1.80	9.00	4,538.1	11.79
469.00	474.00	1.5E–08	1.2E–08	2	WBS2	2.2E–08	#NV	6.4E–08	#NV	6.4E–08	1.0E–08	9.0E–08	1.4E–11	21.7	1.20	9.00	4,599.8	13.17
474.00	479.00	6.57E–08	5.43E–08	2	WBS2	9.9E–08	#NV	1.8E–07	#NV	9.9E–08	7.0E–08	3.0E–07	2.8E–11	3.1	0.48	18.00	4,647.4	13.10
477.00	482.00	8.95E–09	7.39E–09	2	WBS2	1.5E–08	#NV	3.2E–08	#NV	3.2E–08	7.0E–09	7.0E–08	1.8E–11	15.8	1.80	9.00	4,676.0	13.07
482.00	487.00	4.6E–08	3.8E–08	22	WBS22	4.0E–08	2.6E–08	9.6E–09	5.4E–09	2.6E–08	7.0E–09	5.0E–08	7.7E–10	–0.9	4.20	18.00	4,711.5	11.77
487.00	492.00	2.7E–08	2.2E–08	22	WBS2	4.4E–08	2.0E–08	1.3E–07	#NV	4.4E–08	1.0E–08	9.0E–08	1.3E–11	3.7	0.40	1.80	4,772.5	13.07
489.00	494.00	3.6E–08	3.0E–08	22	WBS22	2.9E–08	5.7E–08	2.5E–08	6.2E–08	2.5E–08	9.0E–09	4.0E–08	4.5E–11	–0.8	0.50	2.40	4,790.3	12.92
494.00	499.00	3.5E–09	2.9E–09	2	WBS2	1.5E–09	#NV	3.5E–09	#NV	3.5E–09	1.0E–09	5.0E–09	4.2E–11	0.4	2.40	9.00	4,857.9	14.89
499.00	504.00	#NV	#NV	#NV	#NV	#NV	#NV	9.93E–11	#NV	9.9E–11	7.0E–11	2.0E–10	1.8E–12	1.8	0.20	10.20	#NV	#NV
504.00	509.00	1.78E–08	1.47E–08	22	WBS22	1.6E–08	9.9E–09	1.3E–08	6.3E–09	1.6E–08	8.0E–09	4.0E–08	1.8E–10	–0.1	0.60	2.40	4,959.5	15.41
509.00	514.00	#NV	#NV	#NV	#NV	#NV	#NV	1.89E–09	#NV	1.9E–09	1.0E–10	3.0E–09	2.1E–11	2.1	0.20	9.00	#NV	#NV
514.00	519.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–10	1.0E–11	8.0E–10	#NV	#NV	#NV	#NV	#NV	#NV
519.00	524.00	5.72E–09	4.72E–09	2	WBS22	1.1E–08	2.7E–09	1.5E–08	3.0E–09	1.5E–08	8.0E–09	4.0E–08	1.7E–11	5.5	0.90	3.00	5,102.5	15.25
524.00	529.00	#NV	#NV	#NV	#NV	#NV	#NV	6.11E–10	#NV	6.1E–10	1.0E–10	8.0E–10	1.6E–11	3.2	0.20	9.00	#NV	#NV
529.00	534.00	#NV	#NV	#NV	#NV	#NV	#NV	7.24E–10	#NV	7.2E–10	1.0E–10	9.0E–10	1.9E–11	3.4	0.10	18.00	#NV	#NV
534.00	539.00	7.89E–09	6.51E–09	2	WBS22	6.6E–09	#NV	8.8E–09	2.9E–08	8.8E–09	4.0E–09	3.0E–08	1.5E–11	2.06	0.60	2.40	5,227.9	13.29
539.00	544.00	3.53E–07	2.92E–07	2	WBS2	9.0E–07	#NV	1.6E–06	#NV	1.6E–06	7.0E–07	3.0E–06	6.0E–11	20.9	0.20	9.00	5,278.3	13.52
544.00	549.00	5.53E–08	4.57E–08	2	WBS22	1.3E–07	#NV	9.1E–08	3.6E–07	9.1E–08	6.0E–08	4.0E–07	4.0E–11	5.0	0.30	1.20	5,329.3	13.80

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} masl
549.00	554.00	9.8E–09	8.1E–09	2	WBS22	5.2E–09	#NV	2.0E–09	9.8E–09	9.8E–09	1.0E–09	2.0E–08	9.4E–11	–2.9	6.00	9.00	5,365.8	12.61
554.00	559.00	3.8E–09	3.1E–09	#NV	WBS22	#NV	#NV	1.2E–08	1.9E–09	1.9E–09	8.0E–10	5.0E–09	4.3E–12	2.7	0.90	3.60	5,421.4	13.36
559.00	564.00	6.15E–07	5.08E–07	22	WBS2	5.9E–07	#NV	4.6E–07	1.4E–06	4.6E–07	1.0E–07	7.0E–07	2.7E–10	–1.7	0.20	2.40	5,474.5	13.87
564.00	569.00	8.42E–08	6.95E–08	2	WBS2	1.5E–07	#NV	5.4E–07	#NV	1.5E–07	7.0E–08	5.0E–07	5.3E–11	5.1	0.50	18.00	5,529.0	14.51
569.00	574.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
574.00	579.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
579.00	584.00	#NV	#NV	#NV	#NV	#NV	#NV	3.92E–11	1.41E–11	1.4E–11	9.0E–12	6.0E–11	1.8E–12	2.6	4.20	18.00	#NV	#NV
584.00	589.00	#NV	#NV	#NV	#NV	#NV	#NV	#NV	#NV	1.0E–11	1.0E–13	1.0E–11	#NV	#NV	#NV	#NV	#NV	#NV
589.00	594.00	1.2E–06	9.5E–07	2	WBS22	2.9E–06	#NV	1.6E–06	7.8E–06	1.6E–06	8.0E–07	5.0E–06	3.3E–10	1.7	0.20	0.70	5,766.7	14.18
594.00	599.00	1.4E–07	1.1E–07	2	WBS2	2.6E–07	#NV	6.1E–07	#NV	2.6E–07	8.0E–08	5.0E–07	3.3E–11	5.7	0.70	15.00	5,817.6	14.46

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} Freshwater head (based on transducer depth and p*)
#NV Not analysed/no values

Table 7-3. Results from the ri-index calculation of hydraulic tests in KLX18A (see Section 5.5.5 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)
104.00	204.00	7.80E–06	180	–1	50.65
204.00	304.00	1.49E–08	1,080	–1	25.94
304.00	404.00	5.09E–06	1,800	0	143.96
404.00	504.00	6.14E–06	1,800	0	150.87
504.00	604.00	2.69E–06	108	–1	30.07
104.00	124.00	8.12E–06	126	–1	42.80
124.00	144.00	5.05E–06	1,200	0	117.31
144.00	164.00	2.49E–07	324	–1	28.72
164.00	184.00	8.16E–09	1,200	0	23.52
184.00	204.00	3.43E–09	1,200	0	18.94
204.00	224.00	6.35E–09	3,060	0	35.27
224.00	244.00	9.29E–11	3,721	0	13.53
244.00	264.00	1.76E–08	144	0	9.87
264.00	284.00	6.89E–09	72	1	5.52
284.00	304.00	3.65E–09	1,200	–1	19.23
304.00	324.00	2.12E–07	1,200	0	53.10
324.00	344.00	5.67E–06	36	0	15.54
344.00	364.00	9.34E–06	1,200	0	136.80
364.00	384.00	2.06E–06	1,200	0	93.75
384.00	404.00	1.87E–06	1,200	0	91.51
404.00	424.00	7.31E–06	46.8	0	18.88
424.00	444.00	9.86E–06	1,200	0	138.67
444.00	464.00	6.48E–08	1,200	0	39.48
464.00	484.00	1.12E–07	1,200	0	45.27
484.00	504.00	1.61E–09	7,200	1	38.40
504.00	524.00	1.69E–08	1,200	–1	28.21
524.00	544.00	6.75E–07	1,200	0	70.93
544.00	564.00	5.46E–07	198	–1	27.32
564.00	584.00	4.43E–07	1,200	0	63.84
584.00	604.00	1.55E–06	61.2	0	19.72
299.00	304.00	6.46E–09	1,200	–1	22.19
304.00	309.00	1.34E–11	612	1	3.38
309.00	314.00	9.72E–09	1,200	–1	24.57
314.00	319.00	1.00E–11	#NV	#NV	#NV
319.00	324.00	7.25E–08	1,200	0	40.61
324.00	329.00	1.00E–11	#NV	#NV	#NV
329.00	334.00	4.08E–07	1,200	0	62.54
334.00	339.00	7.00E–06	7.2	0	6.59
339.00	344.00	3.15E–07	252	0	32.31
344.00	349.00	2.27E–06	1,200	0	96.05
349.00	354.00	1.02E–07	1,200	0	44.22
354.00	359.00	7.88E–10	108	–1	4.95
359.00	364.00	1.16E–06	1,200	0	81.21
364.00	369.00	1.34E–06	1,200	0	84.19
369.00	374.00	4.21E–07	1,200	0	63.03
374.00	379.00	1.55E–07	432	1	34.40

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)
379.00	384.00	2.88E–07	1,200	0	57.33
384.00	389.00	4.51E–07	1,200	0	64.13
389.00	394.00	1.97E–09	108	1	4.95
394.00	399.00	5.45E–08	1,200	0	37.81
399.00	404.00	7.03E–07	144	1	24.82
404.00	409.00	2.88E–08	108	1	9.67
409.00	414.00	8.03E–08	108	1	12.50
414.00	419.00	8.8E–07	1,200	0	75.79
419.00	424.00	7.15E–06	1,200	0	127.96
424.00	429.00	3.39E–06	144	1	36.78
429.00	434.00	5.16E–06	1,200	0	117.94
434.00	439.00	2.56E–08	54	–1	6.64
439.00	444.00	6.16E–11	108	1	2.08
444.00	449.00	1.04E–11	2,520	1	6.44
449.00	454.00	4.2E–10	1,200	0	11.20
454.00	459.00	6.52E–08	108	–1	11.86
459.00	464.00	3.47E–10	1,200	–1	10.68
464.00	469.00	7.59E–10	1,200	–1	12.99
469.00	474.00	6.43E–08	1,200	0	39.41
474.00	479.00	9.88E–08	1,200	0	43.87
477.00	482.00	3.17E–08	1,200	0	33.02
482.00	487.00	2.64E–08	252	0	16.00
487.00	492.00	4.42E–08	108	1	10.76
489.00	494.00	2.46E–08	144	–1	10.74
494.00	499.00	3.47E–09	1,200	–1	18.99
499.00	504.00	9.93E–11	678	0	5.87
504.00	509.00	1.59E–08	144	1	9.63
509.00	514.00	1.89E–09	696	0	12.43
514.00	519.00	1E–10	#NV	#NV	#NV
519.00	524.00	1.52E–08	180	1	10.64
524.00	529.00	6.11E–10	1,262	0	12.62
529.00	534.00	7.24E–10	1,273	0	13.22
534.00	539.00	8.81E–09	144	–1	8.30
539.00	544.00	1.56E–06	1,200	0	87.45
544.00	549.00	9.05E–08	72	–1	10.51
549.00	554.00	9.75E–09	360	–1	9.01
554.00	559.00	1.86E–09	54	–1	5.46
559.00	564.00	4.64E–07	144	–1	22.37
564.00	569.00	1.49E–07	1,200	0	48.62
569.00	574.00	1.00E–11	#NV	#NV	#NV
574.00	579.00	1.00E–11	#NV	#NV	#NV
579.00	584.00	1.41E–11	252	0	2.84
584.00	589.00	1.00E–11	#NV	#NV	#NV
589.00	594.00	1.55E–06	43.2	–1	16.57
594.00	599.00	2.64E–07	1,200	0	56.09

#NV not analysed/no value

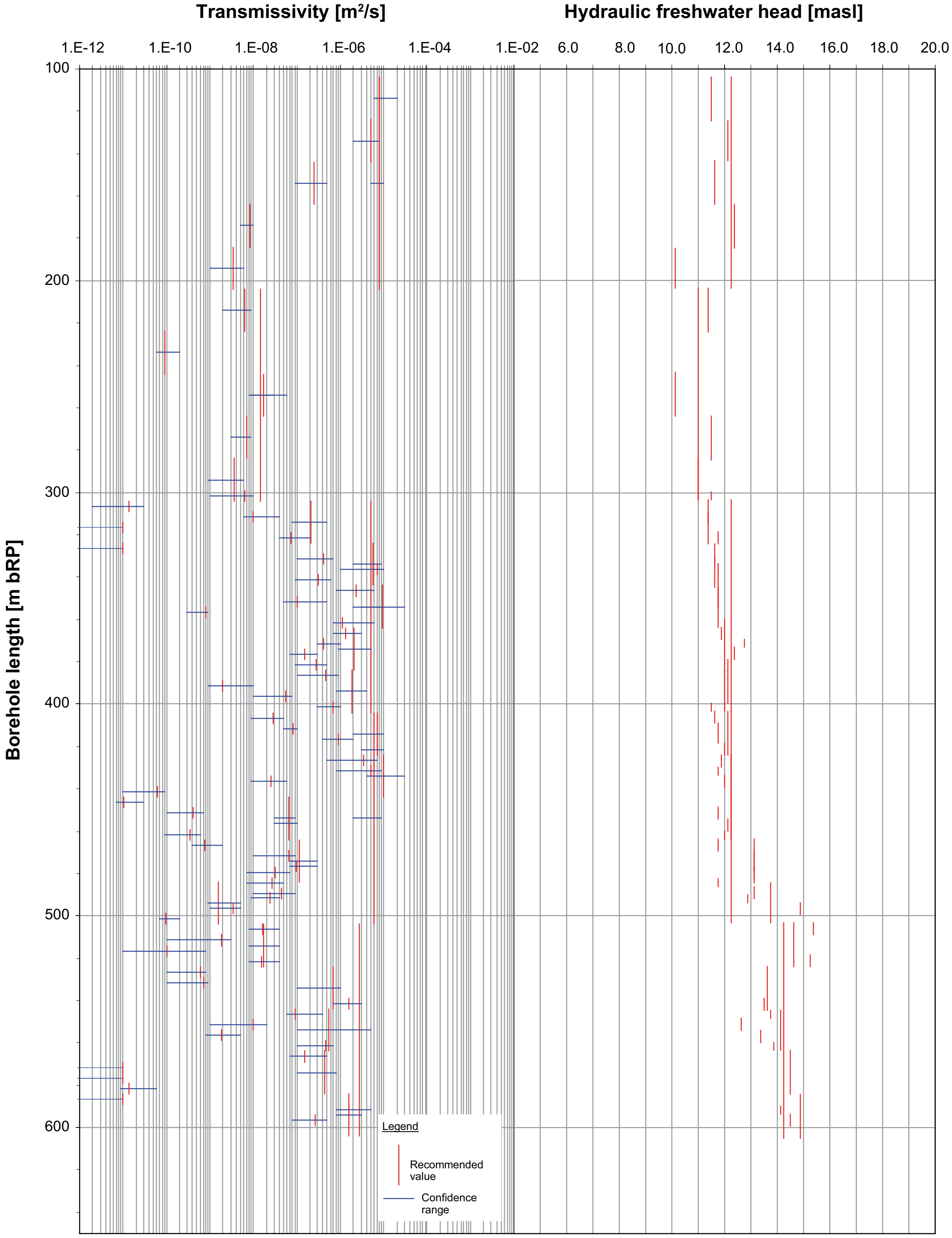


Figure 7-1. *Results summary – profiles of transmissivity and equivalent freshwater head, transmissivities derived from injectiontests, freshwater head extrapolated.*

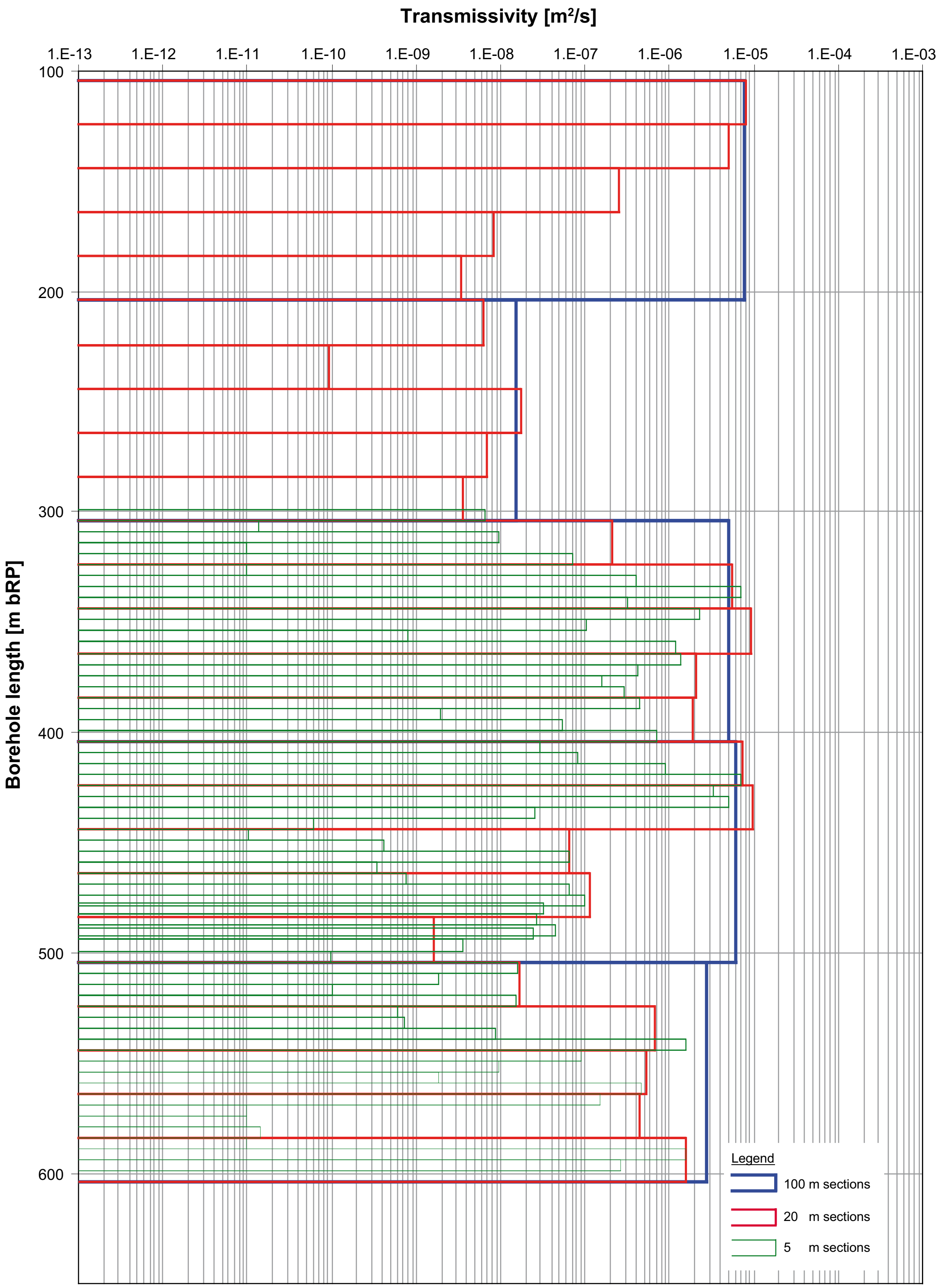


Figure 7-2. *Results summary – profile of transmissivity.*

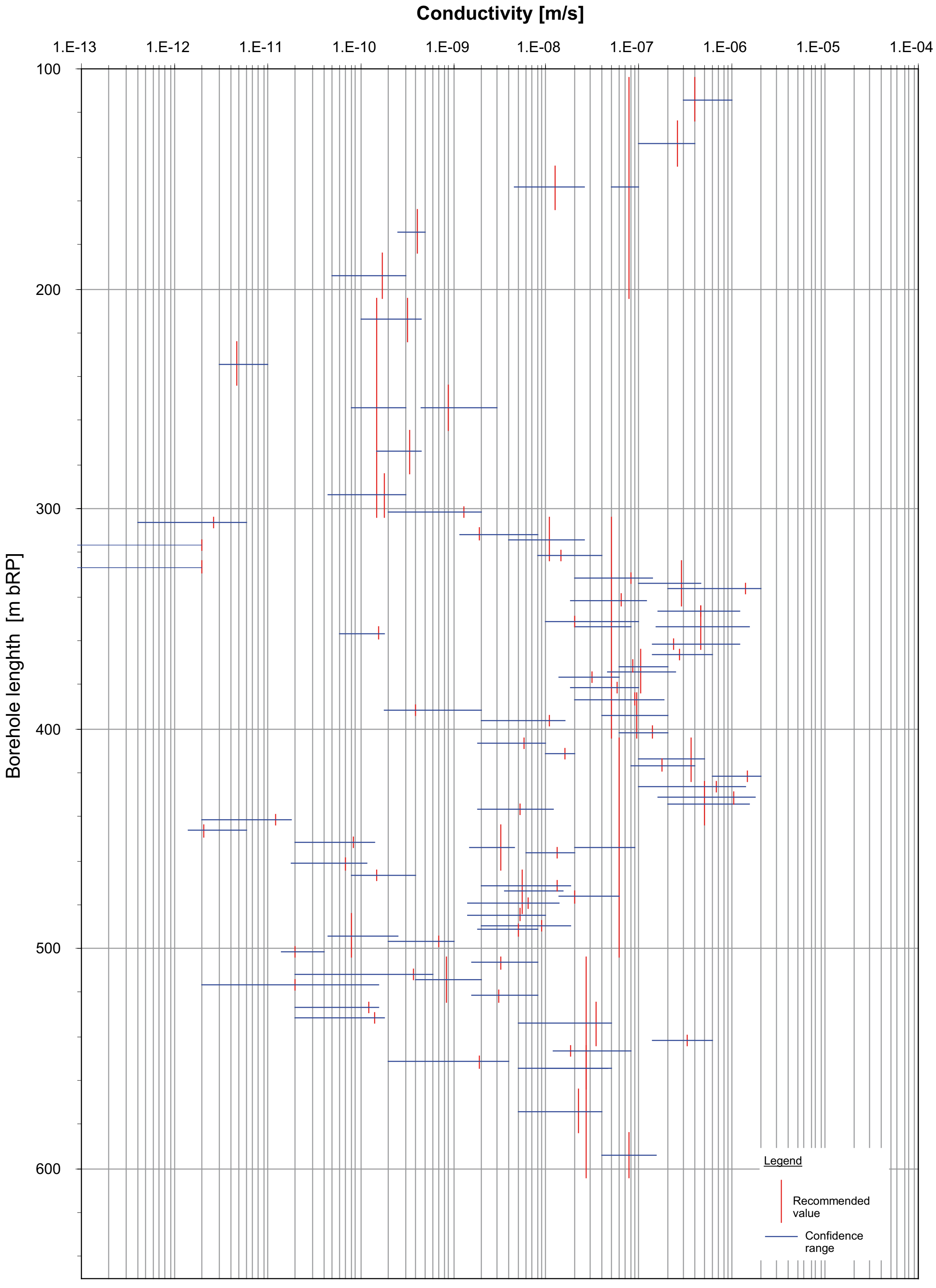


Figure 7-3. *Results summary – profile of hydraulic conductivity.*

7.2 Correlation analysis

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

7.2.1 Comparison of steady state and transient analysis results

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

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

7.2.2 Comparison between the matched and theoretical wellbore storage coefficient

The wellbore storage coefficient describes the capacity of the test interval to store fluid as result to an unit pressure change in the interval. For a closed system (i.e. closed downhole valve) the theoretical value of the wellbore storage coefficient is given by the product between the interval volume and the test zone compressibility. The interval volume is calculated from the borehole radius and interval length. There are uncertainties concerning the interval volume calculation. Cavities or high transmissivity fractures intersecting the interval may enlarge the effective volume of the interval.

The test zone compressibility is given by the sum of compressibilities of the individual components present in the interval (water, packer elements, other test tool components, and the borehole wall). 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.

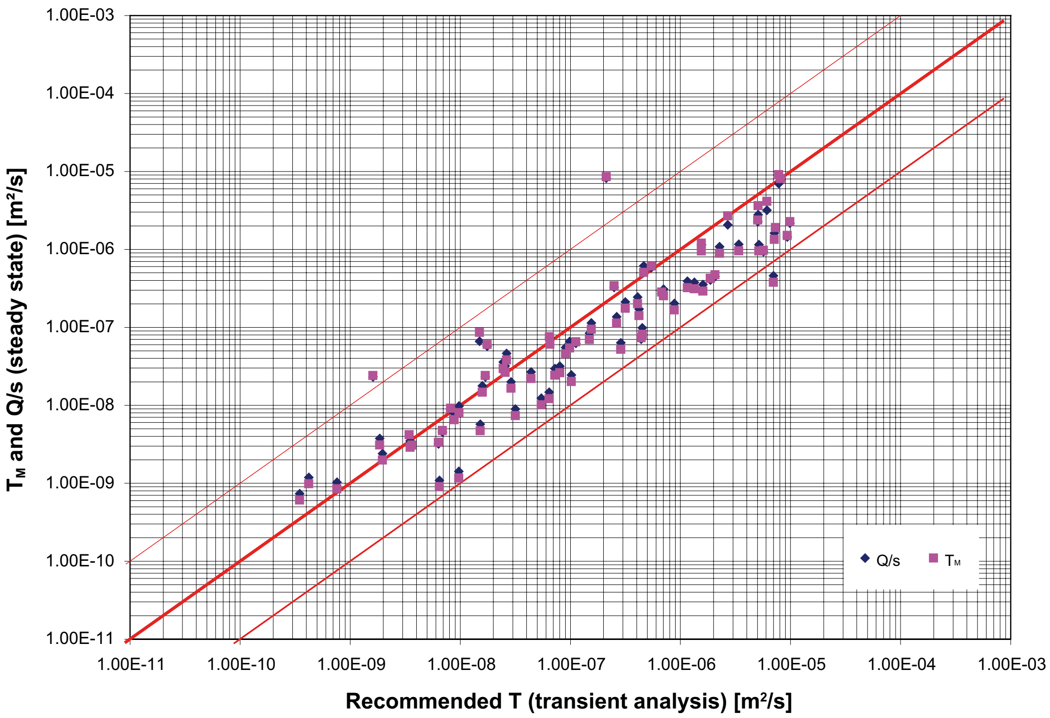


Figure 7-4. *Correlation analysis of transmissivities derived by steady state and transient methods.*

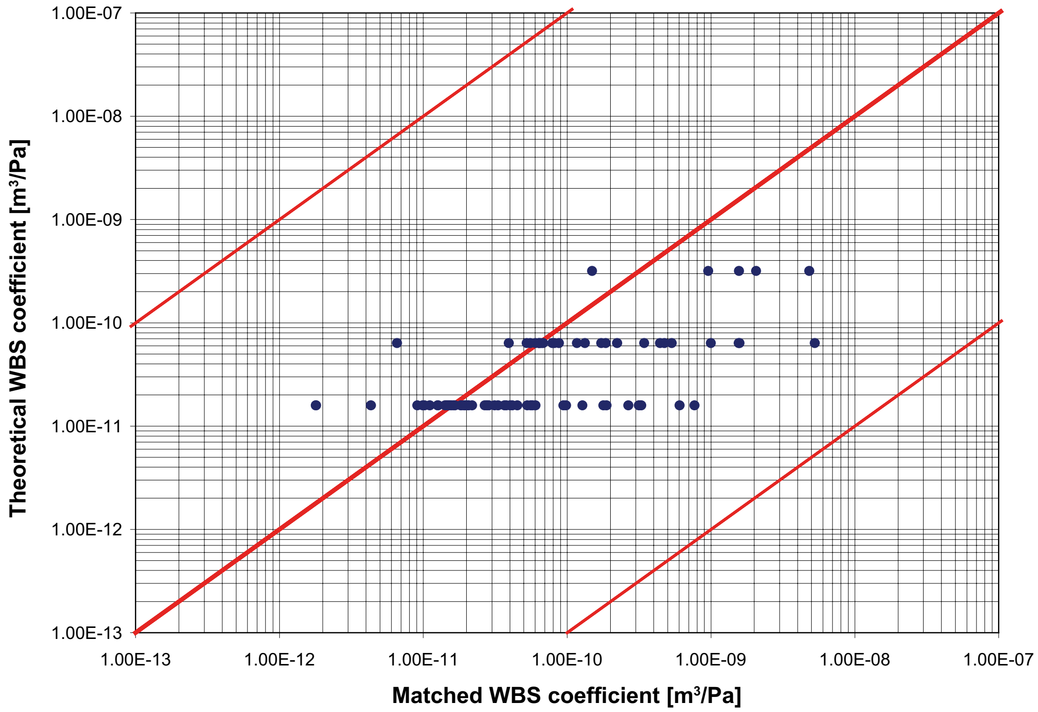


Figure 7-5. *Correlation analysis of theoretical and matched wellbore storage coefficients.*

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 follows:

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

ΔV Volume change of 2 packers (The volume change was estimated at $7{\cdot}10^{-7}$ m³/100 kPa based on the results of laboratory tests conducted by GEOSIGMA) [m³]

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

V Volume in test section [m³]

The following table presents the calculated compressibilities for each relevant section length. The average value for the test tool compressibility based on different section length 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.

Table 7-4. Test tool compressibility values based on packer displacement.

Length of test section [m]	Volume in test section [m³]	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:		$1{\cdot}10^{-10}$

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

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

It can be seen that the matched wellbore storage coefficients are up to two orders of magnitude larger than the theoretical. 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 hypthesis.

8 Conclusions

8.1 Transmissivity

Figure 7-1 presents a profile of transmissivity, including the confidence ranges derived from the transient analysis. The method used for deriving the recommended transmissivity and its confidence range is described in Section 5.5.8.

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

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

If the conducted preliminary pulse injection (PI) showed a slow recovery the pulse test was prolonged and no further injection test was performed. The pulse test was used for a quantitative analysis. The recommended transmissivities of the pulse tests range between $1.0 \cdot 10^{-11}$ m²/s and $1.9 \cdot 10^{-09}$ m²/s.

The recommended transmissivities derived from the conducted injection tests (CHi and CHir) range between $3.5 \cdot 10^{-10}$ m²/s and $9.9 \cdot 10^{-6}$ m²/s.

A few 20 m and 5 m sections show larger transmissivities than the appropriate longer interval. The most of the differences are relatively small and are covered by the confidence range. This can be explained by crossflow and connections to the adjacent zones.

8.2 Equivalent freshwater head

Figure 7-1 presents a profile of the derived equivalent freshwater head expressed in meters above sea level. The method used for deriving the equivalent freshwater head is described in Section 5.5.7.

The head profile shows the the freshwater head ranges from 10.2 m to 15.4 m. The highest freshwater heads are measured between 500 m and 600 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.

8.3 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 $1 \cdot 10^{-8}$ 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, 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. 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. Those analyses are presented in Appendix 2.

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APPENDIX 1

File Description Table

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KLX11A				
TEST- AND FILEPROTOCOL					Testorder dated : 2006-06-27				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
2006-08-15	10:44	104.00	204.00	__KLX18A_0104.00_200608151044.ht2	KLX18A_104.00-204.00_060815_1_CHir_Q_r.csv	Chir	2006-08-26	2006-08-15	
2006-08-15	14:05	204.00	304.00	__KLX18A_0204.00_200608151405.ht2	KLX18A_204.00-304.00_060815_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-15	
2006-08-15	17:25	304.00	404.00	__KLX18A_0304.00_200608151725.ht2	KLX18A_304.00-404.00_060815_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-15	
2006-08-15	21:08	404.00	504.00	__KLX18A_0404.00_200608152108.ht2	KLX18A_404.00-504.00_060815_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-16	
2006-08-16	07:34	504.00	604.00	__KLX18A_0504.00_200608160734.ht2	KLX18A_504.00-604.00_060816_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-16	
2006-08-16	19:58	104.00	124.00	__KLX18A_0104.00_200608161958.ht2	KLX18A_104.00-124.00_060816_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-16	
2006-08-16	22:02	124.00	144.00	__KLX18A_0124.00_200608162202.ht2	KLX18A_124.00-144.00_060816_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-16	
2006-08-16	23:59	144.00	164.00	__KLX18A_0144.00_200608162359.ht2	KLX18A_144.00-164.00_060816_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-17	
2006-08-17	06:38	164.00	184.00	__KLX18A_0164.00_200608170638.ht2	KLX18A_164.00-184.00_060817_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-17	
2006-08-17	09:06	184.00	204.00	__KLX18A_0184.00_200608170906.ht2	KLX18A_184.00-204.00_060817_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-17	
2006-08-17	11:27	204.00	224.00	__KLX18A_0204.00_200608171127.ht2	KLX18A_204.00-224.00_060817_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-17	
2006-08-17	12:13	204.00	224.00	__KLX18A_0204.00_200608171213.ht2	KLX18A_204.00-224.00_060817_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-17	
2006-08-17	14:08	224.00	244.00	__KLX18A_0224.00_200608171408.ht2	KLX18A_224.00-244.00_060817_1_Pi_Q_r.csv	Pi	2006-08-27	2006-08-17	
2006-08-17	16:43	244.00	264.00	__KLX18A_0244.00_200608171643.ht2	KLX18A_244.00-264.00_060817_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-17	
2006-08-17	18:46	264.00	284.00	__KLX18A_0264.00_200608171846.ht2	KLX18A_264.00-284.00_060817_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-17	
2006-08-17	21:22	284.00	304.00	__KLX18A_0284.00_200608172122.ht2	KLX18A_284.00-304.00_060817_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-17	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KLX11A				
TEST- AND FILEPROTOCOL					Testorder dated : 2006-06-27				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
2006-08-18	23:30	304.00	324.00	__KLX18A_0304.00_200608172330.ht2	KLX18A_304.00-324.00_060817_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-18	
2006-08-18	01:24	324.00	344.00	__KLX18A_0324.00_200608180124.ht2	KLX18A_324.00-344.00_060818_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-18	
2006-08-18	06:29	344.00	364.00	__KLX18A_0344.00_200608180629.ht2	KLX18A_344.00-364.00_060818_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-18	
2006-08-18	08:34	364.00	384.00	__KLX18A_0364.00_200608180834.ht2	KLX18A_364.00-384.00_060818_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-18	
2006-08-18	10:38	384.00	404.00	__KLX18A_0384.00_200608181038.ht2	KLX18A_384.00-404.00_060818_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-18	
2006-08-18	13:16	404.00	424.00	__KLX18A_0404.00_200608181316.ht2	KLX18A_404.00-424.00_060818_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-18	
2006-08-18	15:16	424.00	444.00	__KLX18A_0424.00_200608181516.ht2	KLX18A_424.00-444.00_060818_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-18	
2006-08-18	17:20	444.00	464.00	__KLX18A_0444.00_200608181720.ht2	KLX18A_444.00-464.00_060818_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-18	
2006-08-18	19:13	464.00	484.00	__KLX18A_0464.00_200608181913.ht2	KLX18A_464.00-484.00_060818_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-18	
2006-08-19	00:45	484.00	504.00	__KLX18A_0484.00_200608190045.ht2	KLX18A_484.00-504.00_060818_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-19	
2006-08-19	06:24	504.00	524.00	__KLX18A_0504.00_200608190624.ht2	KLX18A_504.00-524.00_060819_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-19	
2006-08-19	08:45	524.00	544.00	__KLX18A_0524.00_200608190845.ht2	KLX18A_524.00-544.00_060819_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-19	
2006-08-19	10:56	544.00	564.00	__KLX18A_0544.00_200608191056.ht2	KLX18A_544.00-564.00_060819_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-19	
2006-08-19	13:29	564.00	584.00	__KLX18A_0564.00_200608191329.ht2	KLX18A_564.00-584.00_060819_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-19	
2006-08-19	15:30	584.00	604.00	__KLX18A_0584.00_200608191530.ht2	KLX18A_584.00-604.00_060819_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-20	
2006-08-20	08:53	299.00	304.00	__KLX18A_0299.00_200608200853.ht2	KLX18A_299.00-304.00_060820_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-20	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KLX11A				
TEST- AND FILEPROTOCOL					Testorder dated : 2006-06-27				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
2006-08-20	10:58	304.00	309.00	__KLX18A_0304.00_200608201058.ht2	KLX18A_304.00-309.00_060820_1_Pi_Q_r.csv	Pi	2006-08-27	2006-08-20	
2006-08-20	13:33	309.00	314.00	__KLX18A_0309.00_200608201333.ht2	KLX18A_309.00-314.00_060820_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-20	
2006-08-20	15:29	314.00	319.00	__KLX18A_0314.00_200608201528.ht2	KLX18A_314.00-319.00_060820_1_Pi_Q_r.csv	Pi	2006-08-27	2006-08-20	
2006-08-20	16:52	319.00	324.00	__KLX18A_0319.00_200608201652.ht2	KLX18A_319.00-324.00_060820_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-20	
2006-08-20	18:35	324.00	329.00	__KLX18A_0324.00_200608201835.ht2	KLX18A_324.00-329.00_060820_1_Pi_Q_r.csv	Pi	2006-08-27	2006-08-20	
2006-08-20	19:53	329.00	334.00	__KLX18A_0329.00_200608201953.ht2	KLX18A_329.00-334.00_060820_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-20	
2006-08-20	21:58	334.00	339.00	__KLX18A_0334.00_200608202158.ht2	KLX18A_334.00-339.00_060820_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-20	
2006-08-21	00:08	339.00	344.00	__KLX18A_0339.00_200608210008.ht2	KLX18A_339.00-344.00_060821_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-21	
2006-08-21	01:55	344.00	349.00	__KLX18A_0344.00_200608210155.ht2	KLX18A_344.00-349.00_060821_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-21	
2006-08-21	06:23	349.00	354.00	__KLX18A_0349.00_200608210623.ht2	KLX18A_349.00-354.00_060821_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-21	
2006-08-21	08:44	354.00	359.00	__KLX18A_0354.00_200608210844.ht2	KLX18A_354.00-359.00_060821_1_Pi_Q_r.csv	Pi	2006-08-27	2006-08-21	
2006-08-21	10:37	359.00	364.00	__KLX18A_0359.00_200608211037.ht2	KLX18A_359.00-364.00_060821_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-21	
2006-08-21	13:02	364.00	369.00	__KLX18A_0364.00_200608211302.ht2	KLX18A_364.00-369.00_060821_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-21	
2006-08-21	15:02	369.00	374.00	__KLX18A_0369.00_200608211502.ht2	KLX18A_369.00-374.00_060821_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-21	
2006-08-21	16:42	374.00	379.00	__KLX18A_0374.00_200608211642.ht2	KLX18A_374.00-379.00_060821_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-21	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KLX11A				
TEST- AND FILEPROTOCOL					**Testorder dated : 2006-06-27**				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
2006-08-21	18:28	379.00	384.00	__KLX18A_0379.00_200608211828.ht2	KLX18A_379.00-384.00_060821_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-21	
2006-08-21	20:20	384.00	389.00	__KLX18A_0384.00_200608212020.ht2	KLX18A_384.00-389.00_060821_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-21	
2006-08-21	22:03	389.00	394.00	__KLX18A_0389.00_200608212203.ht2	KLX18A_389.00-394.00_060821_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-21	
2006-08-21	23:58	394.00	399.00	__KLX18A_0394.00_200608212358.ht2	KLX18A_394.00-399.00_060821_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-22	
2006-08-22	06:19	399.00	404.00	__KLX18A_0399.00_200608220619.ht2	KLX18A_399.00-404.00_060822_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-22	
2006-08-22	08:10	404.00	409.00	__KLX18A_0404.00_200608220810.ht2	KLX18A_404.00-409.00_060822_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-22	
2006-08-22	10:09	409.00	414.00	__KLX18A_0409.00_200608221009.ht2	KLX18A_409.00-414.00_060822_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-22	
2006-08-22	14:07	414.00	419.00	__KLX18A_0414.00_200608221407.ht2	KLX18A_414.00-419.00_060822_2_CHir_Q_r.csv	Chir	2006-08-27	2006-08-22	
2006-08-22	15:59	419.00	424.00	__KLX18A_0419.00_200608221559.ht2	KLX18A_419.00-424.00_060822_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-22	
2006-08-22	17:42	424.00	429.00	__KLX18A_0424.00_200608221742.ht2	KLX18A_424.00-429.00_060822_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-22	
2006-08-22	19:32	429.00	434.00	__KLX18A_0429.00_200608221932.ht2	KLX18A_429.00-434.00_060822_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-22	
2006-08-22	21:24	434.00	439.00	__KLX18A_0434.00_200608222124.ht2	KLX18A_434.00-439.00_060822_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-22	
2006-08-22	23:10	439.00	444.00	__KLX18A_0439.00_200608222310.ht2	KLX18A_439.00-444.00_060822_1_Pi_Q_r.csv	Pi	2006-08-27	2006-08-23	
2006-08-23	01:02	444.00	449.00	__KLX18A_0444.00_200608230102.ht2	KLX18A_444.00-449.00_060823_1_Pi_Q_r.csv	Pi	2006-08-27	2006-08-23	
2006-08-23	06:23	449.00	454.00	__KLX18A_0449.00_200608230623.ht2	KLX18A_449.00-454.00_060823_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-23	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KLX11A				
TEST- AND FILEPROTOCOL					**Testorder dated : 2006-06-27**				
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Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
2006-08-23	08:37	454.00	459.00	__KLX18A_0454.00_200608230837.ht2	KLX18A_454.00-459.00_060823_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-23	
2006-08-23	10:41	459.00	464.00	__KLX18A_0459.00_200608231041.ht2	KLX18A_459.00-464.00_060823_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-23	
2006-08-23	13:31	464.00	469.00	__KLX18A_0464.00_200608231331.ht2	KLX18A_464.00-469.00_060823_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-23	
2006-08-23	15:40	469.00	474.00	__KLX18A_0469.00_200608231636.ht2	KLX18A_469.00-474.00_060823_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-23	
2006-08-23	18:19	474.00	479.00	__KLX18A_0474.00_200608231819.ht2	KLX18A_474.00-479.00_060823_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-23	
2006-08-23	20:08	477.00	482.00	__KLX18A_0477.00_200608232008.ht2	KLX18A_477.00-482.00_060823_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-23	
2006-08-23	21:55	482.00	487.00	__KLX18A_0482.00_200608232155edit.ht2	KLX18A_482.00-487.00_060823_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-23	
2006-08-23	23:55	487.00	492.00	__KLX18A_0487.00_200608232355.ht2	KLX18A_487.00-492.00_060823_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-24	
2006-08-24	06:23	489.00	494.00	__KLX18A_0489.00_200608240623.ht2	KLX18A_489.00-494.00_060824_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-24	
2006-08-24	08:48	494.00	499.00	__KLX18A_0494.00_200608240848.ht2	KLX18A_494.00-499.00_060824_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-24	
2006-08-24	11:04	499.00	504.00	__KLX18A_0499.00_200608241104.ht2	KLX18A_499.00-504.00_060824_1_CHir_Q_r.csv	Pi	2006-08-27	2006-08-24	
2006-08-24	14:09	504.00	509.00	__KLX18A_0504.00_200608241409.ht2	KLX18A_504.00-509.00_060824_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-24	
2006-08-24	16:44	509.00	514.00	__KLX18A_0509.00_200608241644.ht2	KLX18A_509.00-514.00_060824_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-24	
2006-08-24	18:02	514.00	519.00	__KLX18A_0514.00_200608241802.ht2	KLX18A_514.00-519.00_060824_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-24	
2006-08-24	19:21	519.00	524.00	__KLX18A_0519.00_200608241921.ht2	KLX18A_519.00-524.00_060824_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-24	

HYDROTESTING WITH PSS					DRILLHOLE IDENTIFICATION NO.: KLX11A				
TEST- AND FILEPROTOCOL					**Testorder dated : 2006-06-27**				
Teststart		Interval boundaries		Name of Datafiles		Testtype	Copied to	Plotted	Sign.
Date	Time	Upper	Lower	(*.HT2-file)	(*.CSV-file)		disk/CD	(date)	
2006-08-24	21:09	524.00	529.00	__KLX18A_0524.00_200608242109.ht2	KLX18A_524.00-529.00_060824_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-24	
2006-08-24	22:37	529.00	534.00	__KLX18A_0529.00_200608242237.ht2	KLX18A_529.00-534.00_060824_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-24	
2006-08-25	00:07	534.00	539.00	__KLX18A_0534.00_200608250007.ht2	KLX18A_534.00-539.00_060825_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-25	
2006-08-25	06:09	539.00	544.00	__KLX18A_0539.00_200608250609.ht2	KLX18A_539.00-544.00_060825_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-25	
2006-08-25	08:29	544.00	549.00	__KLX18A_0544.00_200608250829.ht2	KLX18A_544.00-549.00_060825_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-25	
2006-08-25	10:32	549.00	554.00	__KLX18A_0549.00_200608251032.ht2	KLX18A_549.00-554.00_060825_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-25	
2006-08-25	13:24	554.00	559.00	__KLX18A_0554.00_200608251324.ht2	KLX18A_554.00-559.00_060825_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-25	
2006-08-25	15:36	559.00	564.00	__KLX18A_0559.00_200608251536.ht2	KLX18A_559.00-564.00_060825_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-25	
2006-08-25	17:19	564.00	569.00	__KLX18A_0564.00_200608251719.ht2	KLX18A_564.00-569.00_060825_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-25	
2006-08-25	19:03	569.00	574.00	__KLX18A_0569.00_200608251903.ht2	KLX18A_569.00-574.00_060825_1_Pi_Q_r.csv	Pi	2006-08-27	2006-08-25	
2006-08-25	21:36	574.00	579.00	__KLX18A_0574.00_200608252136.ht2	KLX18A_574.00-579.00_060825_1_CHir_Q_r.csv	Chir	2006-08-27	2006-08-25	
2006-08-25	22:38	579.00	584.00	__KLX18A_0579.00_200608252238.ht2	KLX18A_579.00-584.00_060825_1_Chir_Q_r.csv	Chir	2006-08-27	2006-08-25	
2006-08-26	00:20	584.00	589.00	__KLX18A_0584.00_200608260020.ht2	KLX18A_584.00-589.00_060826_1_Chir_Q_r.csv	Chir	2006-08-27	2006-08-26	
2006-08-26	06:16	589.00	594.00	__KLX18A_0589.00_200608260616.ht2	KLX18A_589.00-594.00_060826_1_Chir_Q_r.csv	Chir	2006-08-27	2006-08-26	
2006-08-26	08:29	594.00	599.00	__KLX18A_0594.00_200608260829.ht2	KLX18A_594.00-599.00_060826_1_Chir_Q_r.csv	Chir	2006-08-27	2006-08-26	

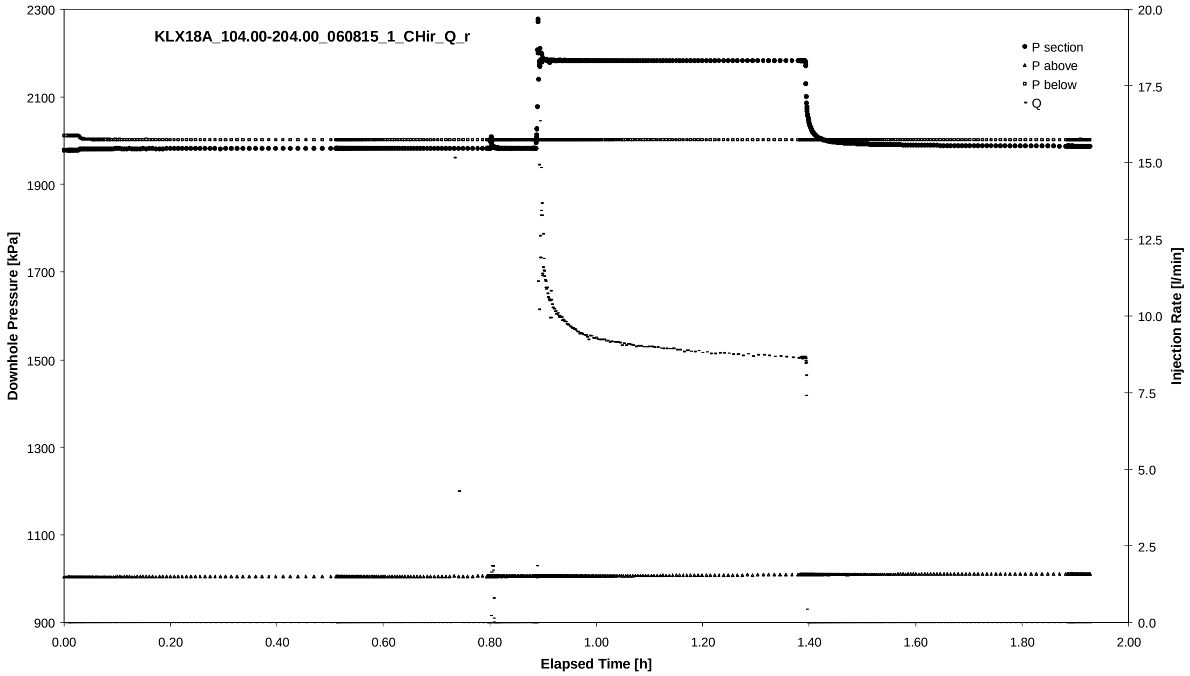
APPENDIX 2

Analysis diagrams

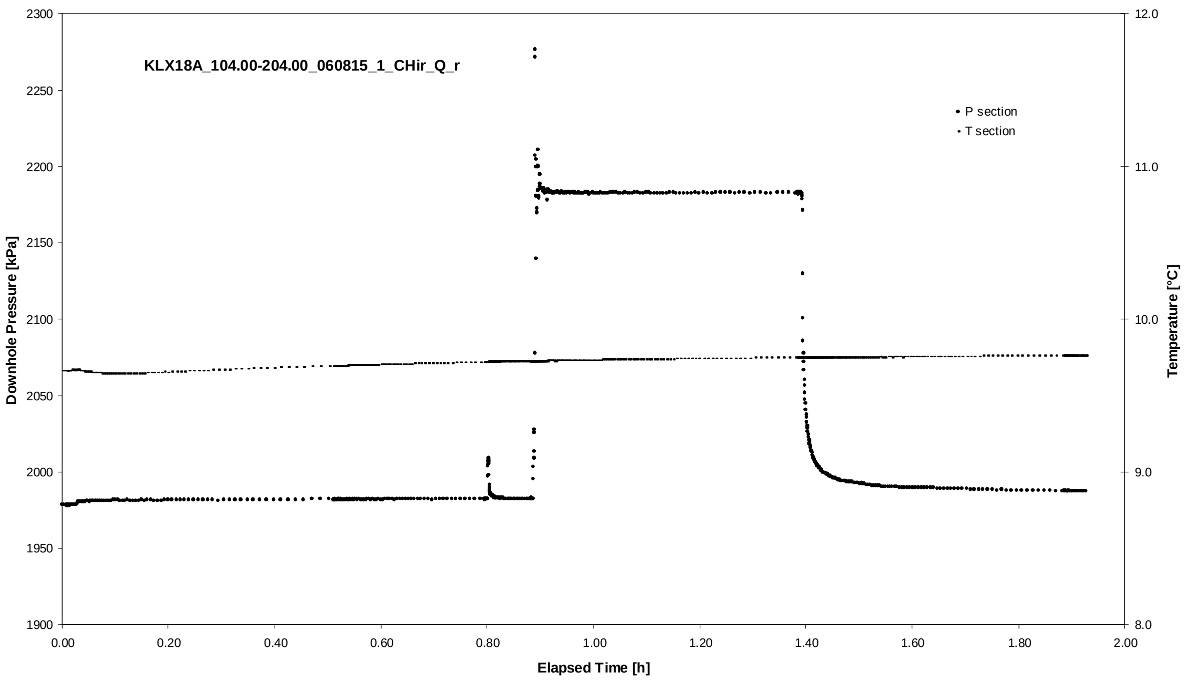
APPENDIX 2-1

Test 104.00 – 204.00 m

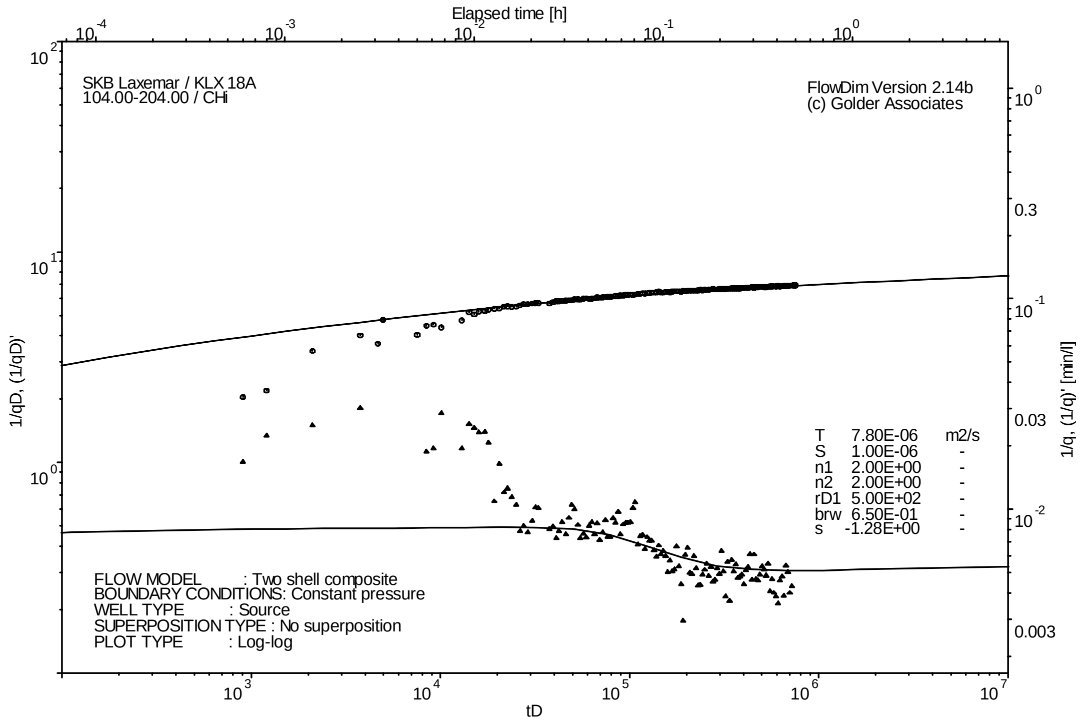
Analysis diagrams



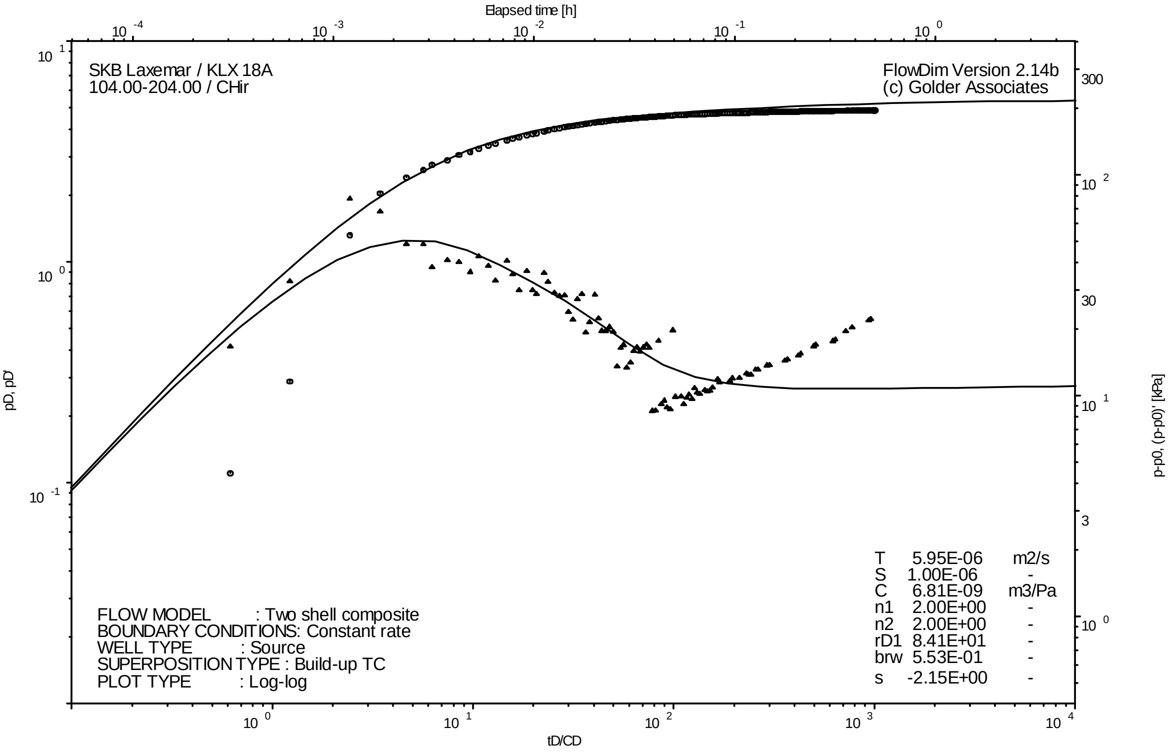
Pressure and flow rate vs. time; cartesian plot



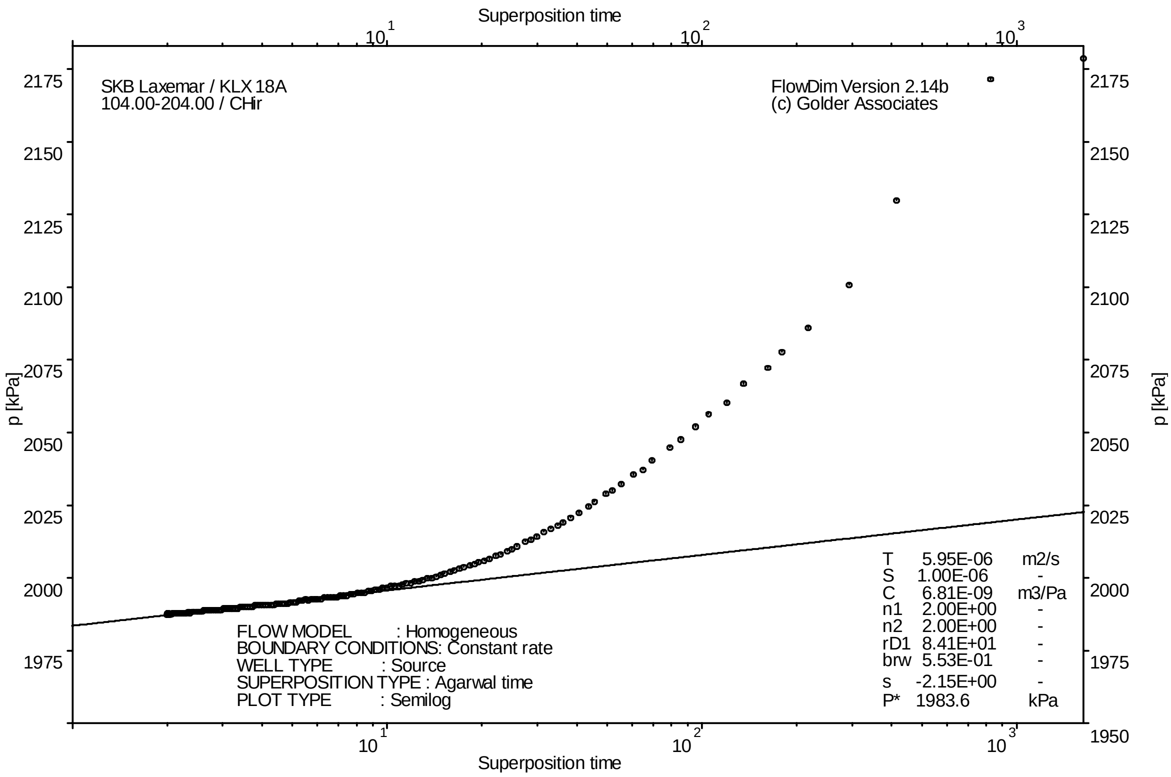
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

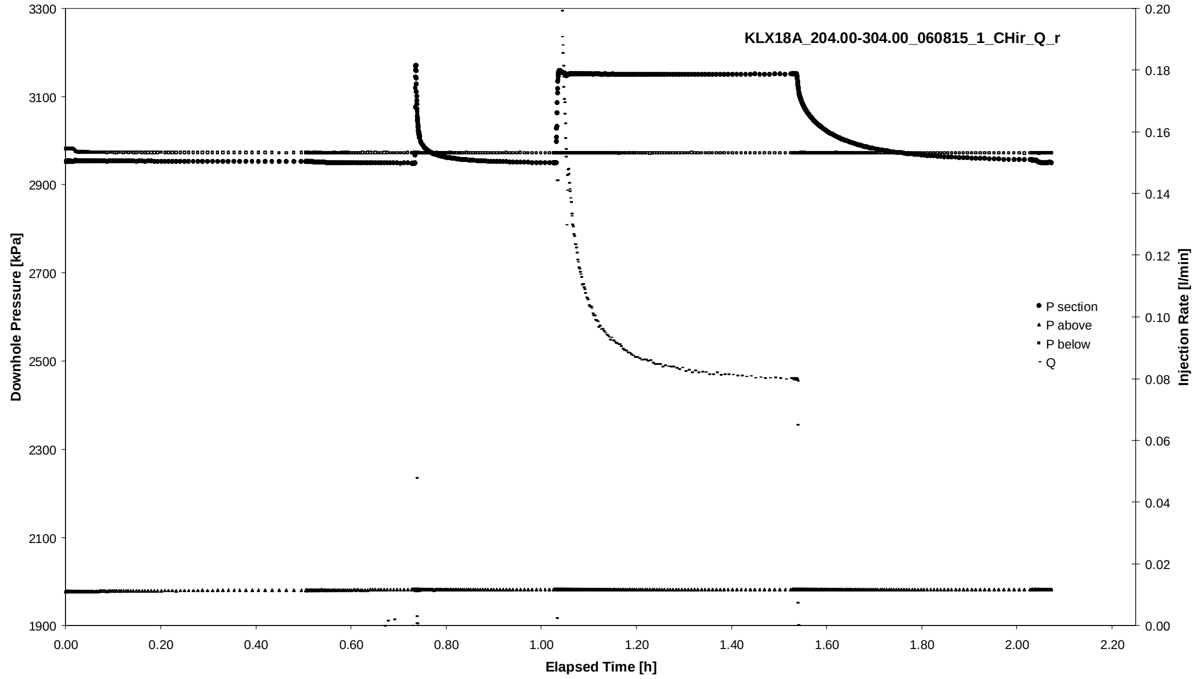


CHIR phase; HORNER match

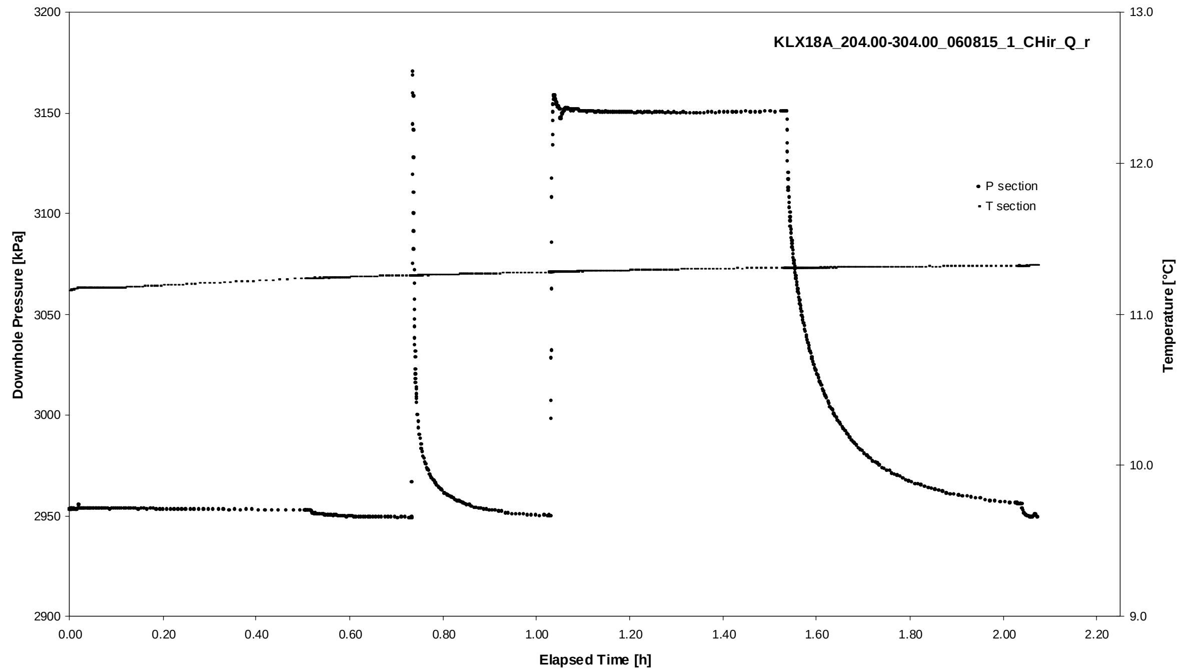
APPENDIX 2-2

Test 204.00 – 304.00 m

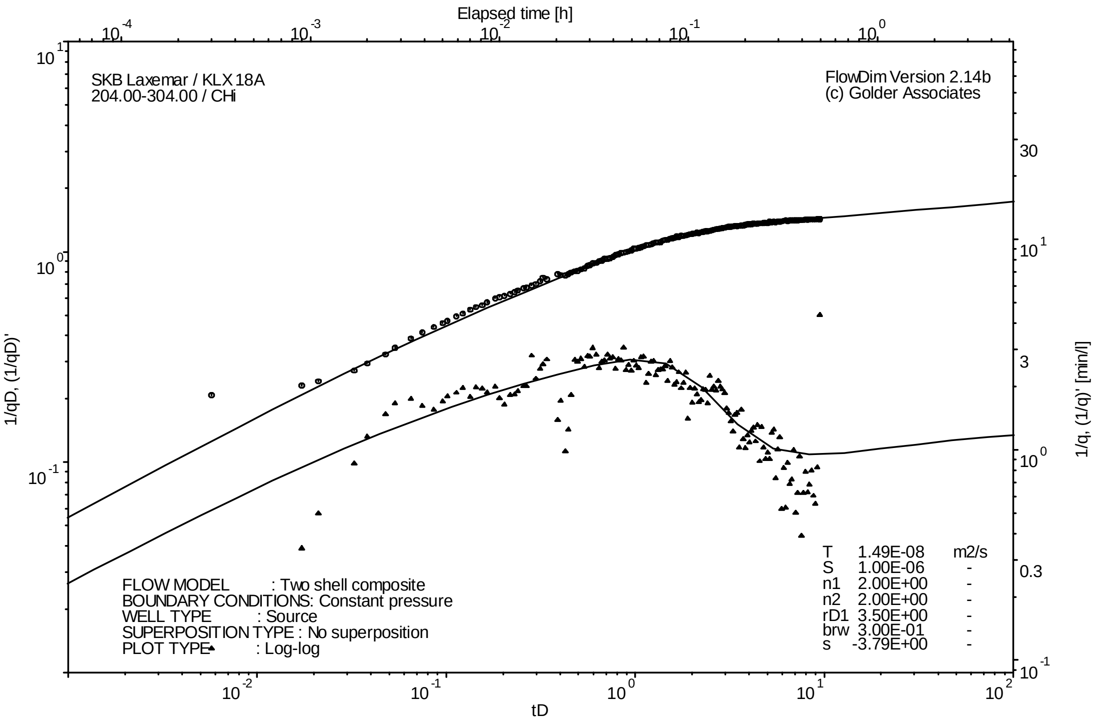
Analysis diagrams



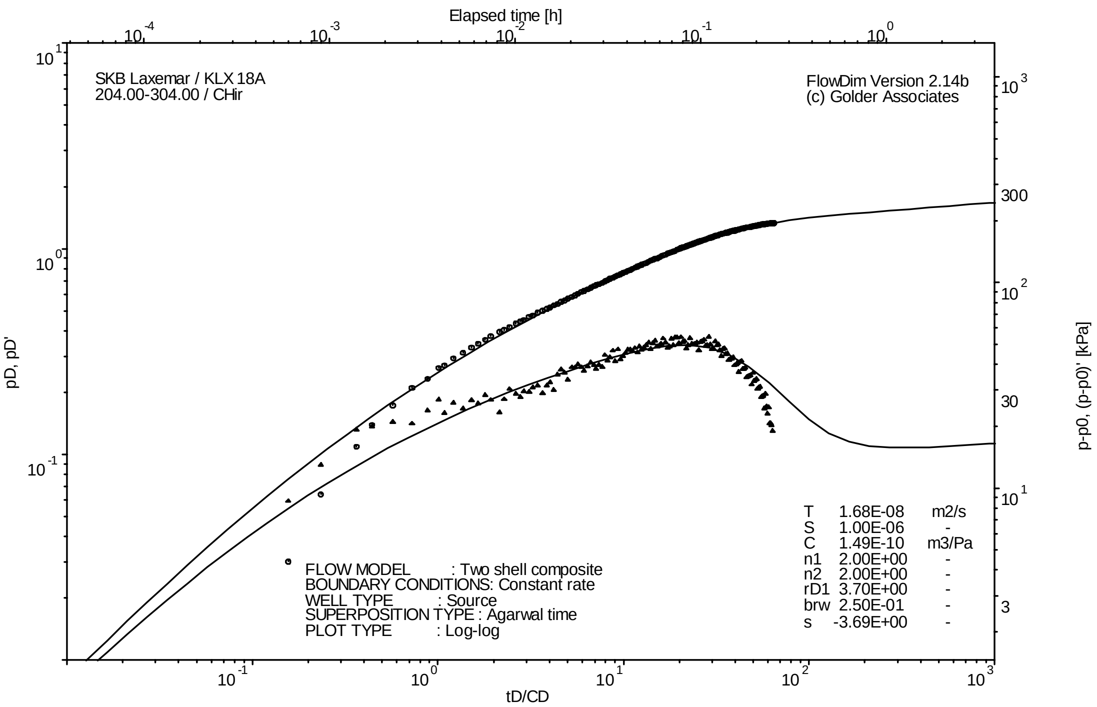
Pressure and flow rate vs. time; cartesian plot



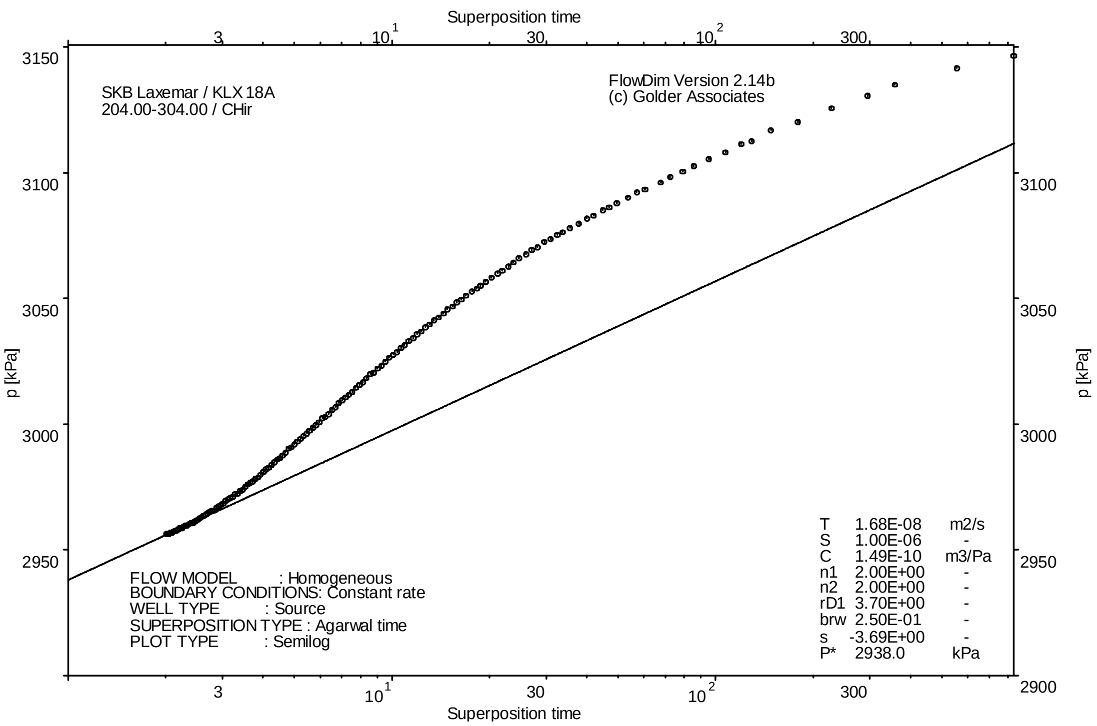
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

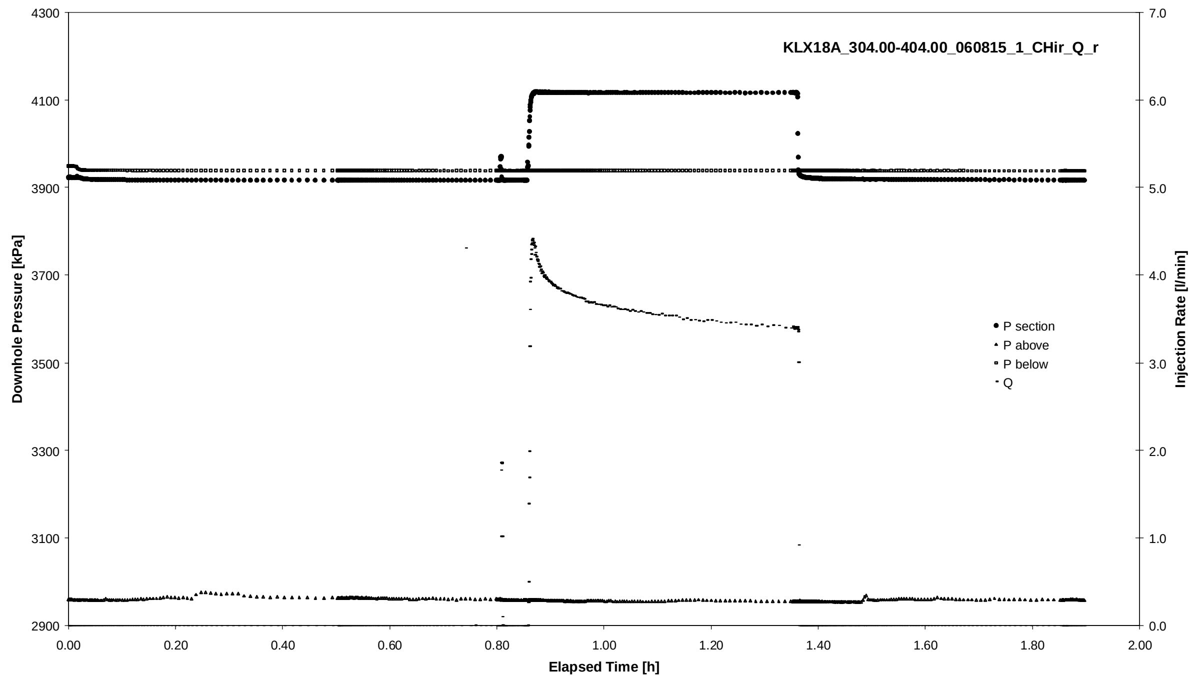


CHIR phase; HORNER match

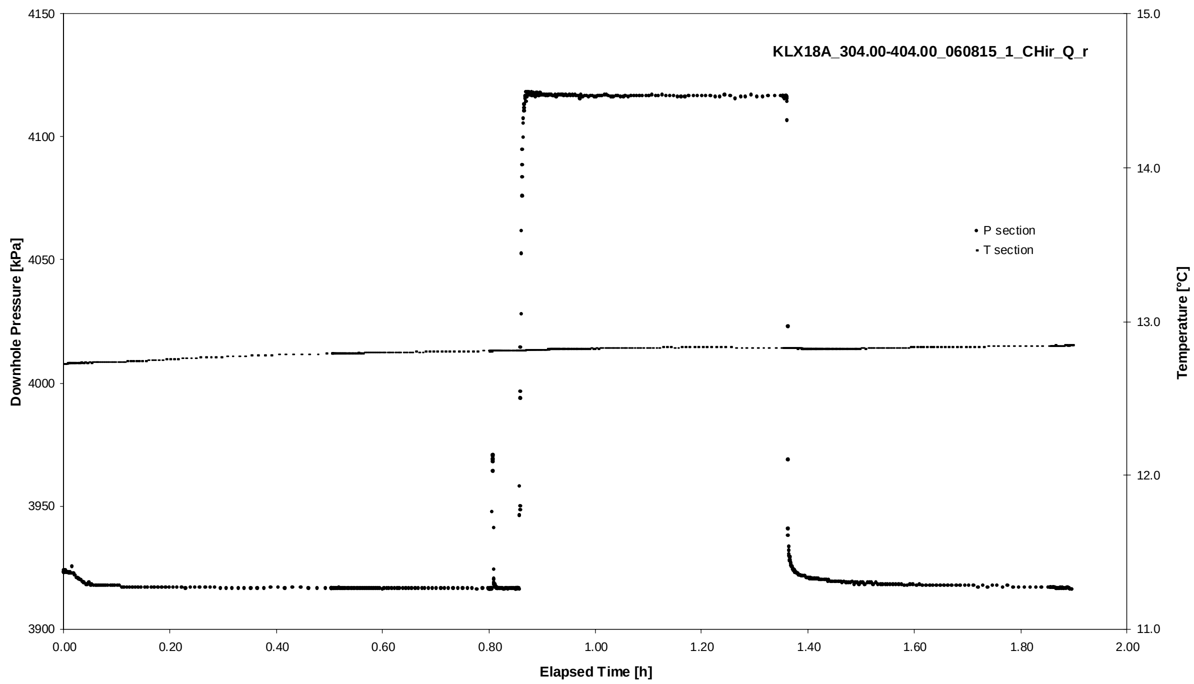
APPENDIX 2-3

Test 304.00 – 404.00 m

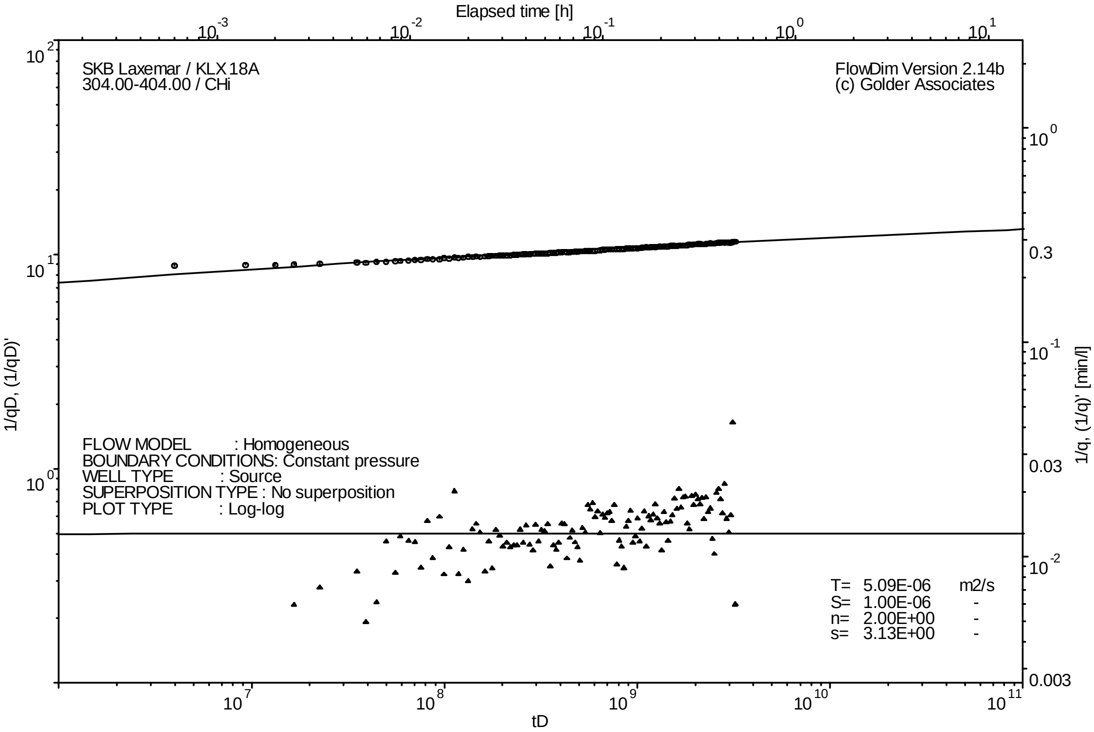
Analysis diagrams



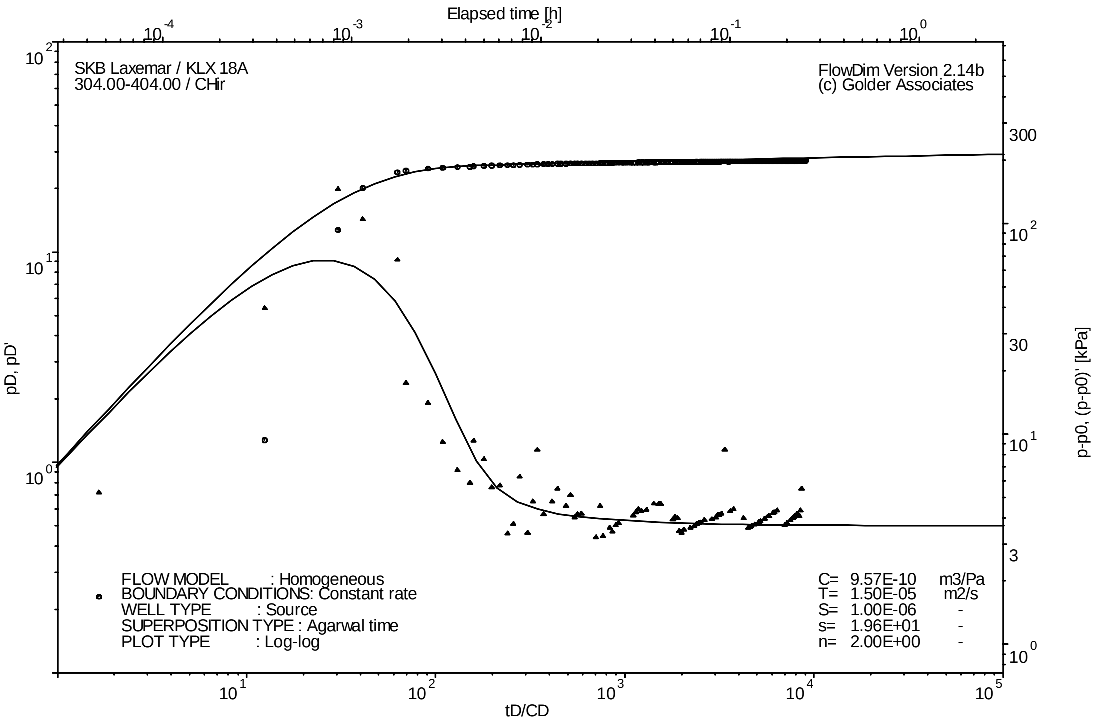
Pressure and flow rate vs. time; cartesian plot



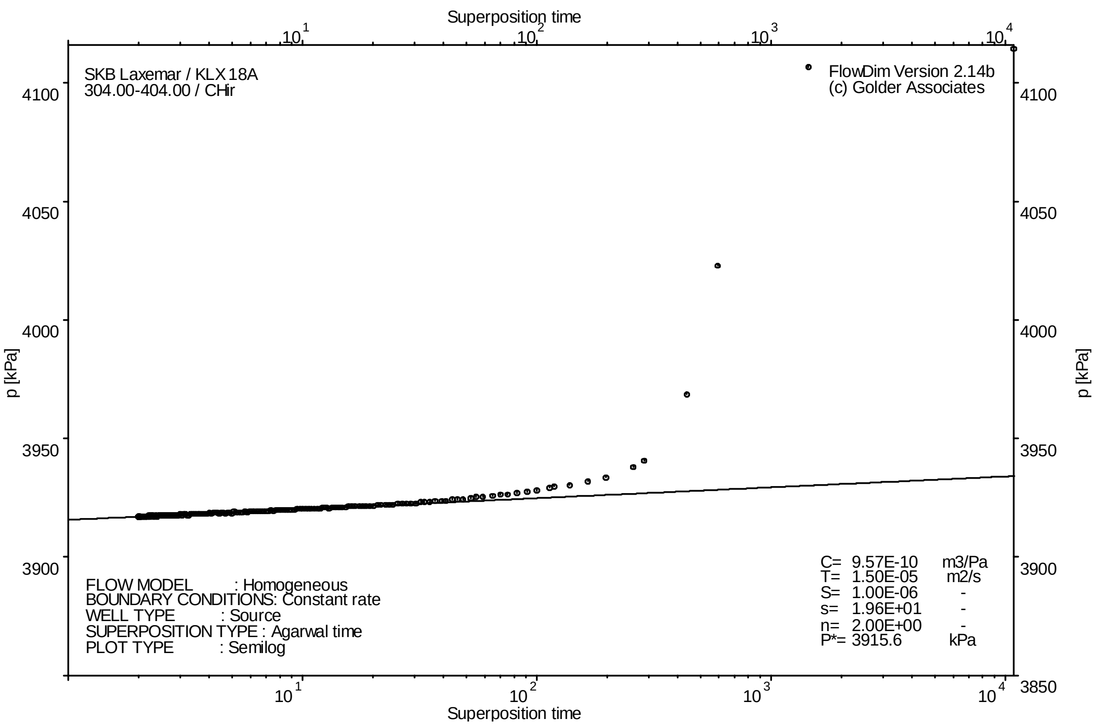
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

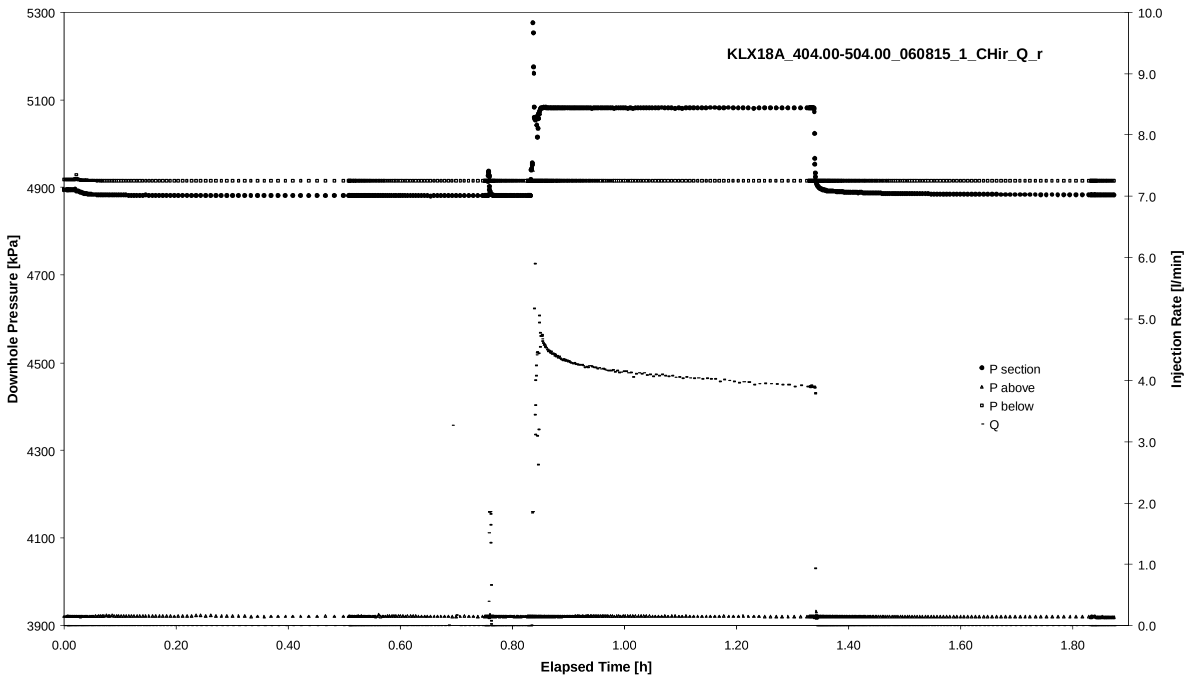


CHIR phase; HORNER match

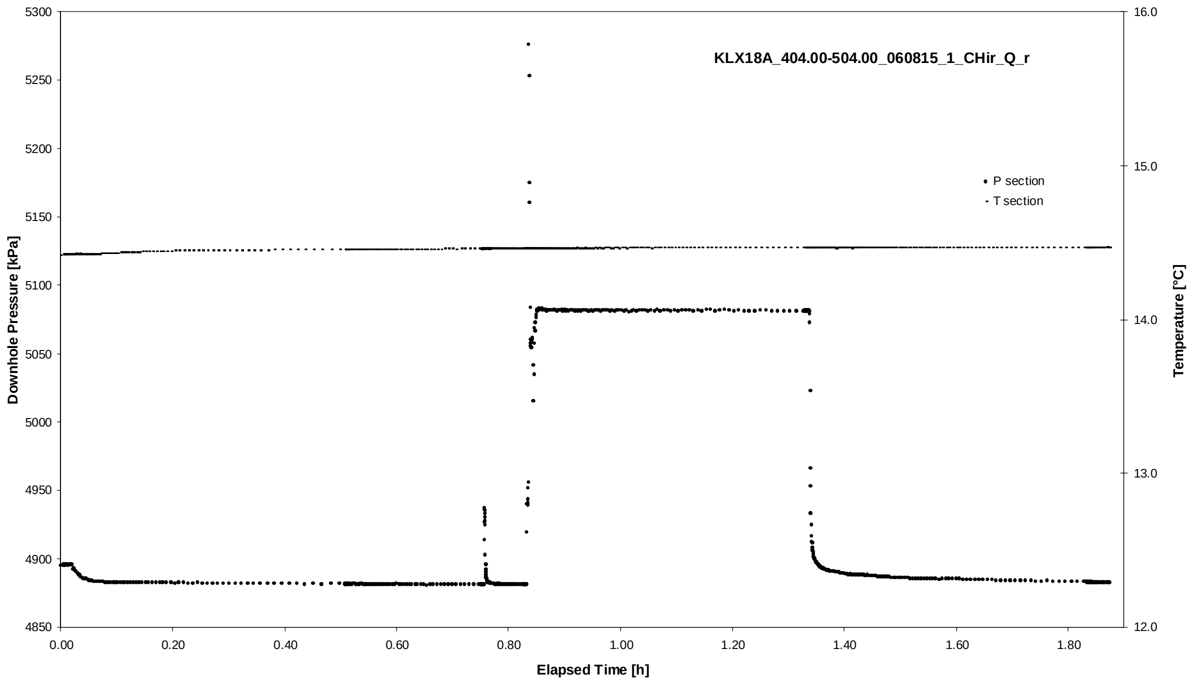
APPENDIX 2-4

Test 404.00 – 504.00 m

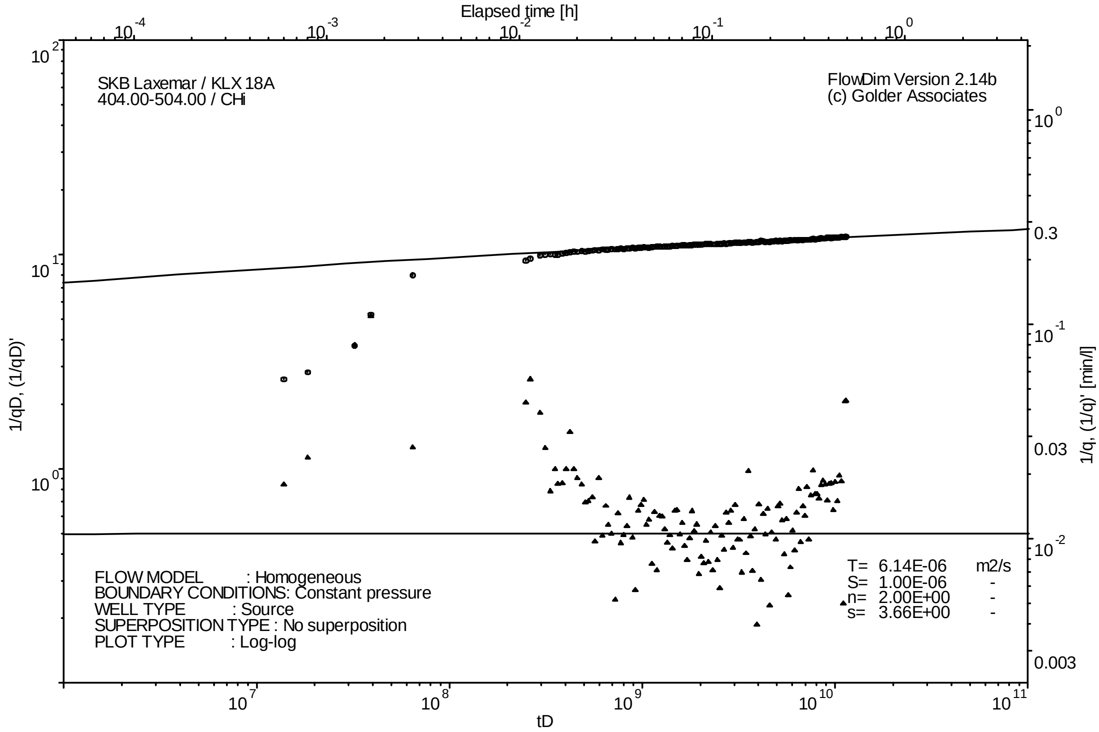
Analysis diagrams



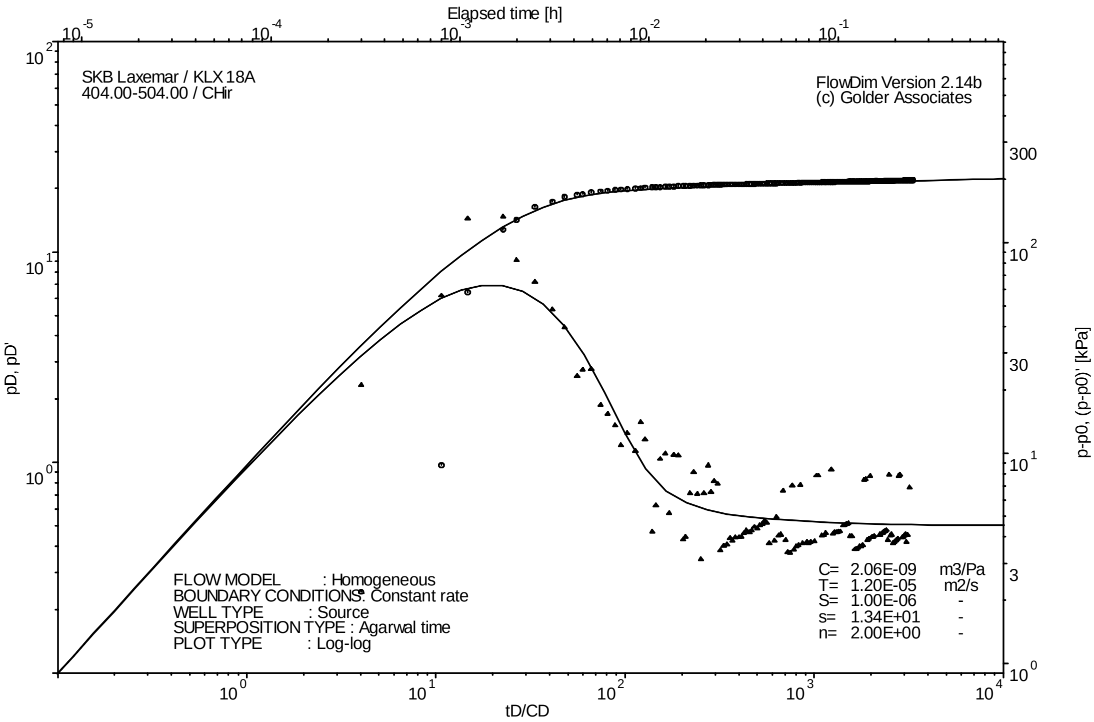
Pressure and flow rate vs. time; cartesian plot



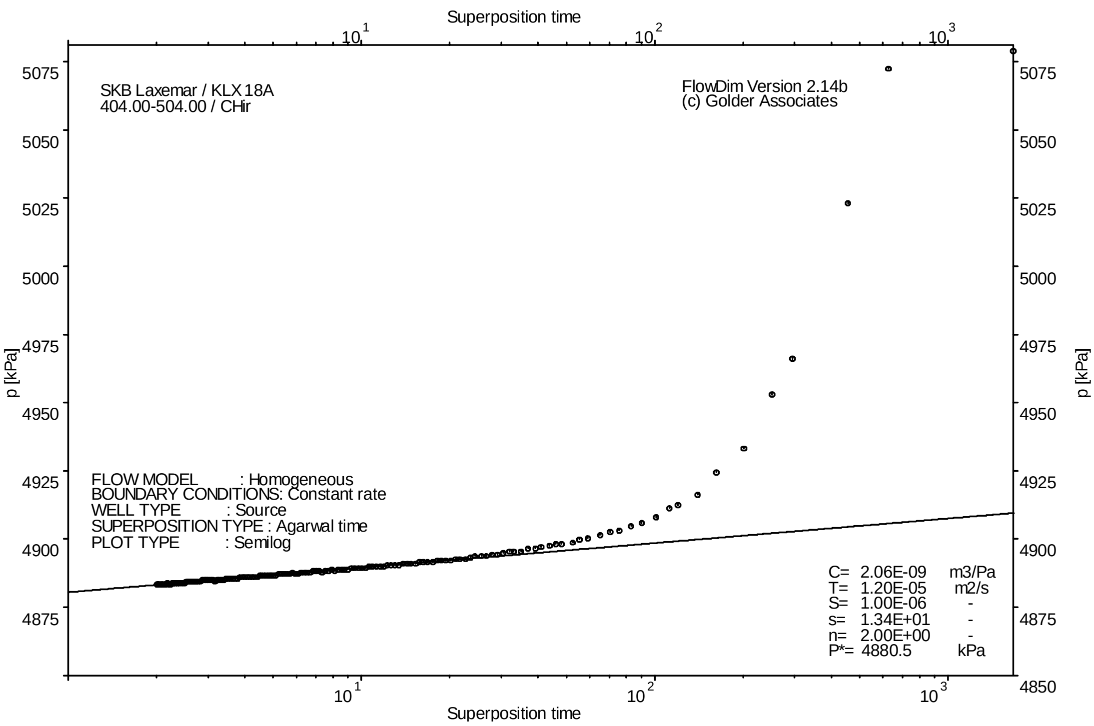
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

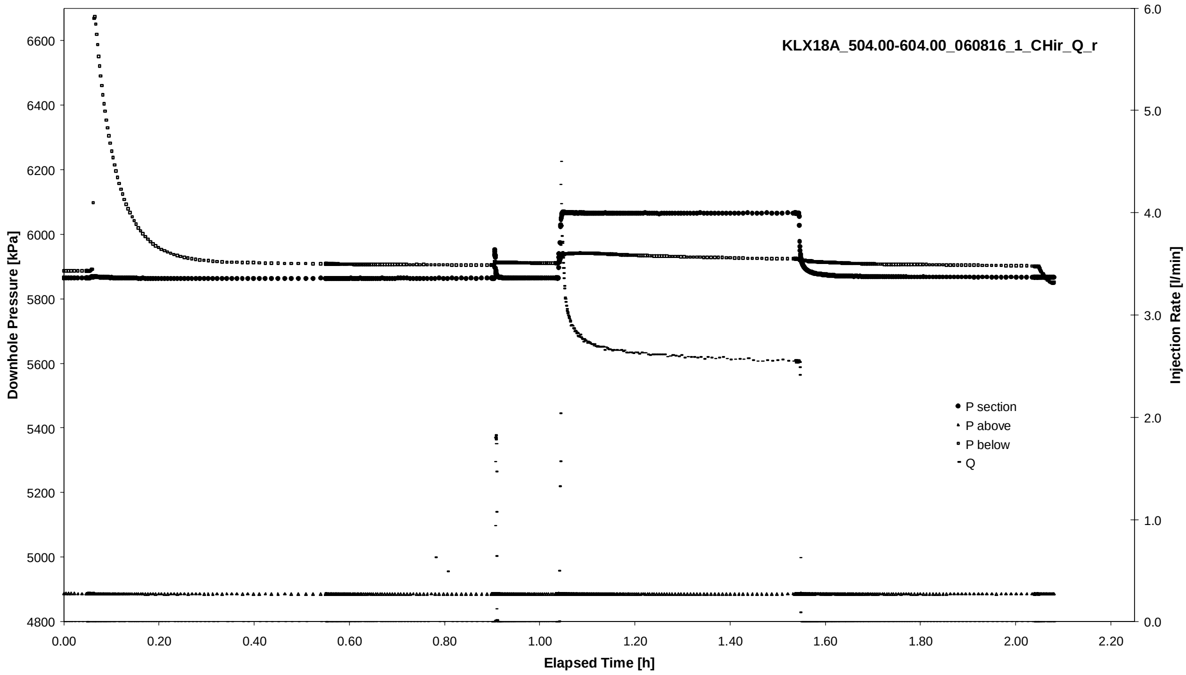


CHIR phase; HORNER match

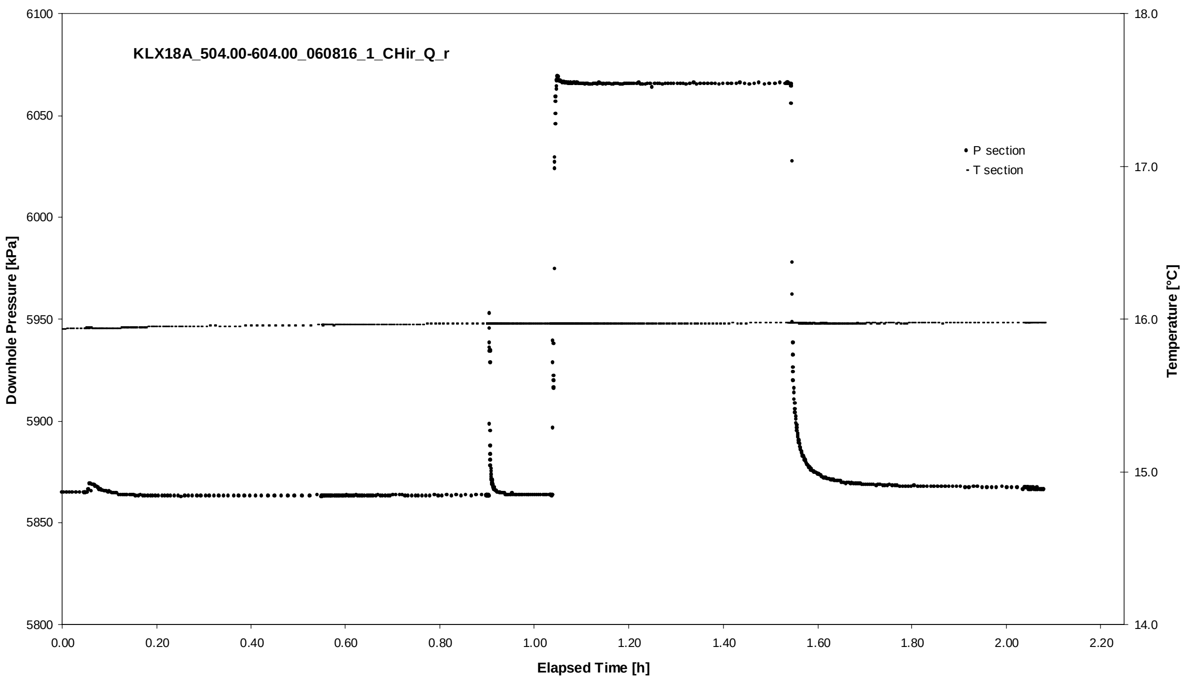
APPENDIX 2-5

Test 504.00 – 604.00 m

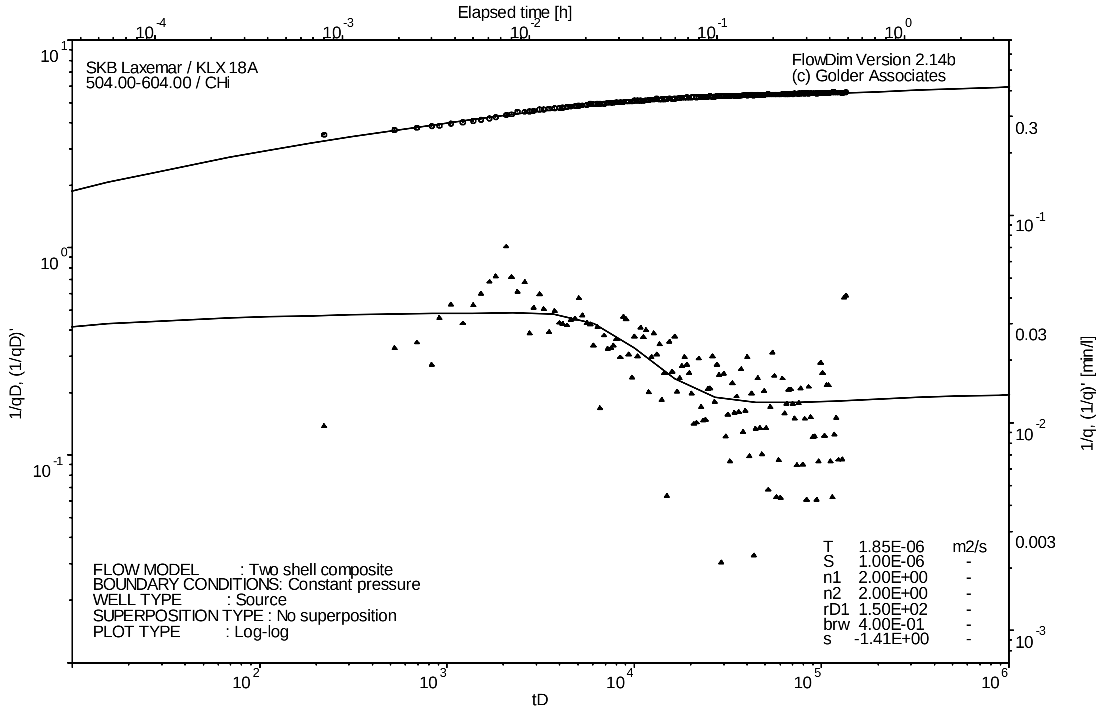
Analysis diagrams



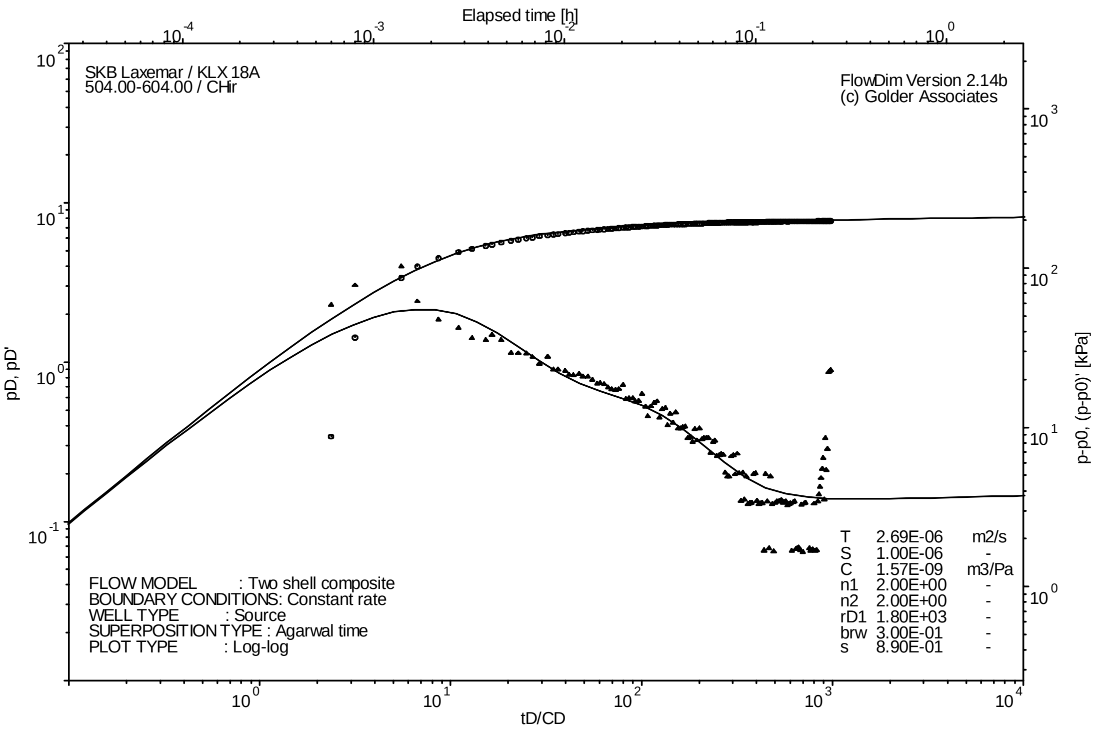
Pressure and flow rate vs. time; cartesian plot



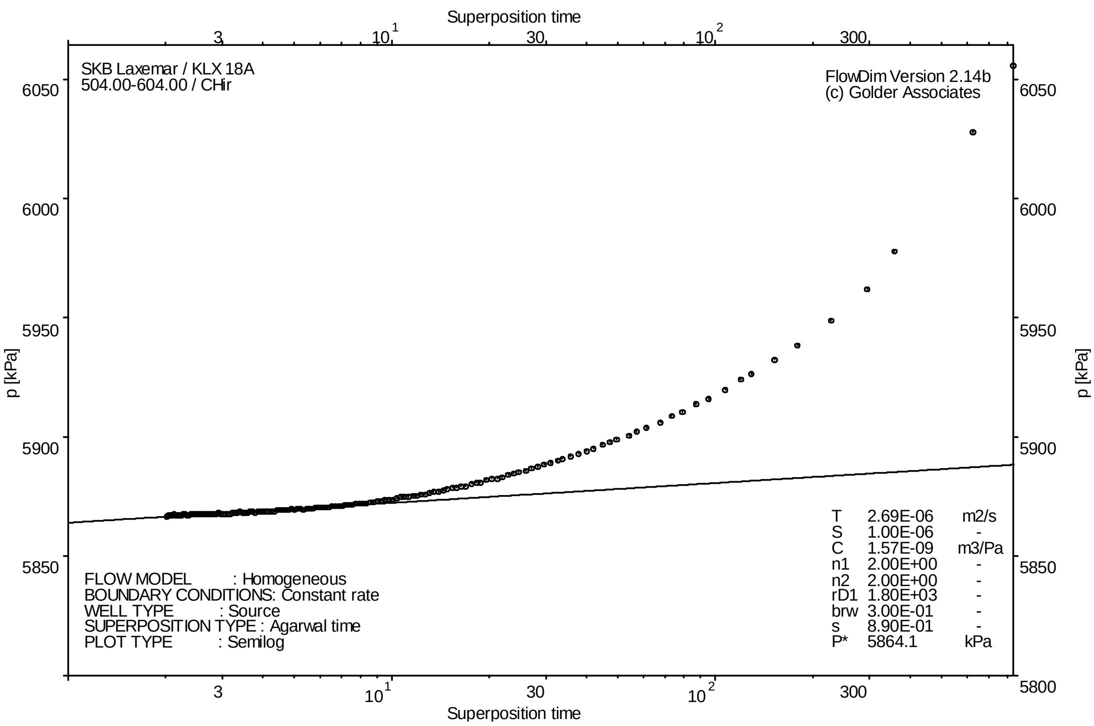
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

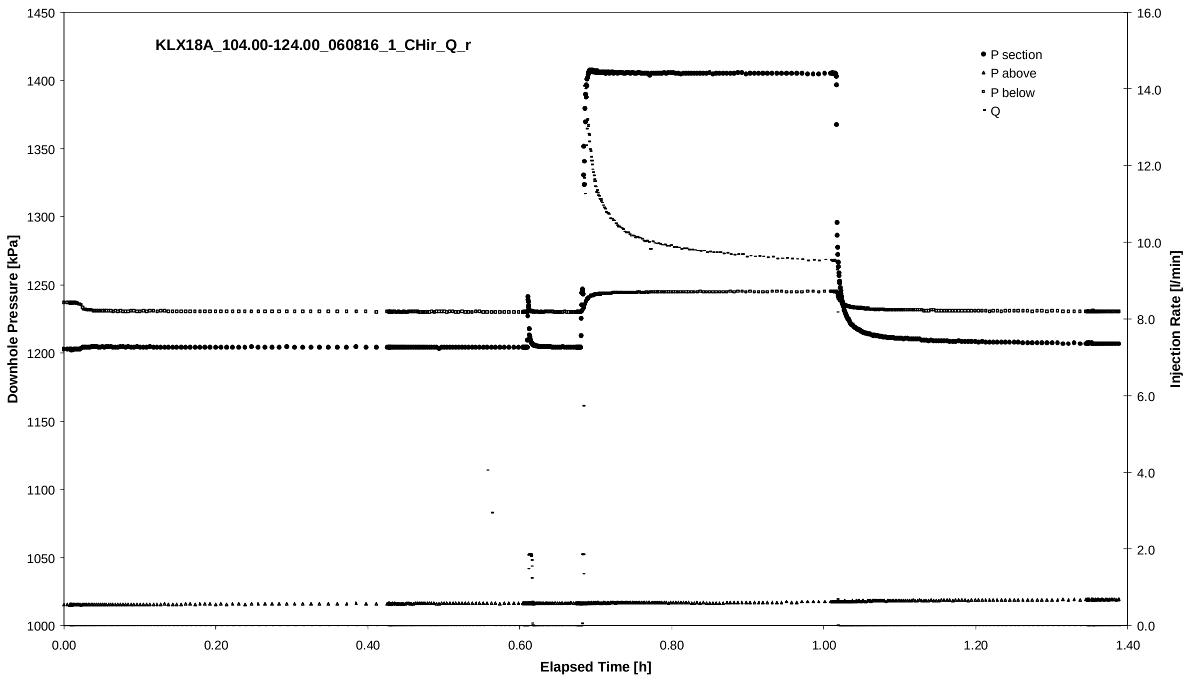


CHIR phase; HORNER match

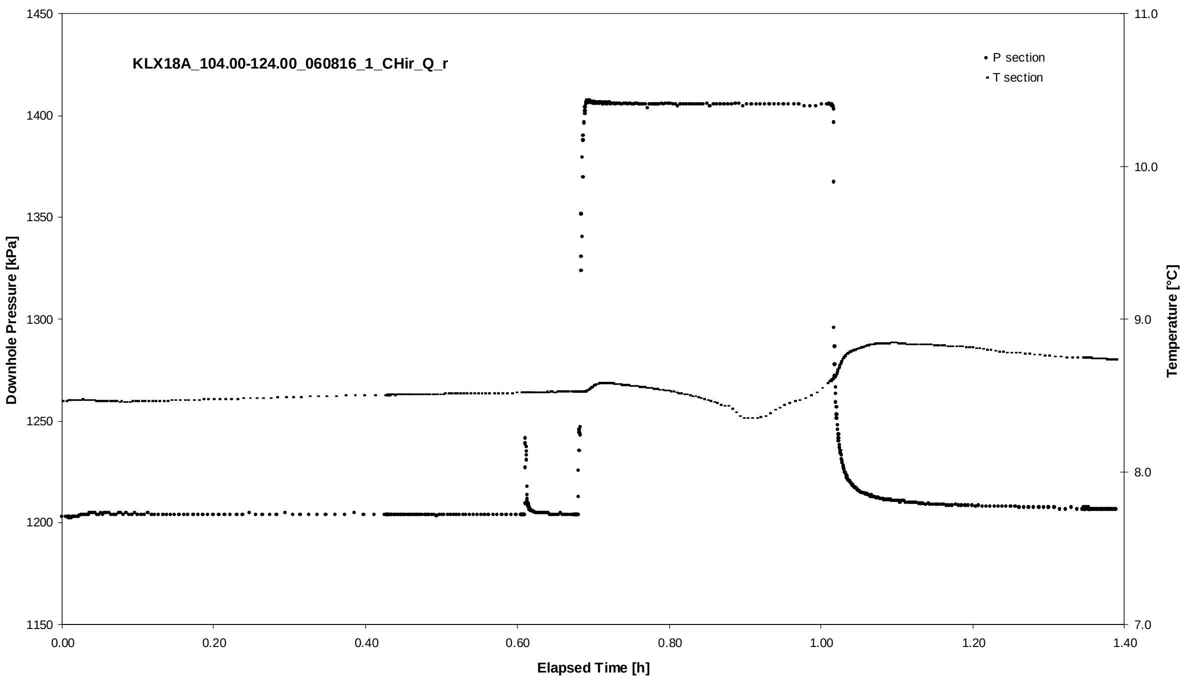
APPENDIX 2-6

Test 104.00 – 124.00 m

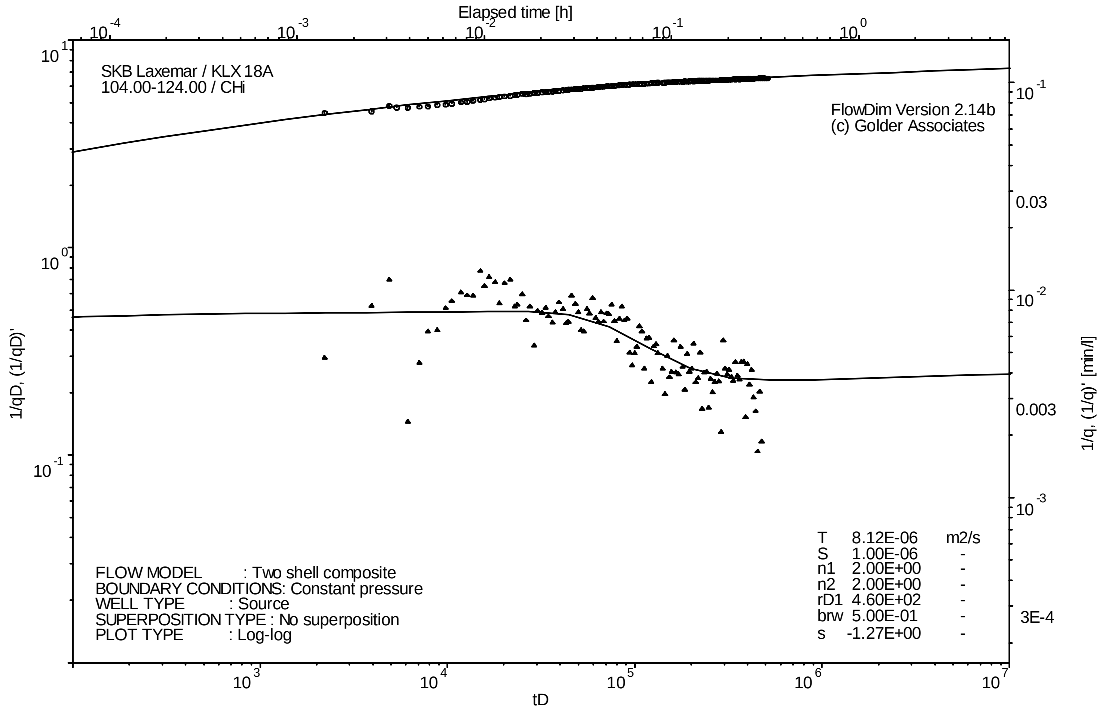
Analysis diagrams



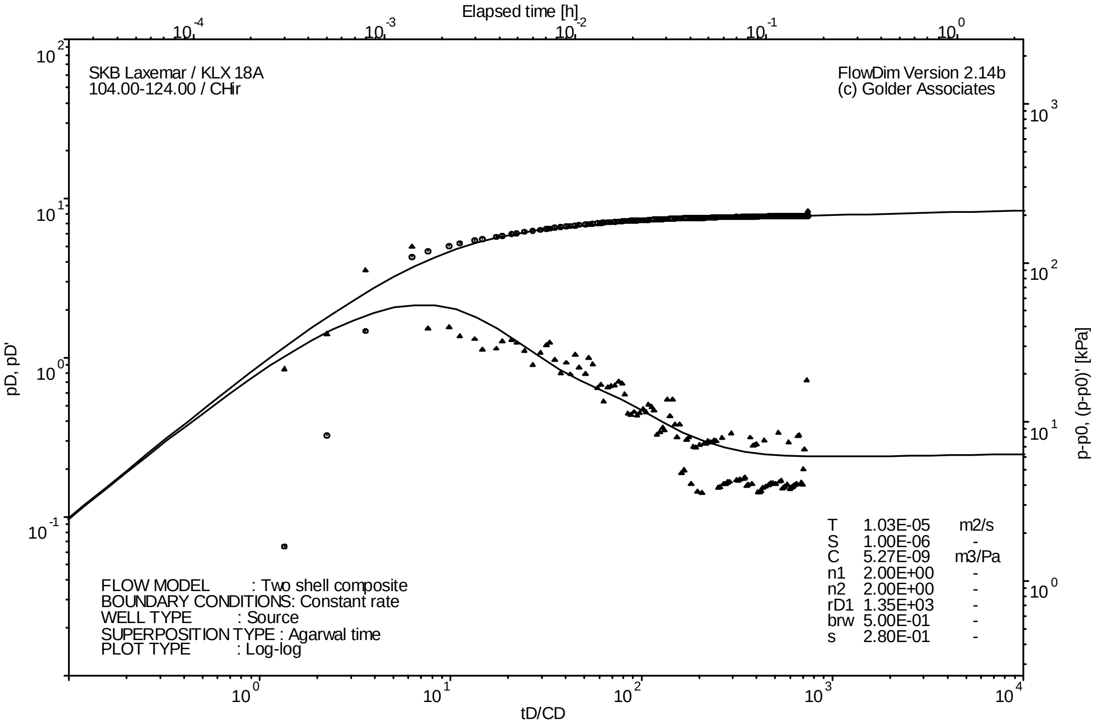
Pressure and flow rate vs. time; cartesian plot



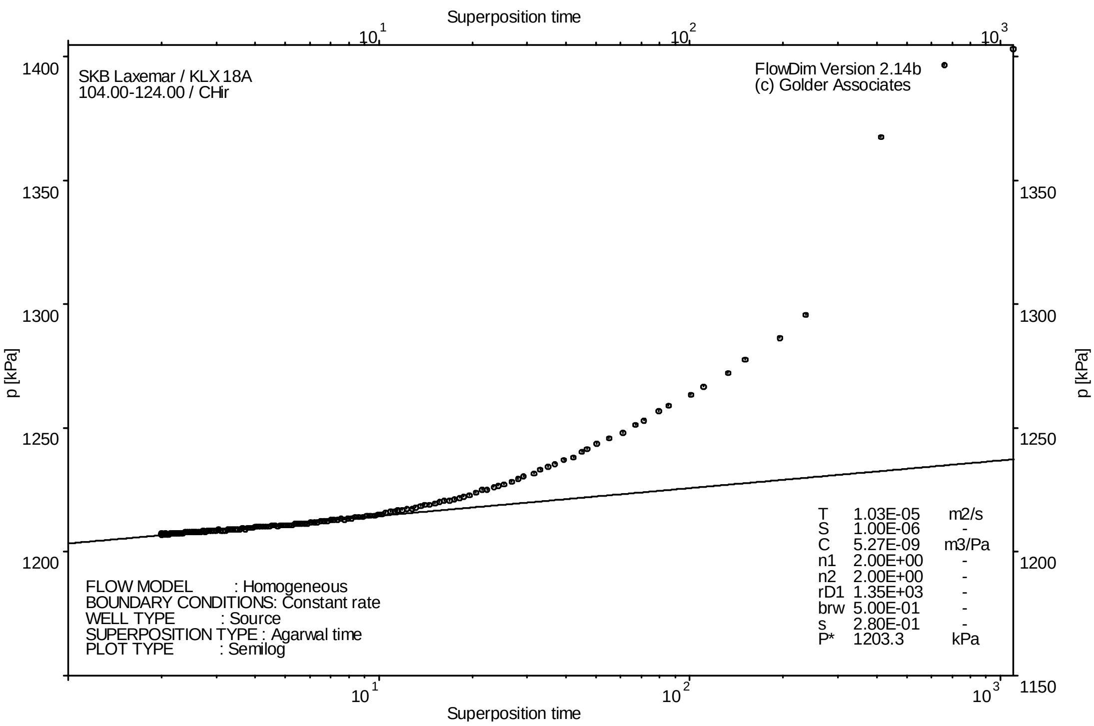
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

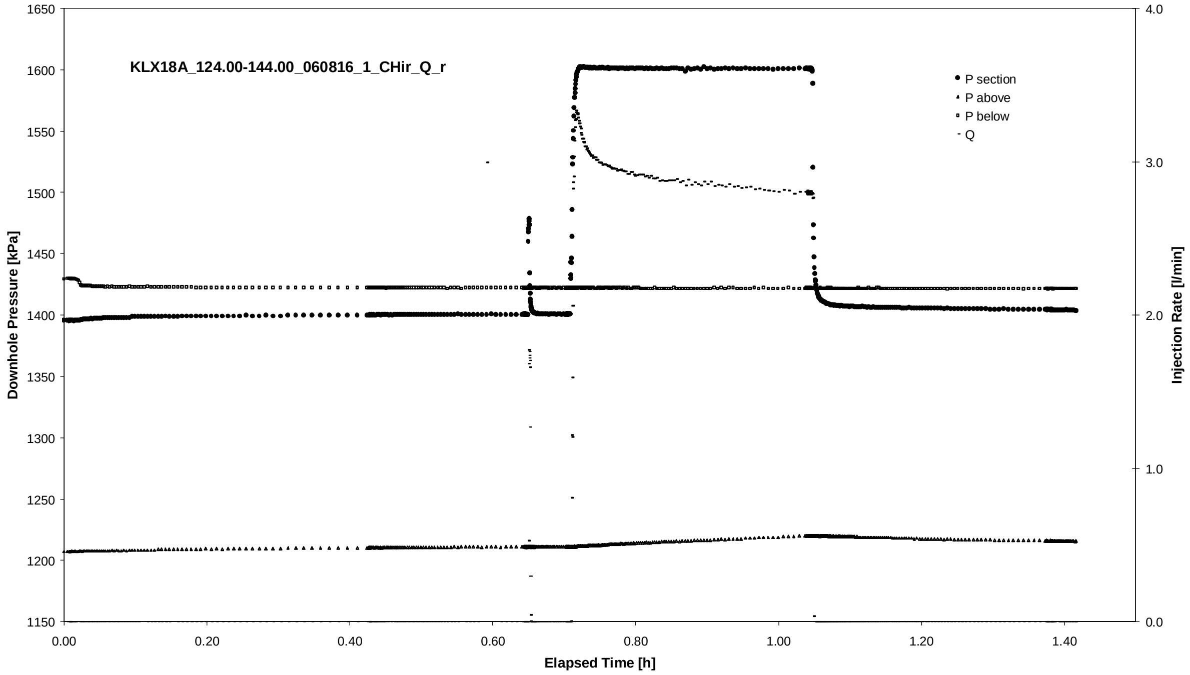


CHIR phase; HORNER match

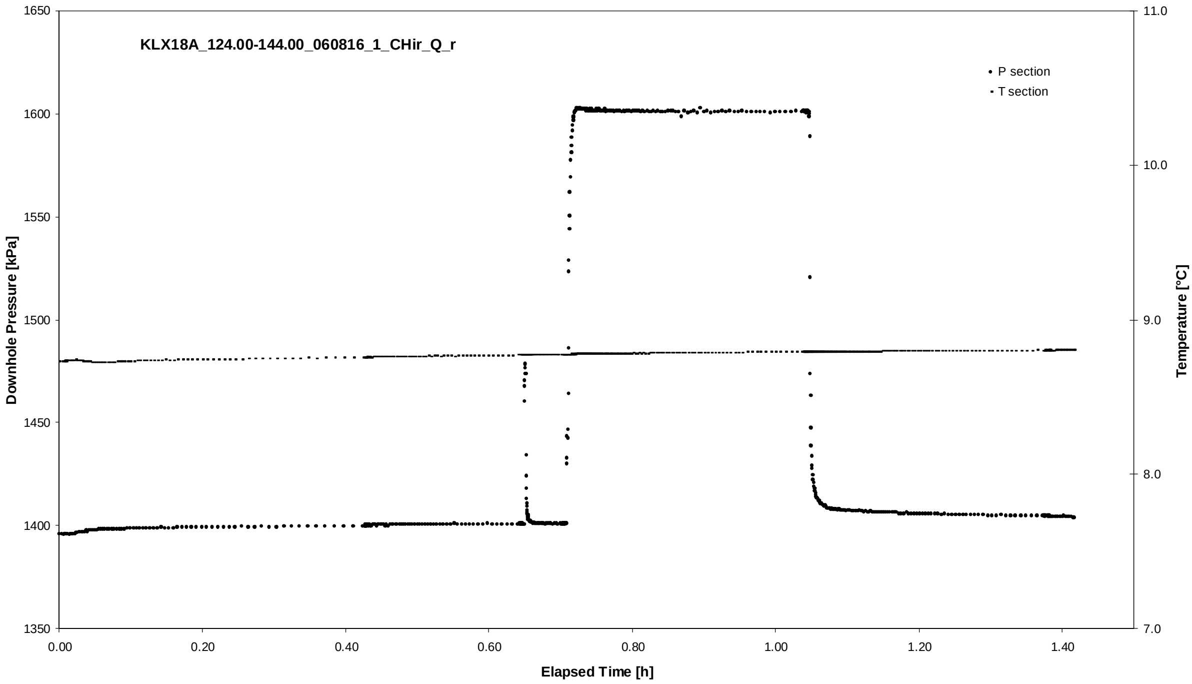
APPENDIX 2-7

Test 124.00 – 144.00 m

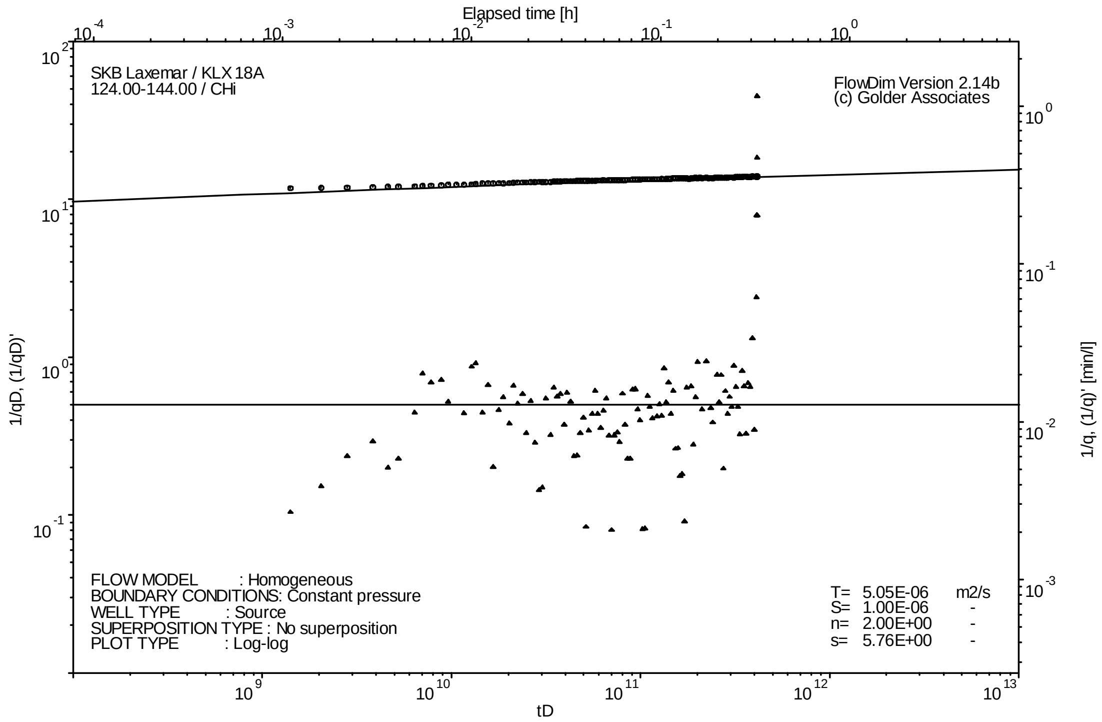
Analysis diagrams



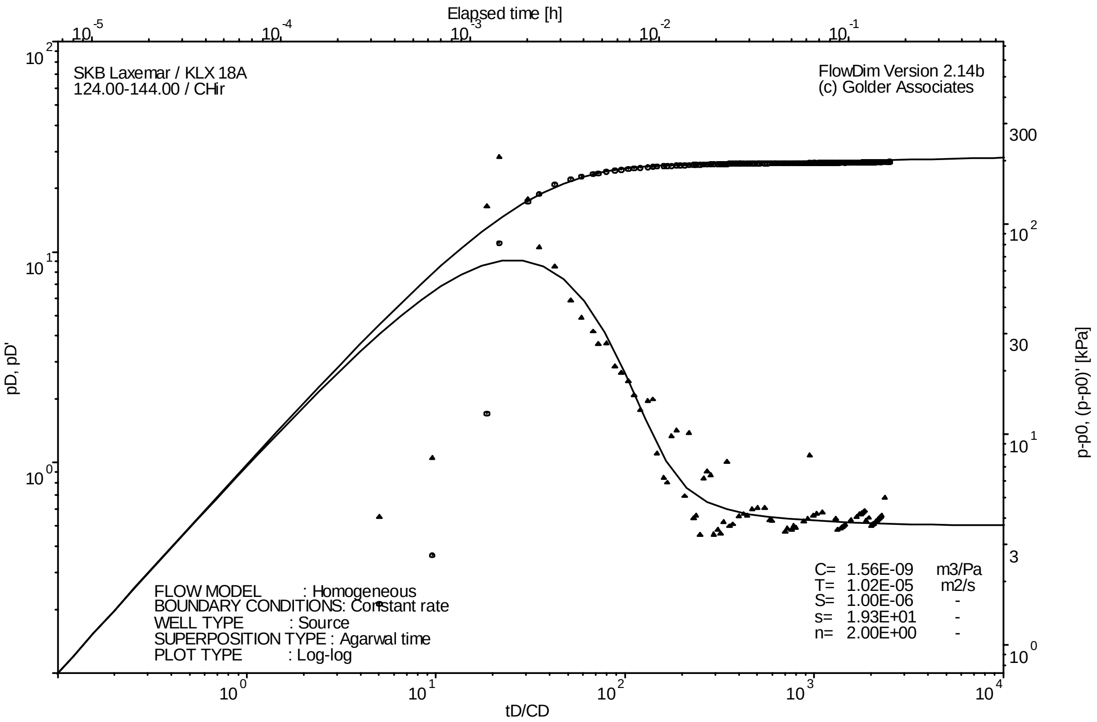
Pressure and flow rate vs. time; cartesian plot



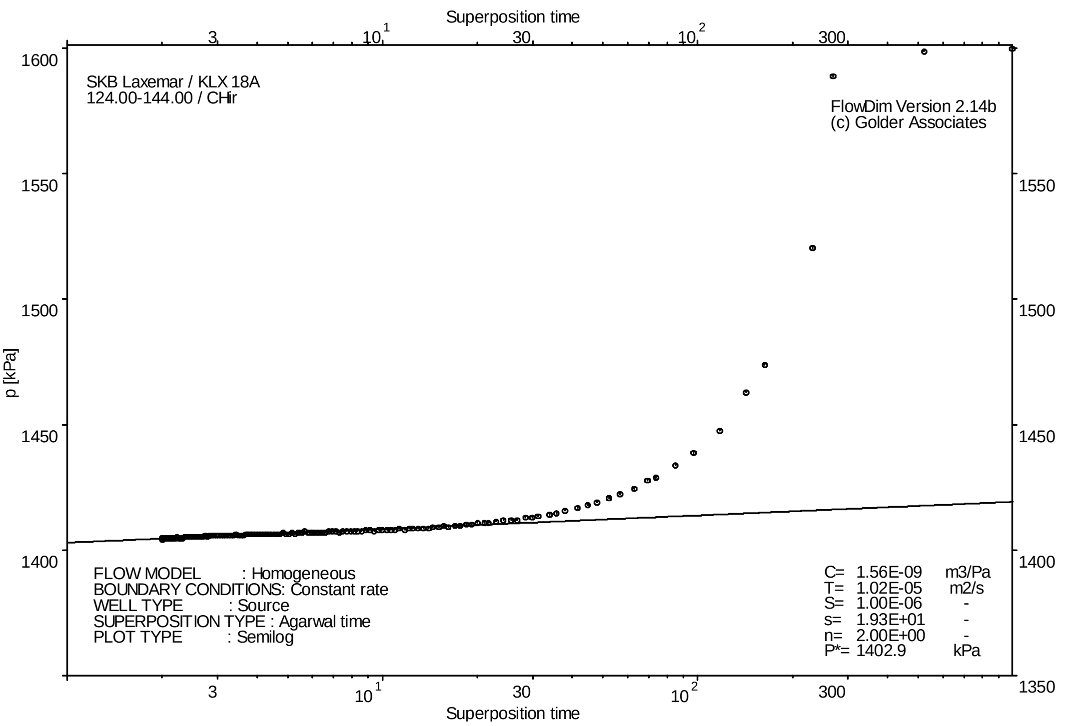
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

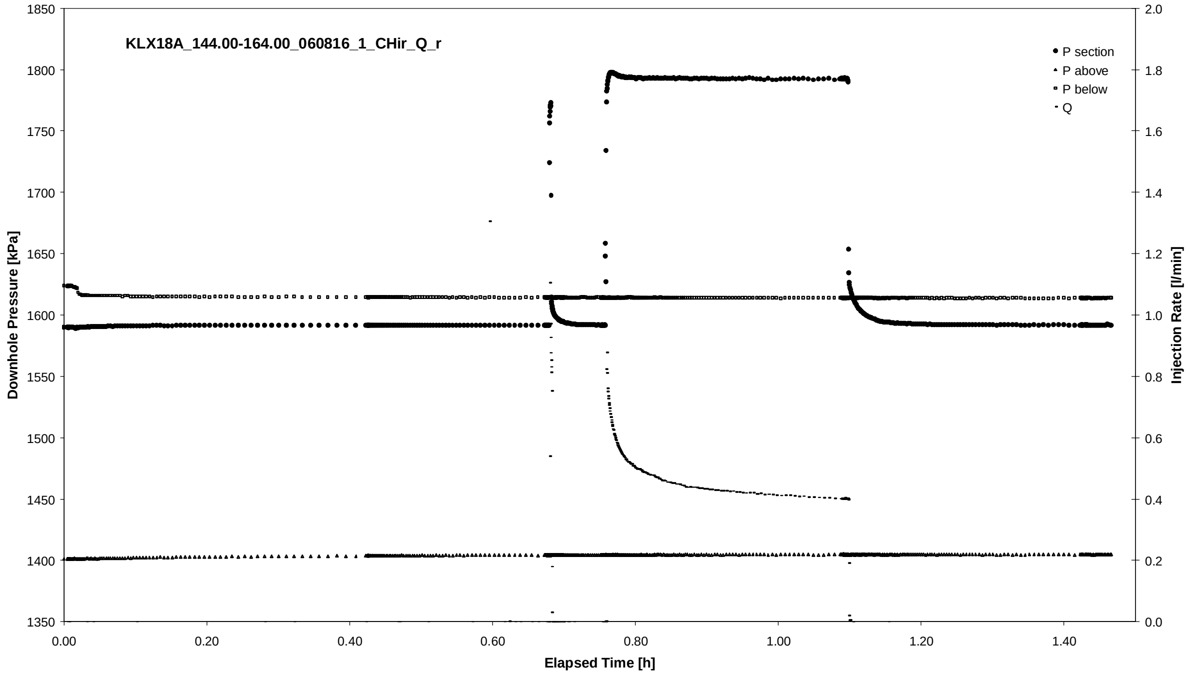


CHIR phase; HORNER match

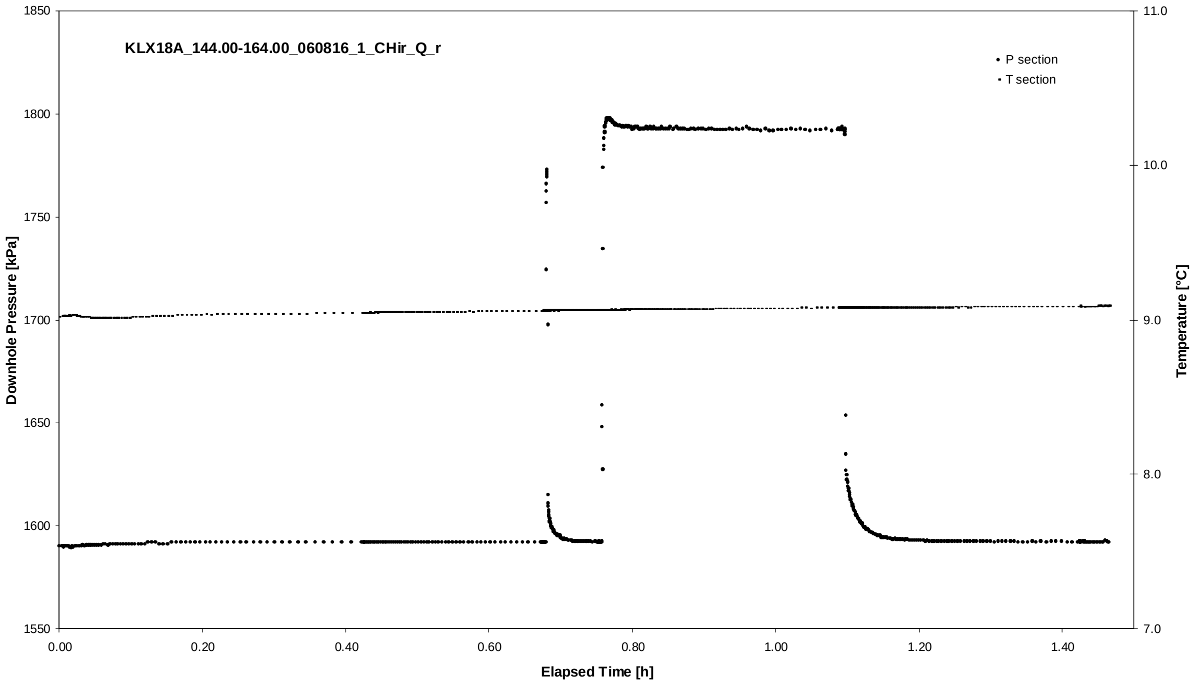
APPENDIX 2-8

Test 144.00 – 164.00 m

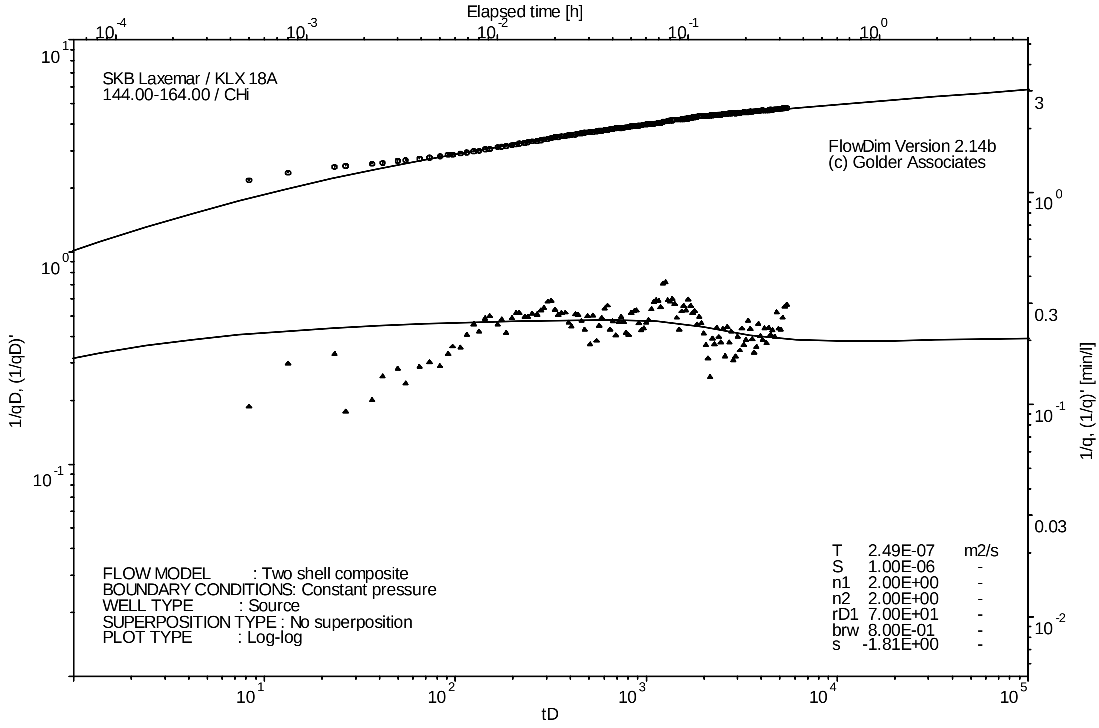
Analysis diagrams



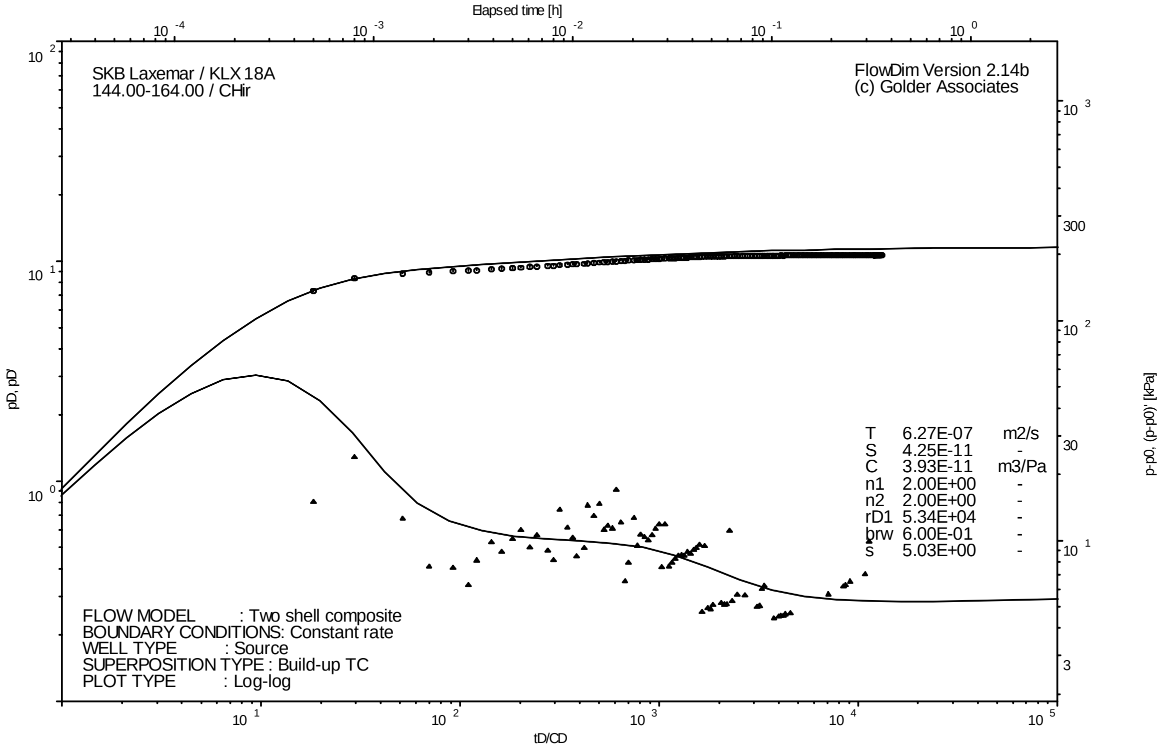
Pressure and flow rate vs. time; cartesian plot



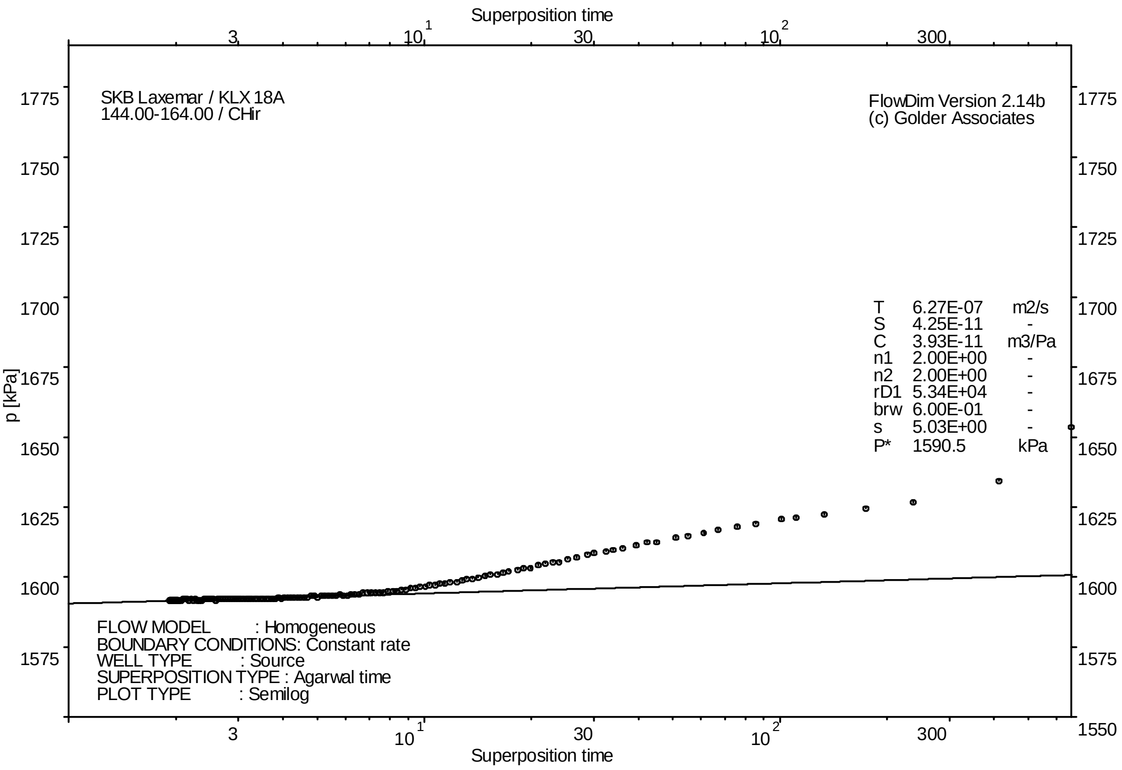
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

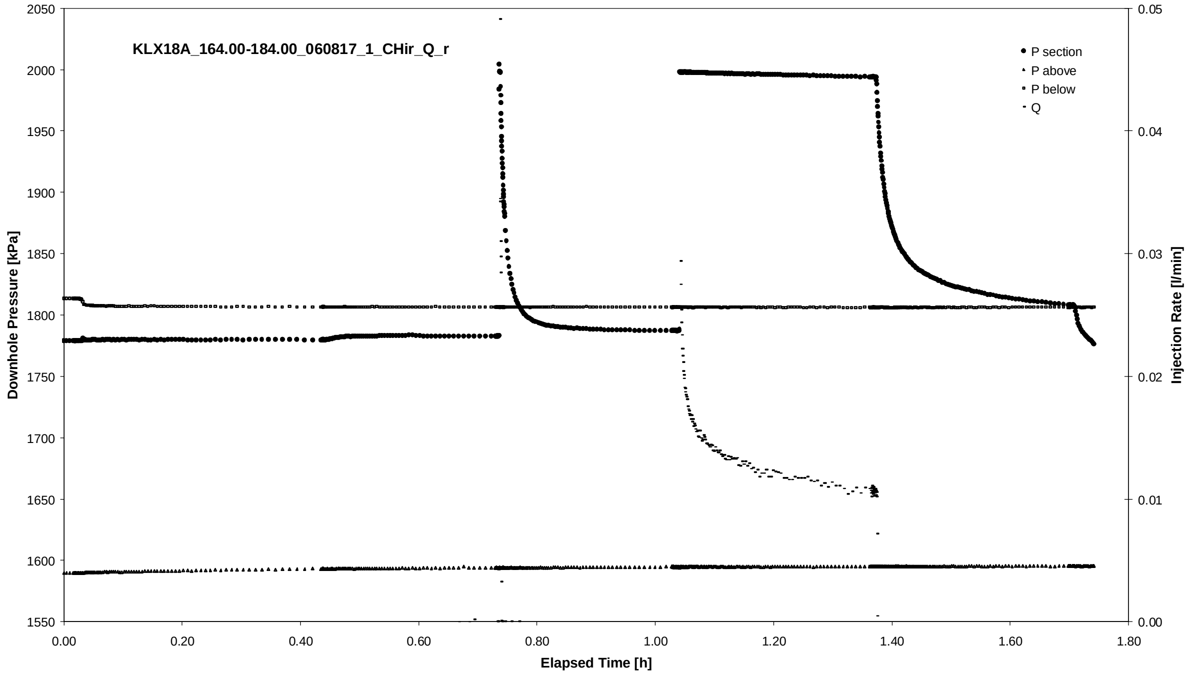


CHIR phase; HORNER match

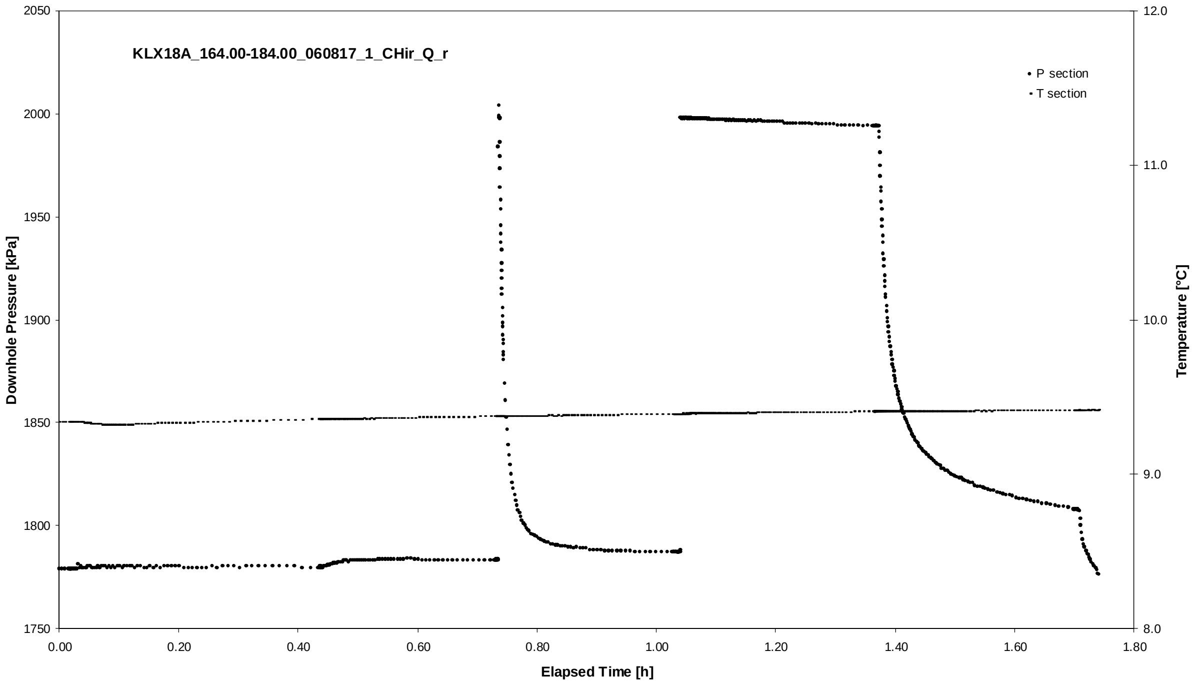
APPENDIX 2-9

Test 164.00 – 184.00 m

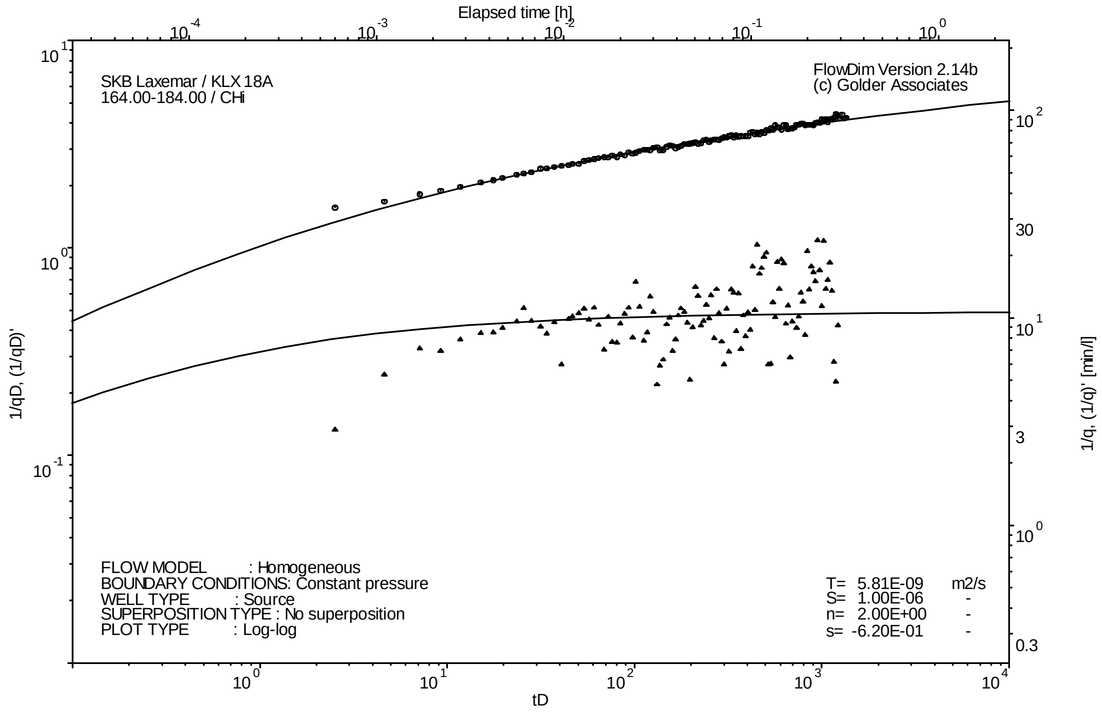
Analysis diagrams



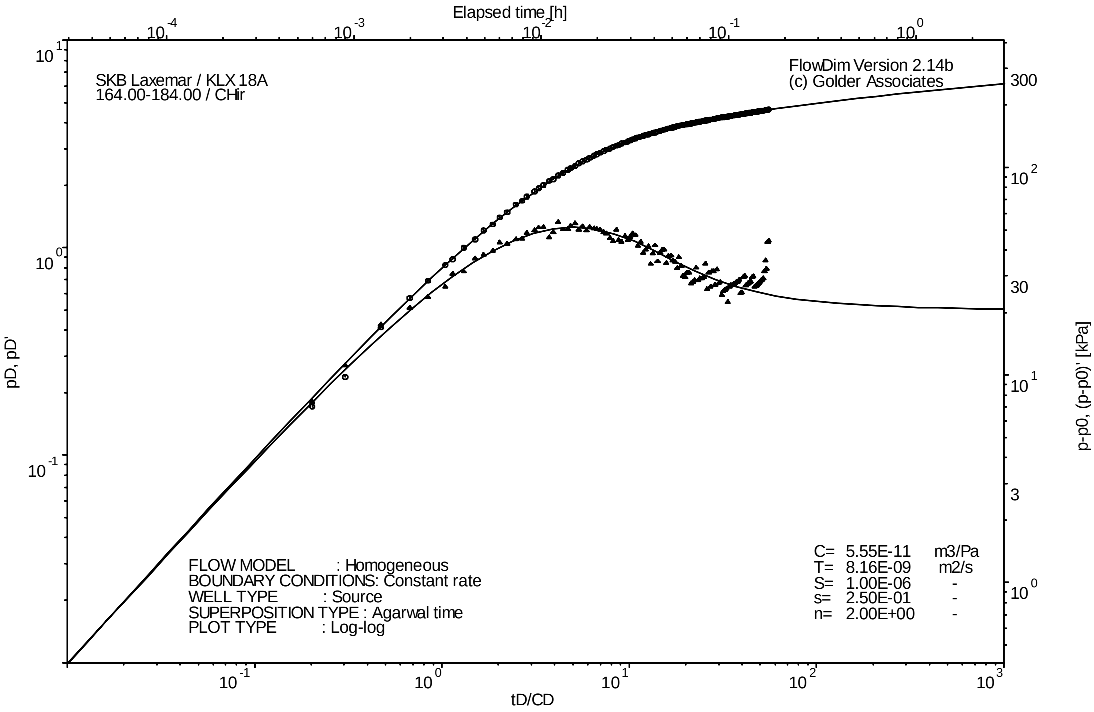
Pressure and flow rate vs. time; cartesian plot



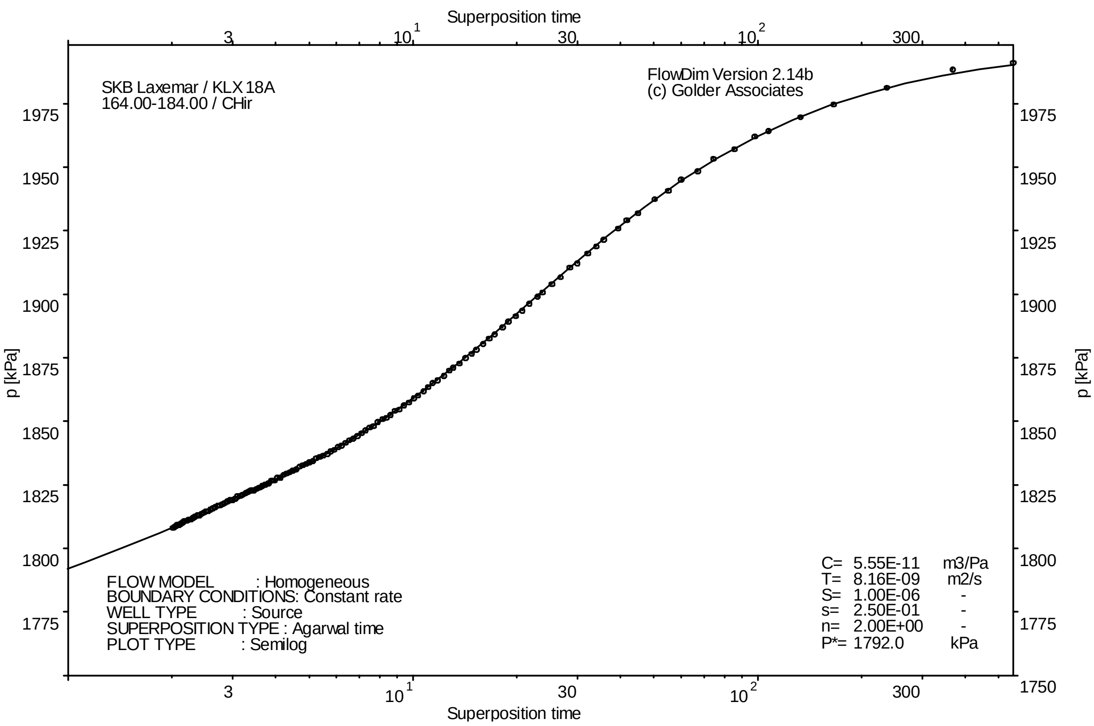
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

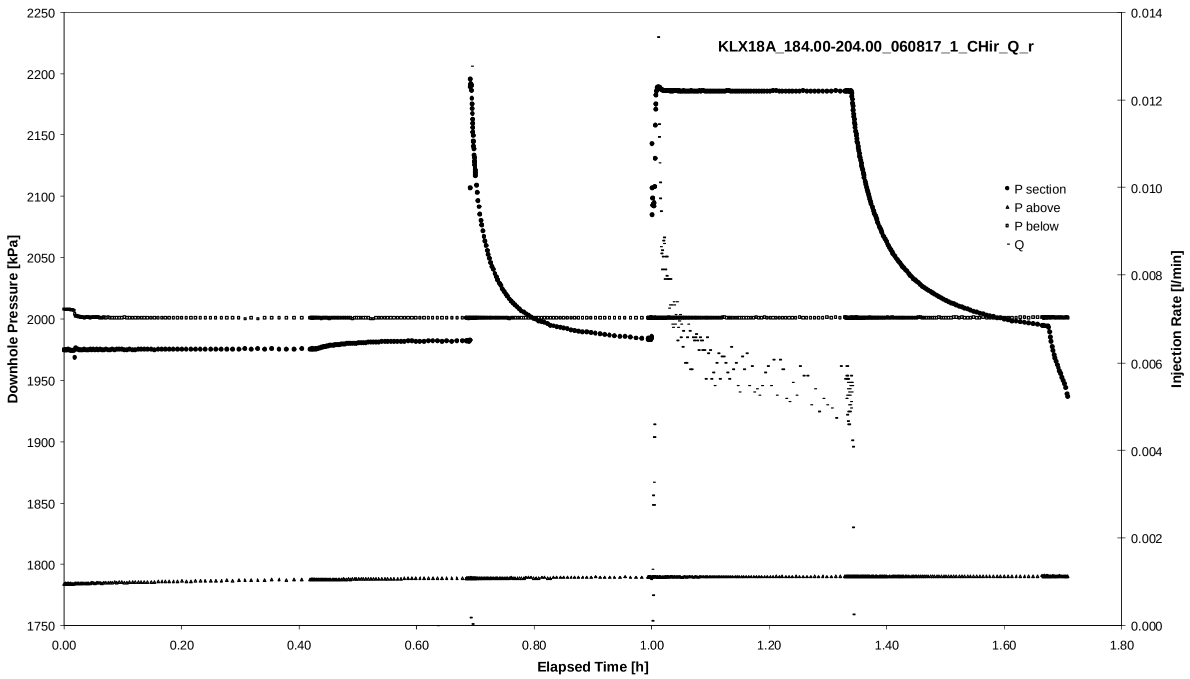


CHIR phase; HORNER match

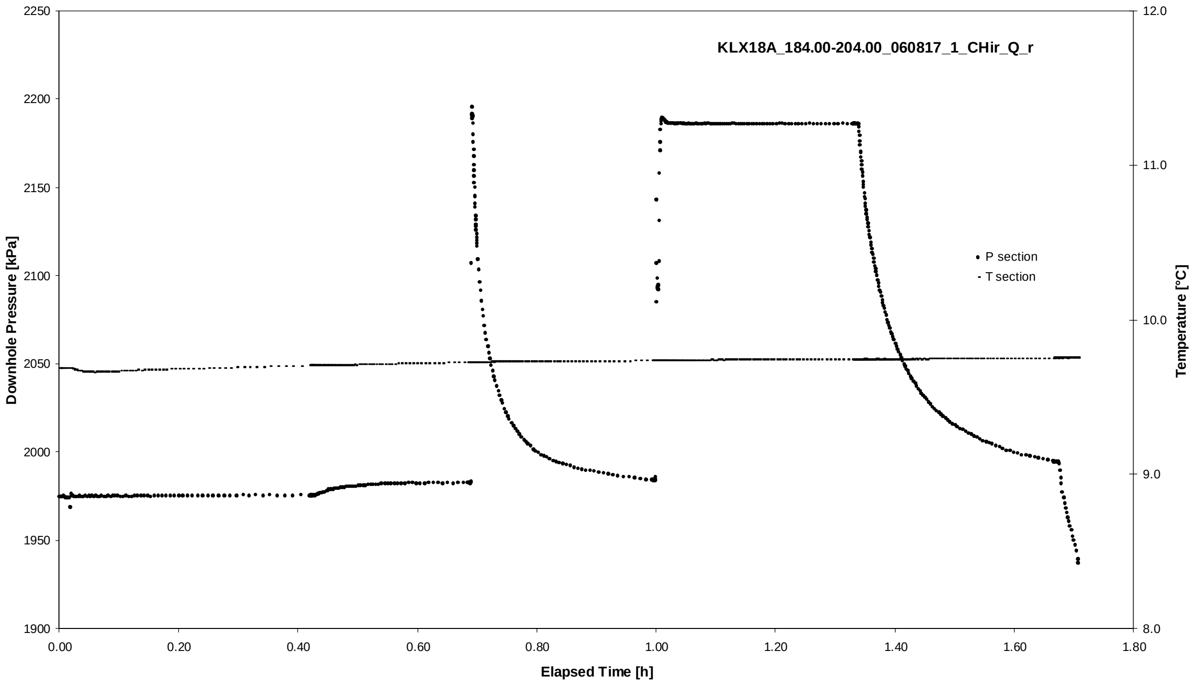
APPENDIX 2-10

Test 184.00 – 204.00 m

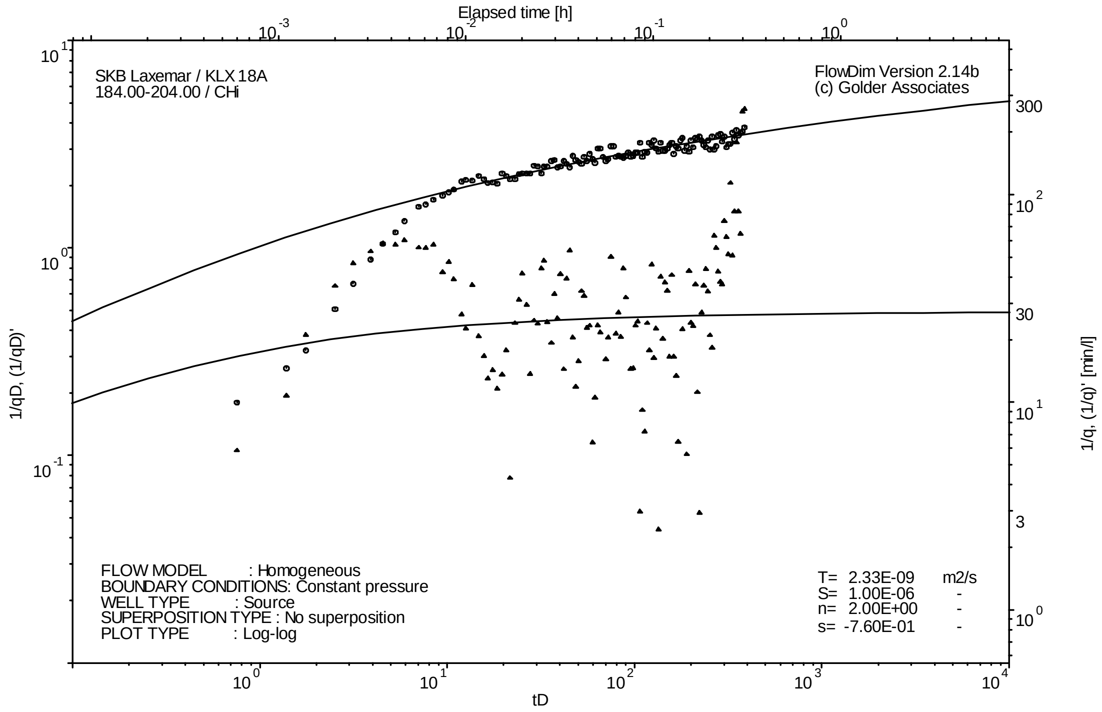
Analysis diagrams



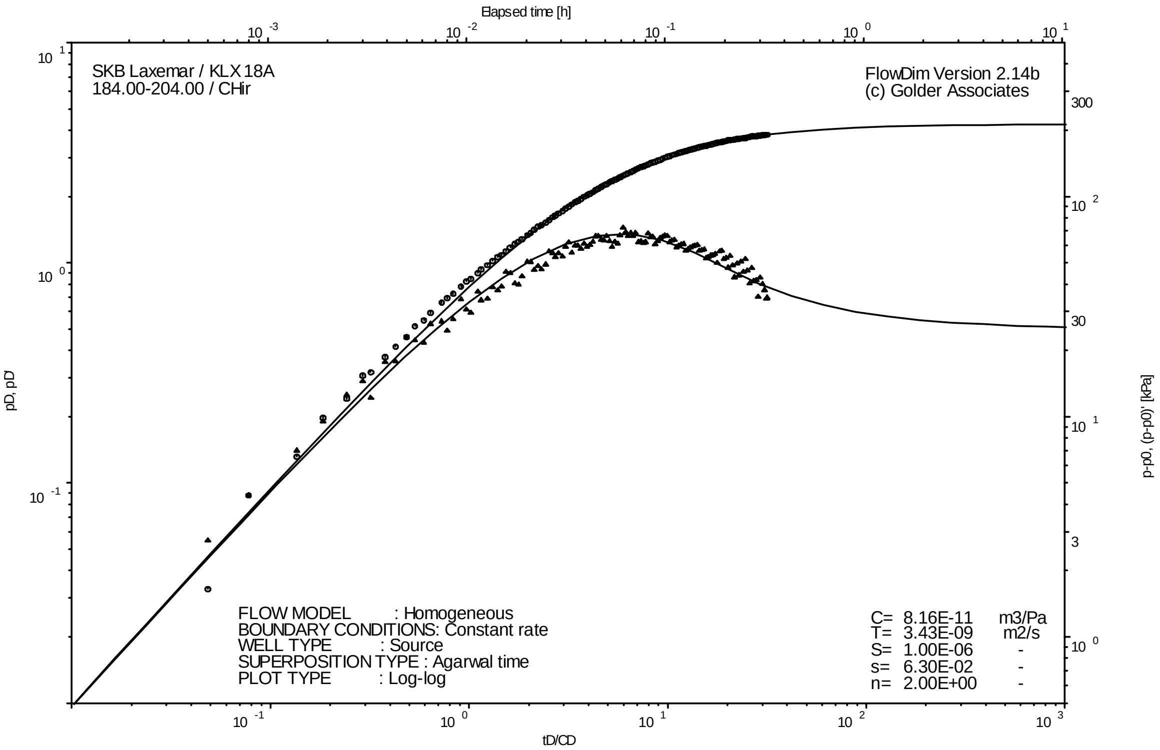
Pressure and flow rate vs. time; cartesian plot



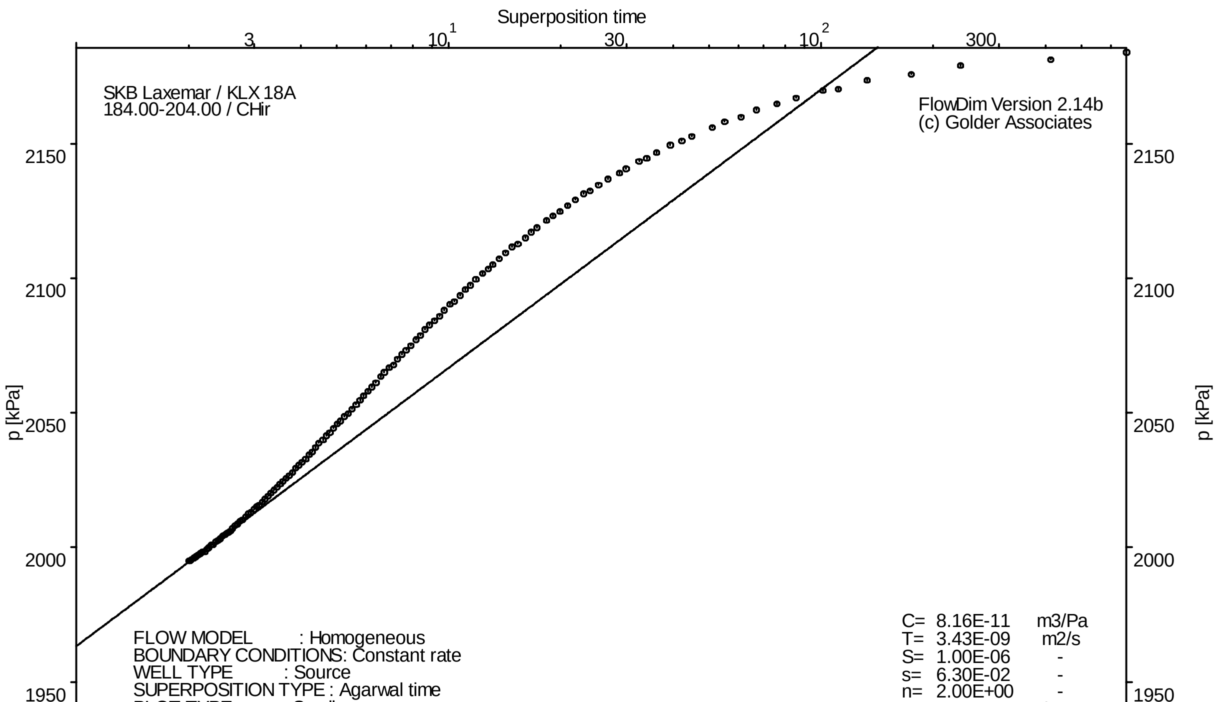
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

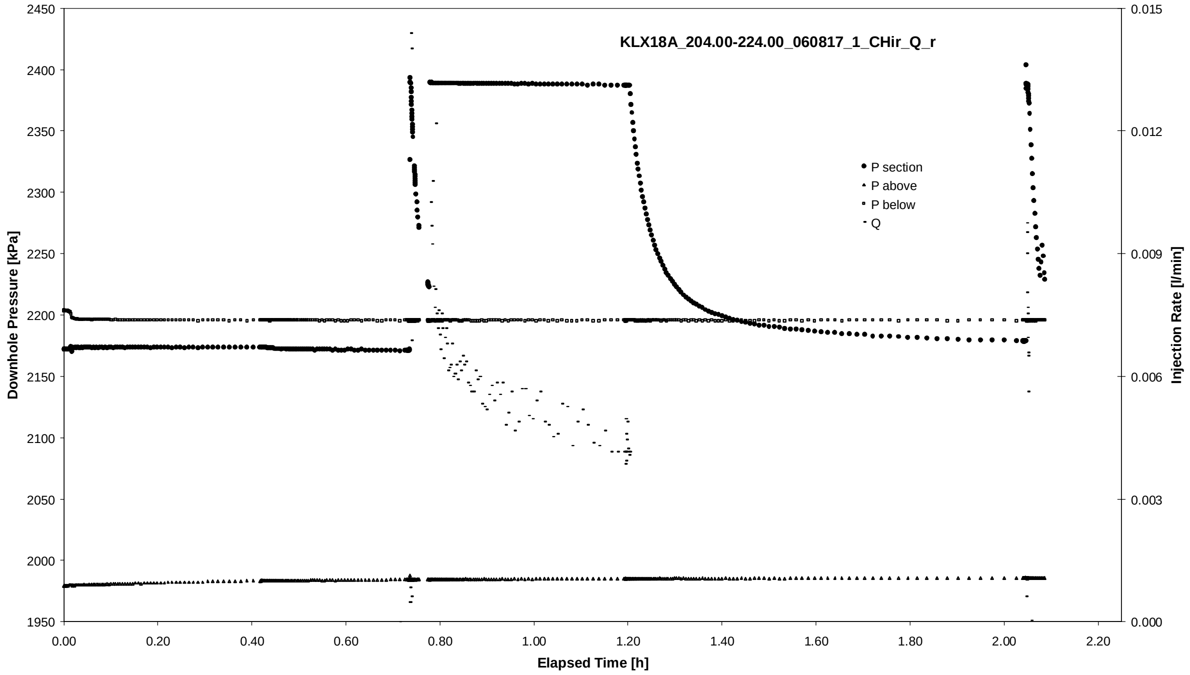


CHIR phase; HORNER match

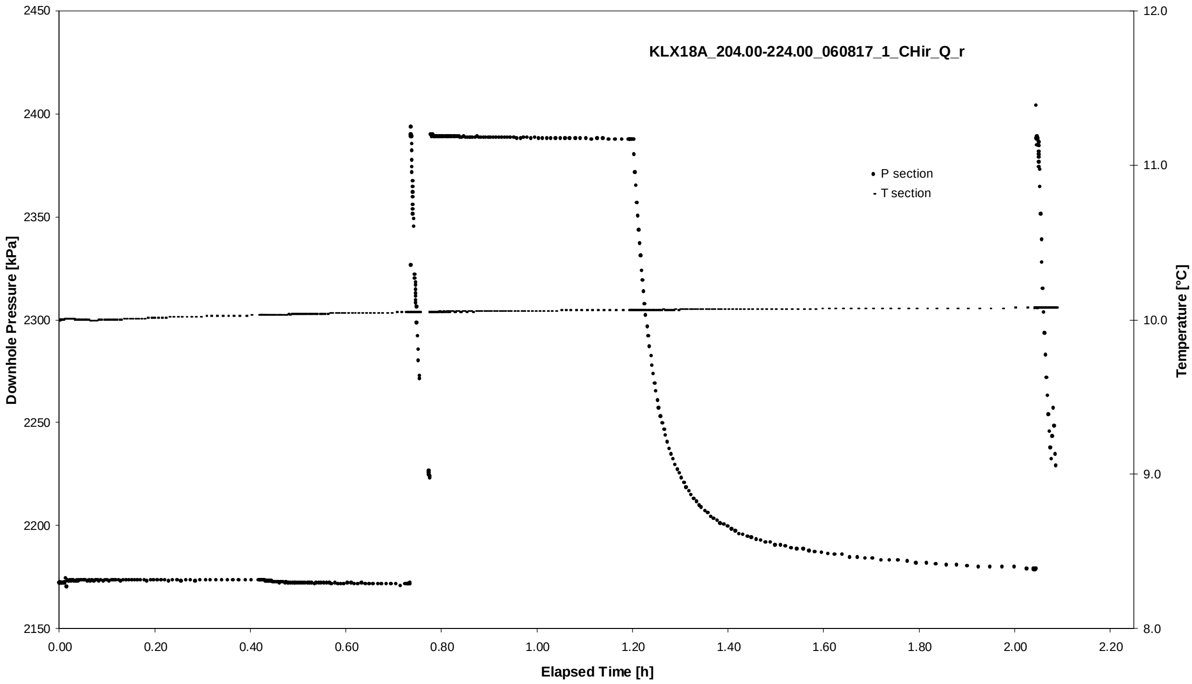
APPENDIX 2-11

Test 204.00 – 224.00 m

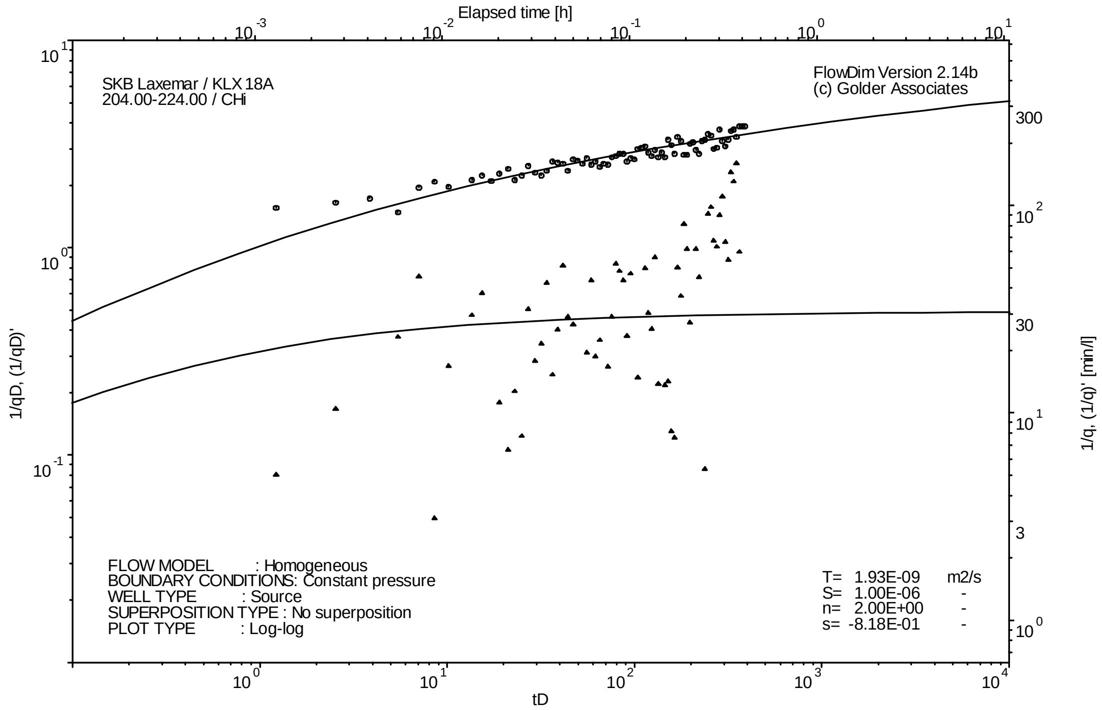
Analysis diagrams



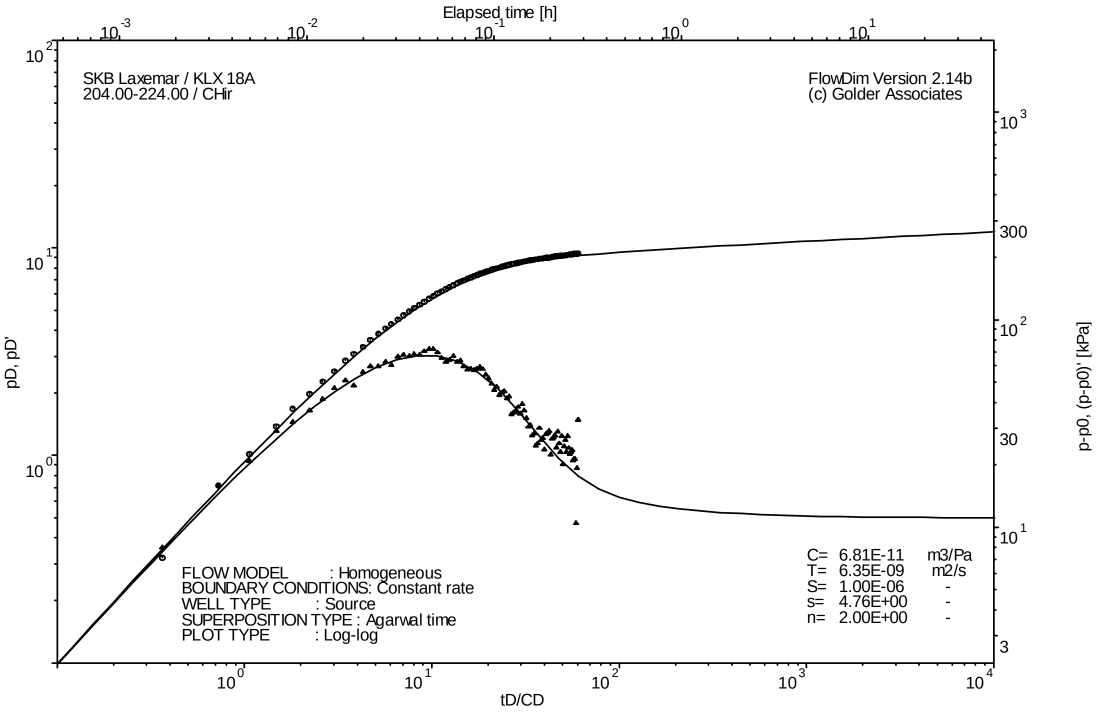
Pressure and flow rate vs. time; cartesian plot



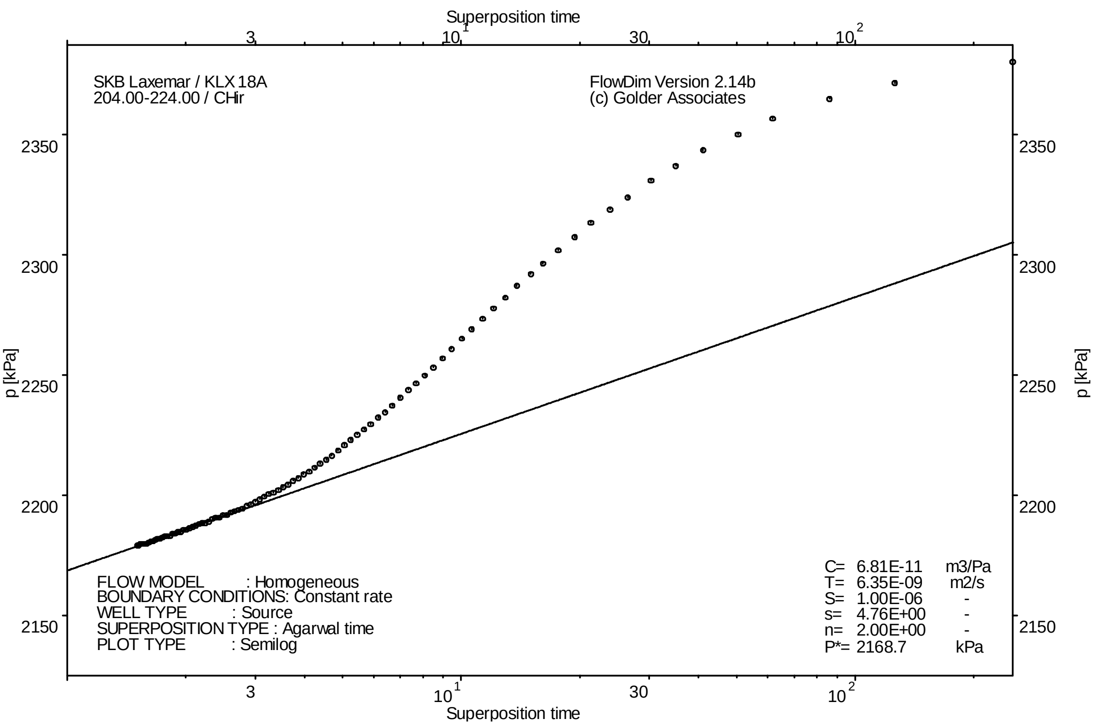
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

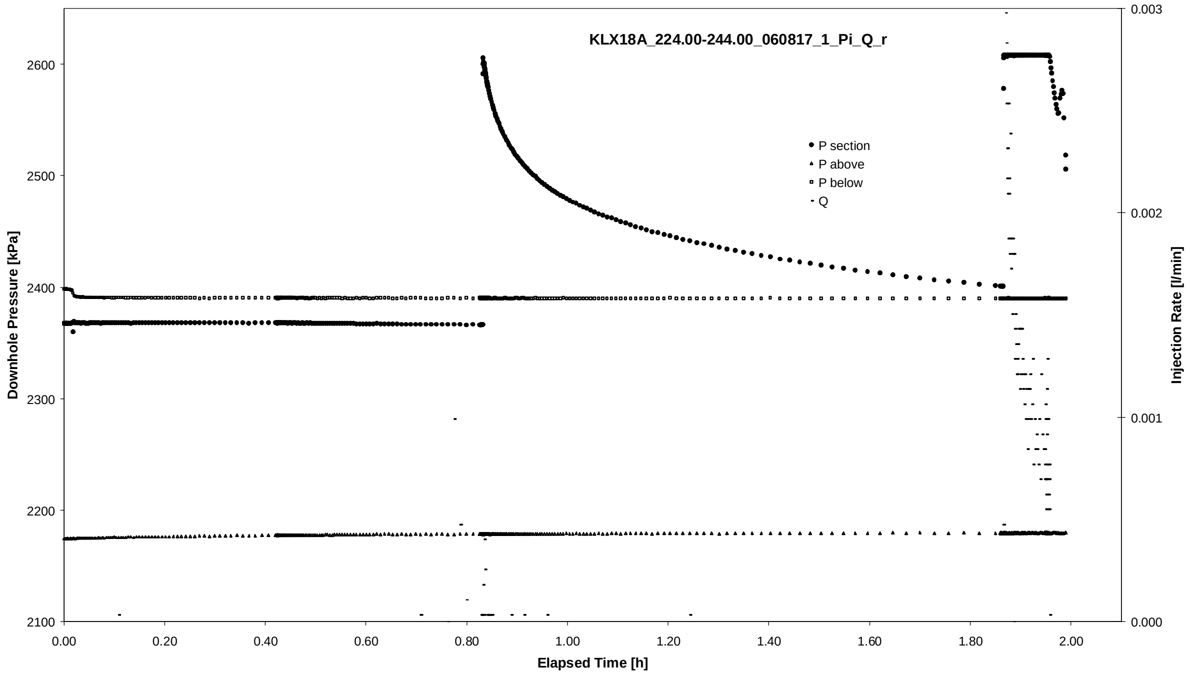


CHIR phase; HORNER match

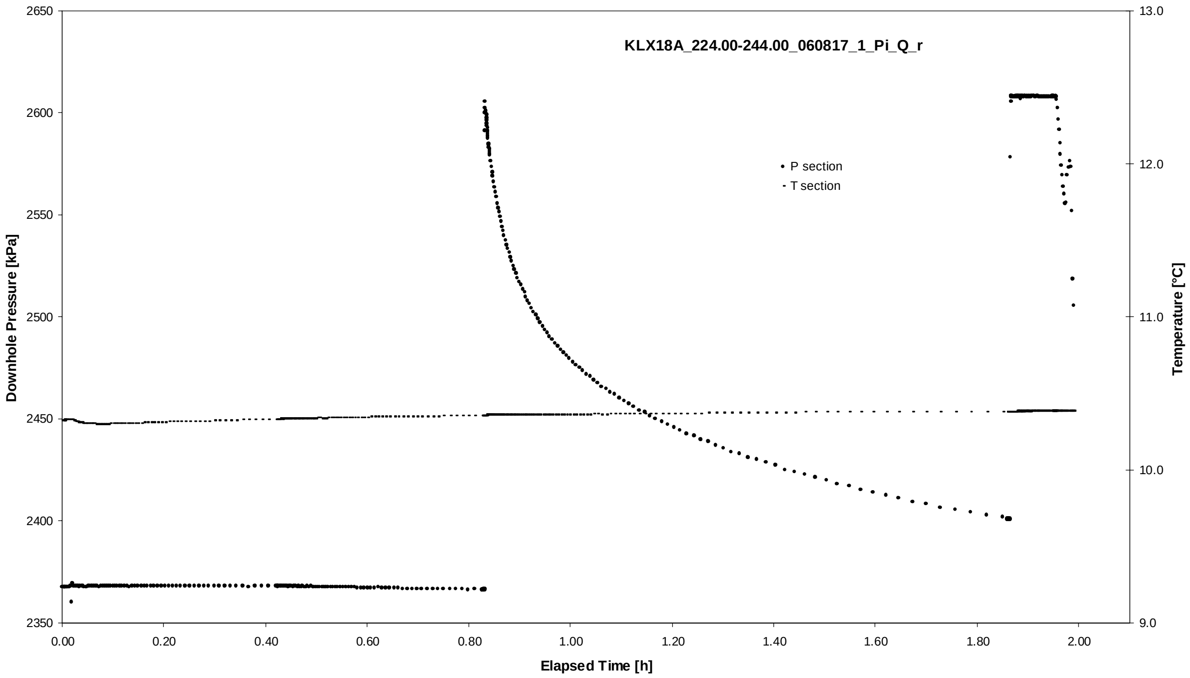
APPENDIX 2-12

Test 224.00 – 244.00 m

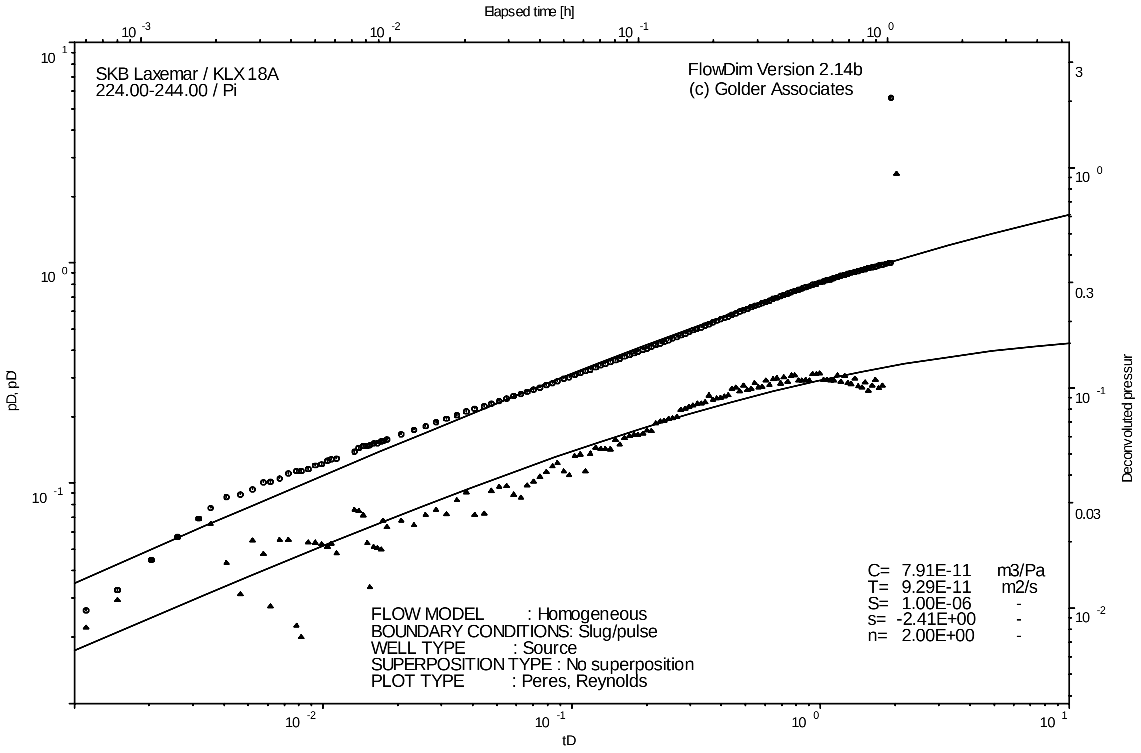
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

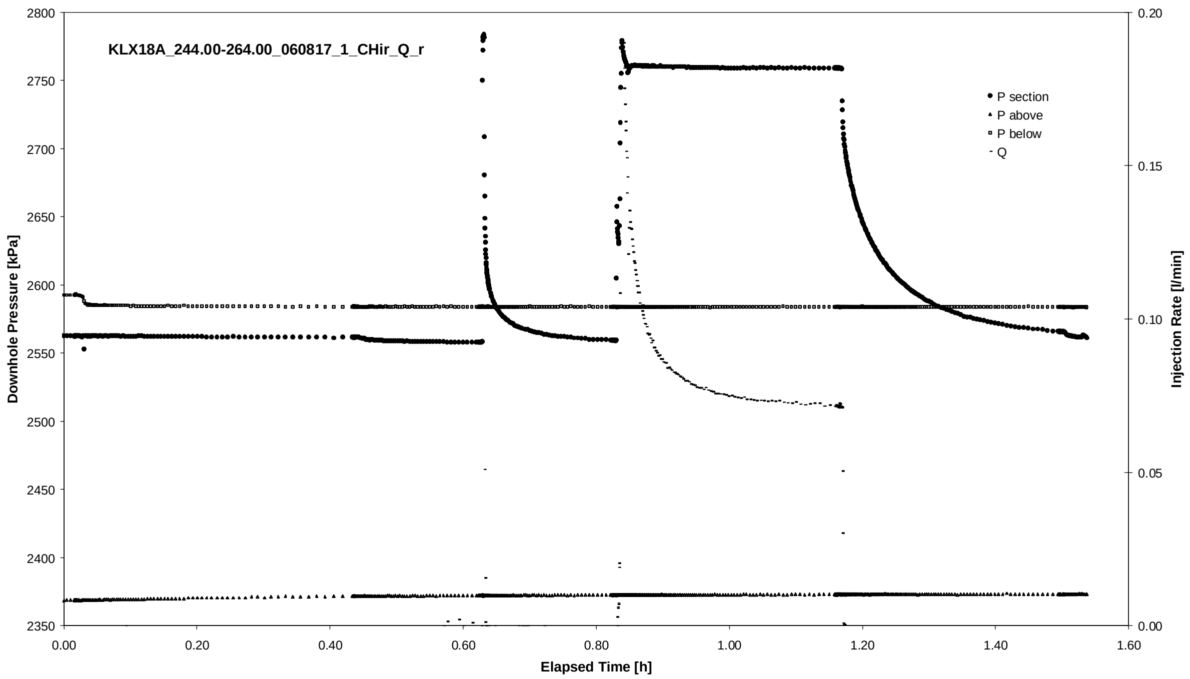


Pulse injection; deconvolution match

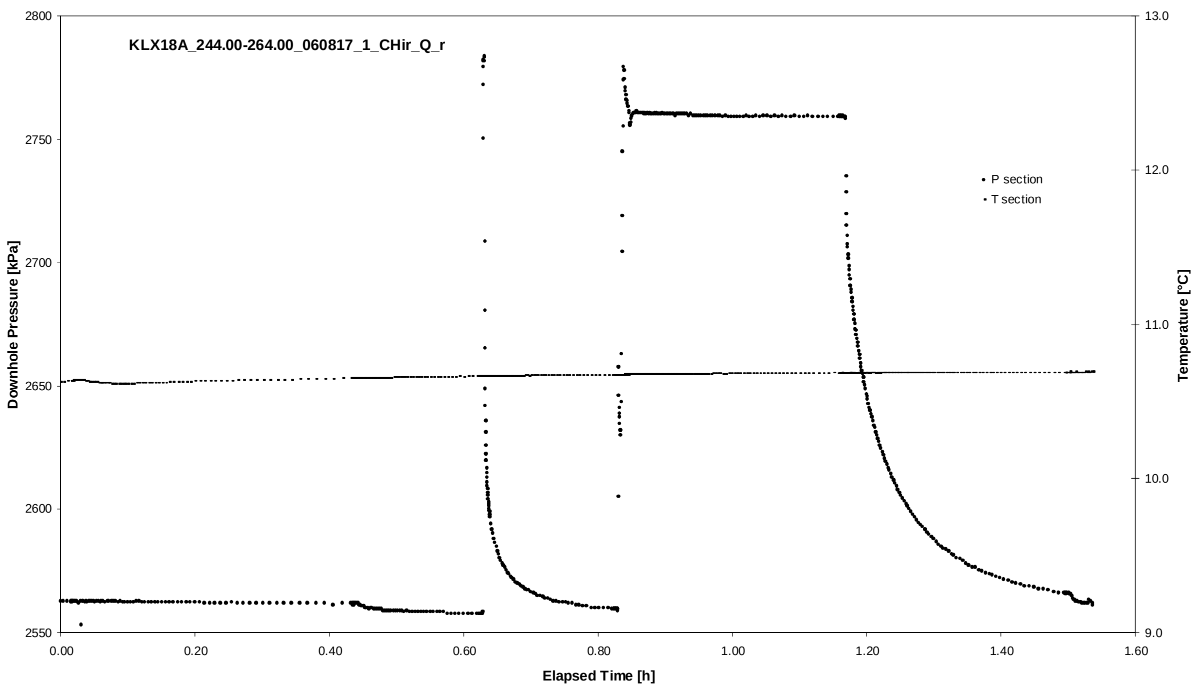
APPENDIX 2-13

Test 244.00 – 264.00 m

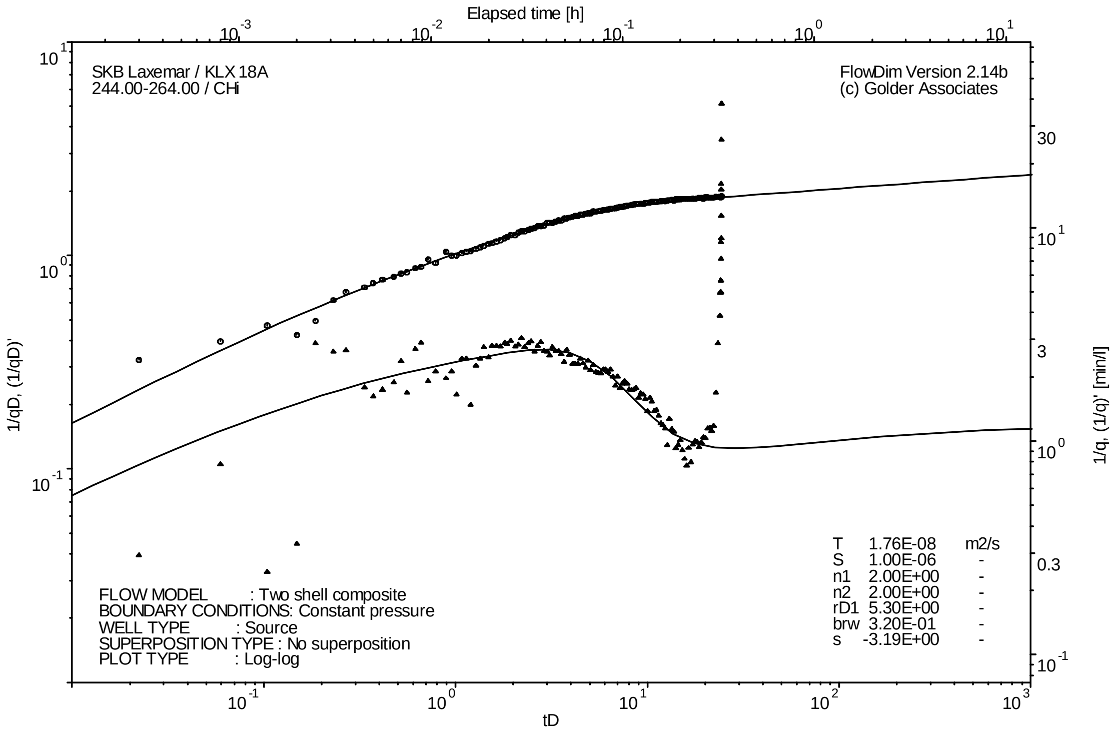
Analysis diagrams



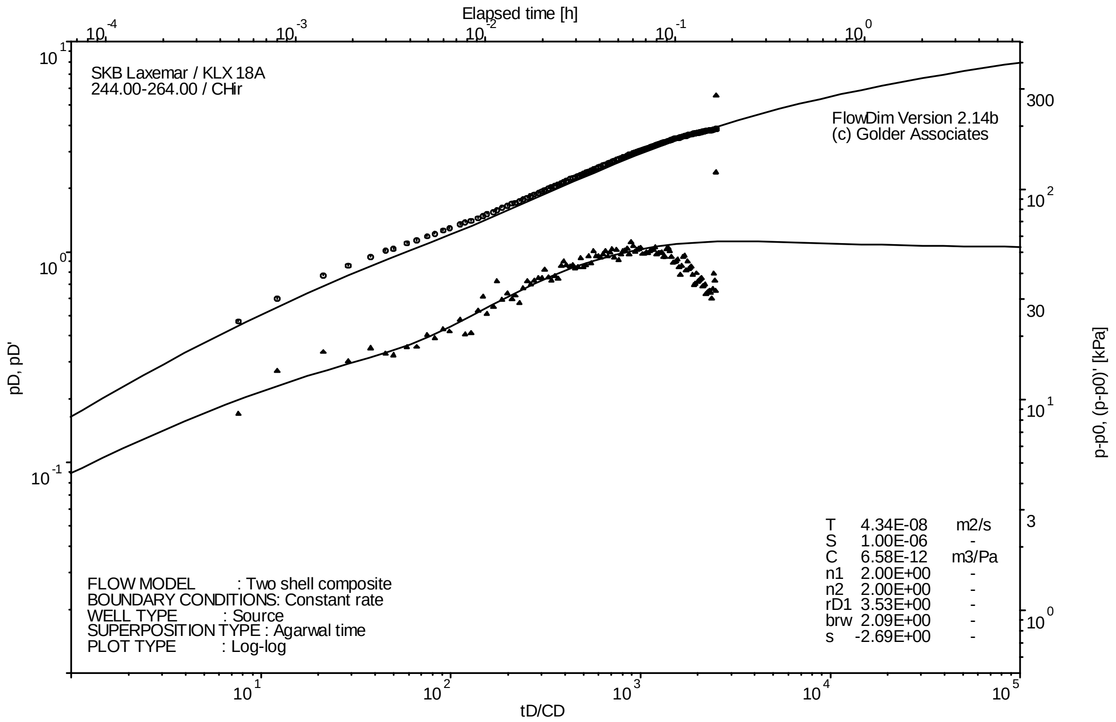
Pressure and flow rate vs. time; cartesian plot



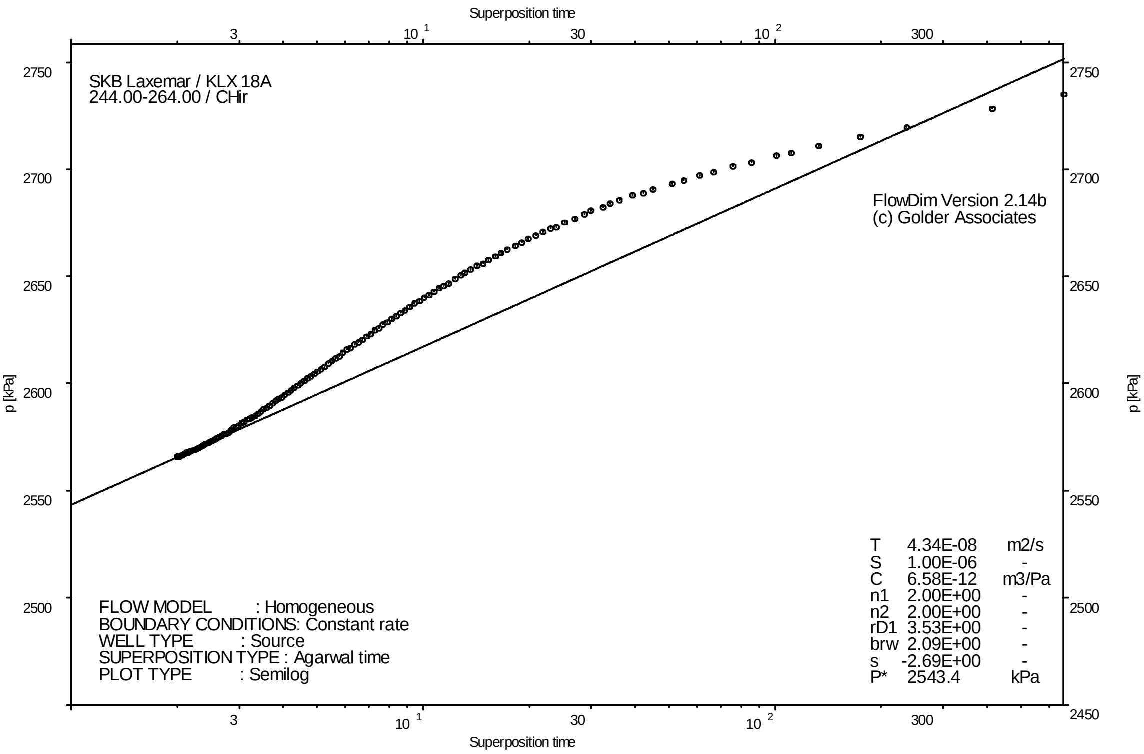
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

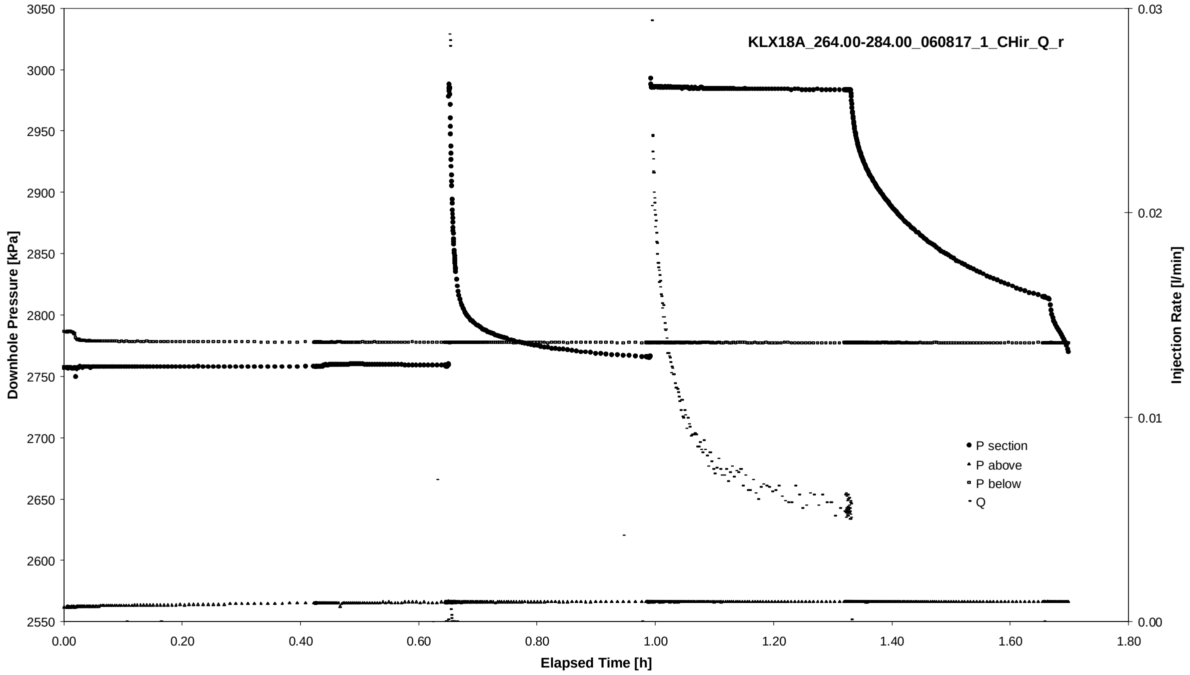


CHIR phase; HORNER match

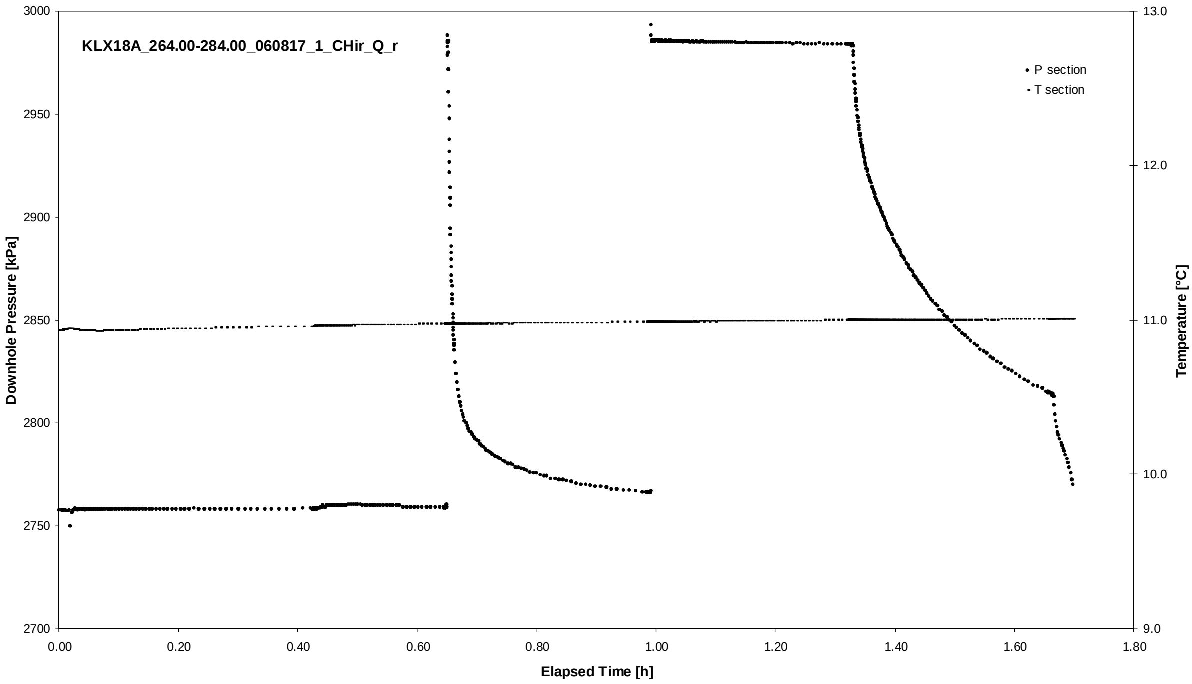
APPENDIX 2-14

Test 264.00 – 284.00 m

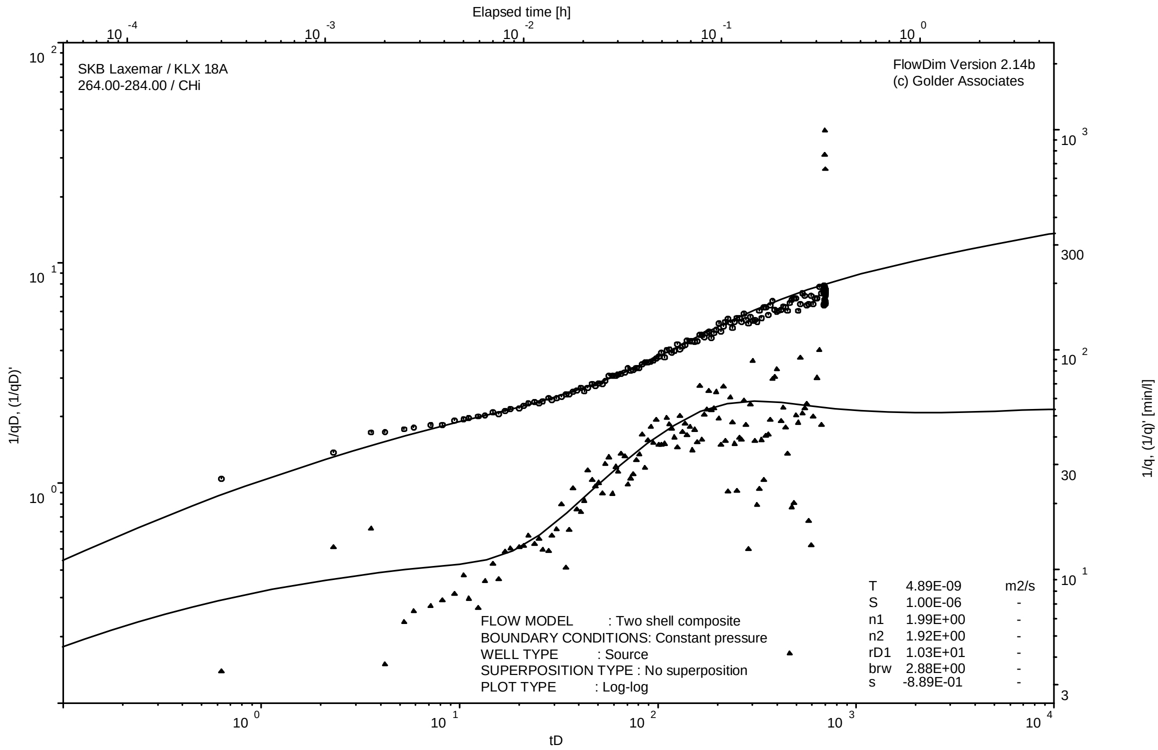
Analysis diagrams



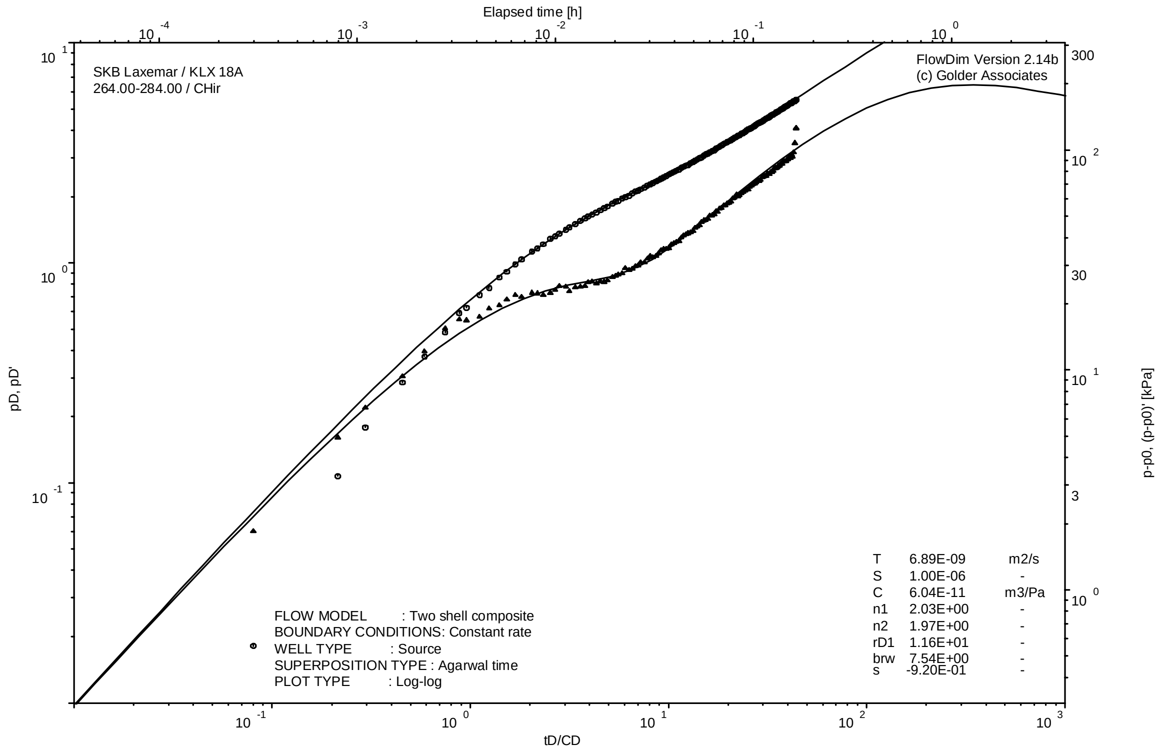
Pressure and flow rate vs. time; cartesian plot



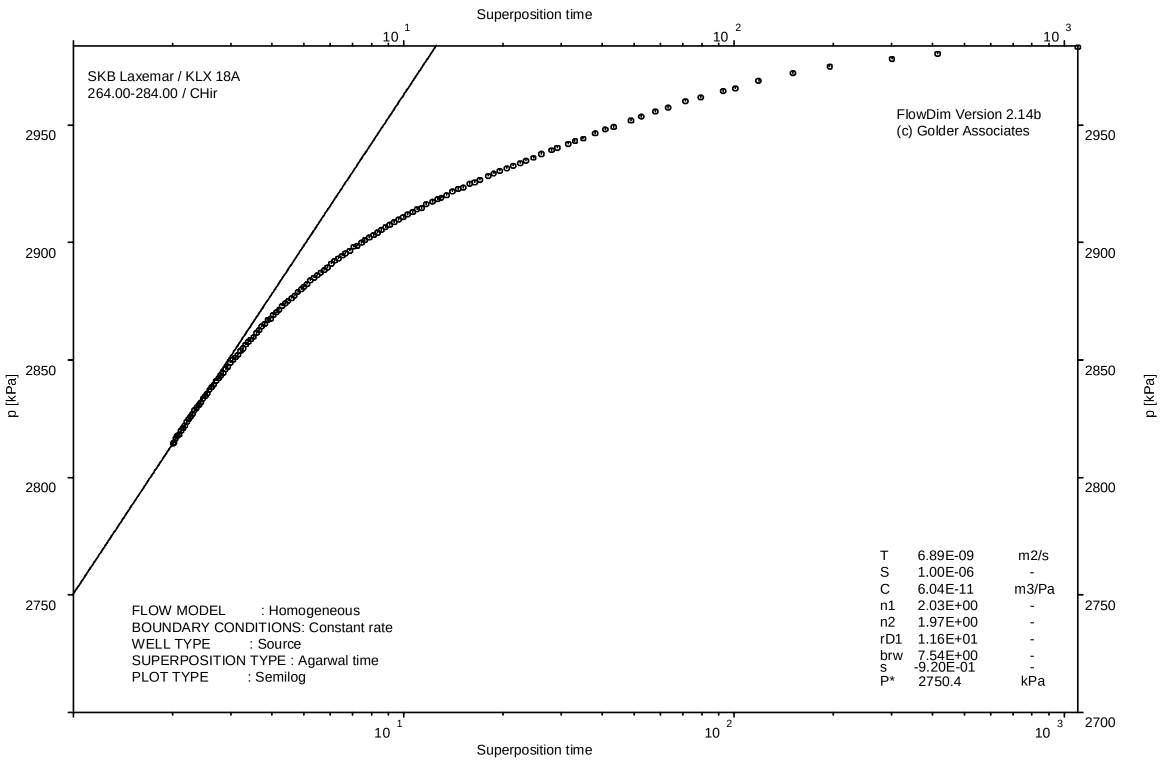
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

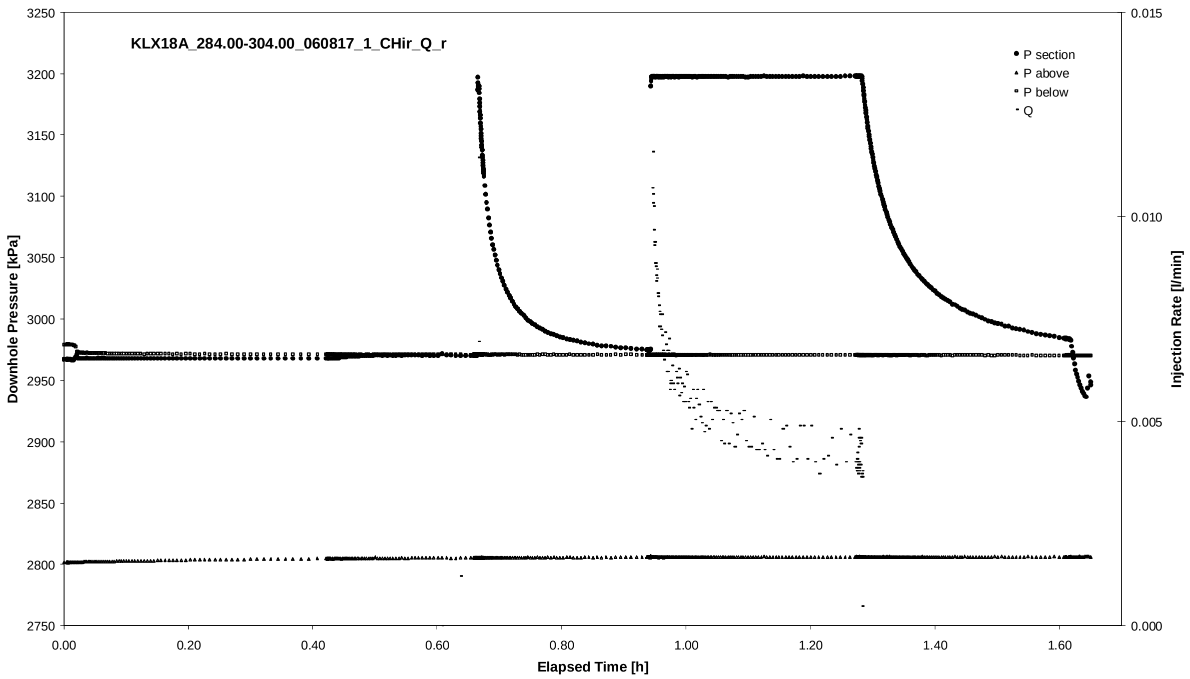


CHIR phase; HORNER match

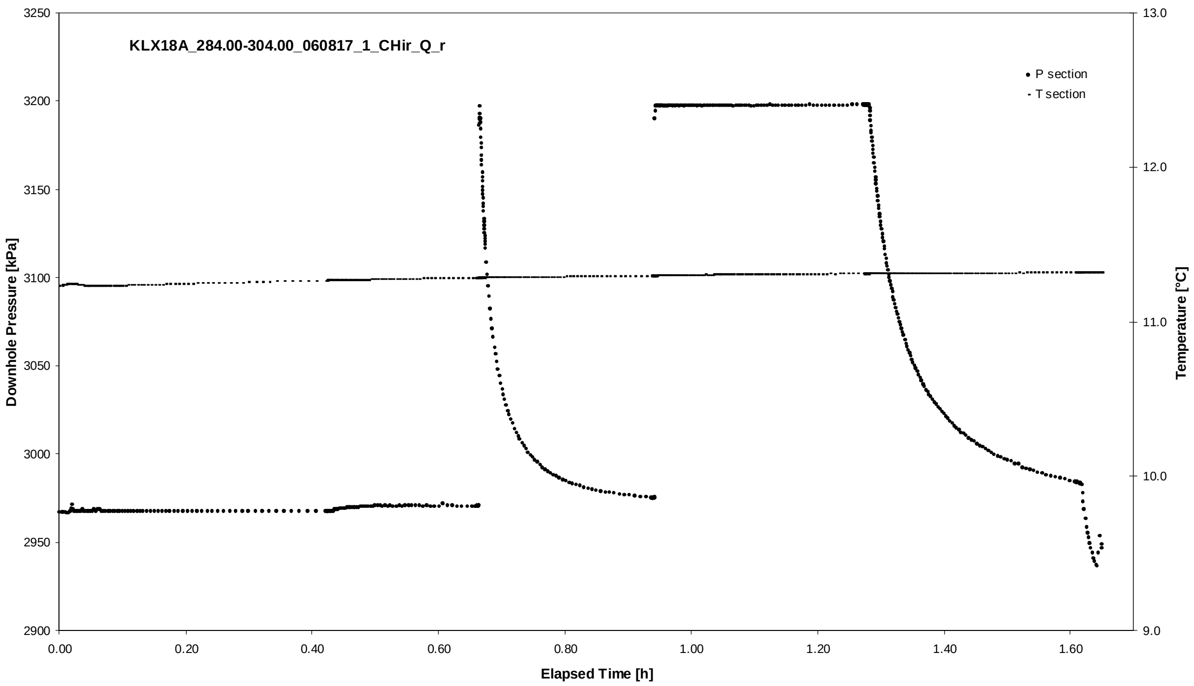
APPENDIX 2-15

Test 284.00 – 304.00 m

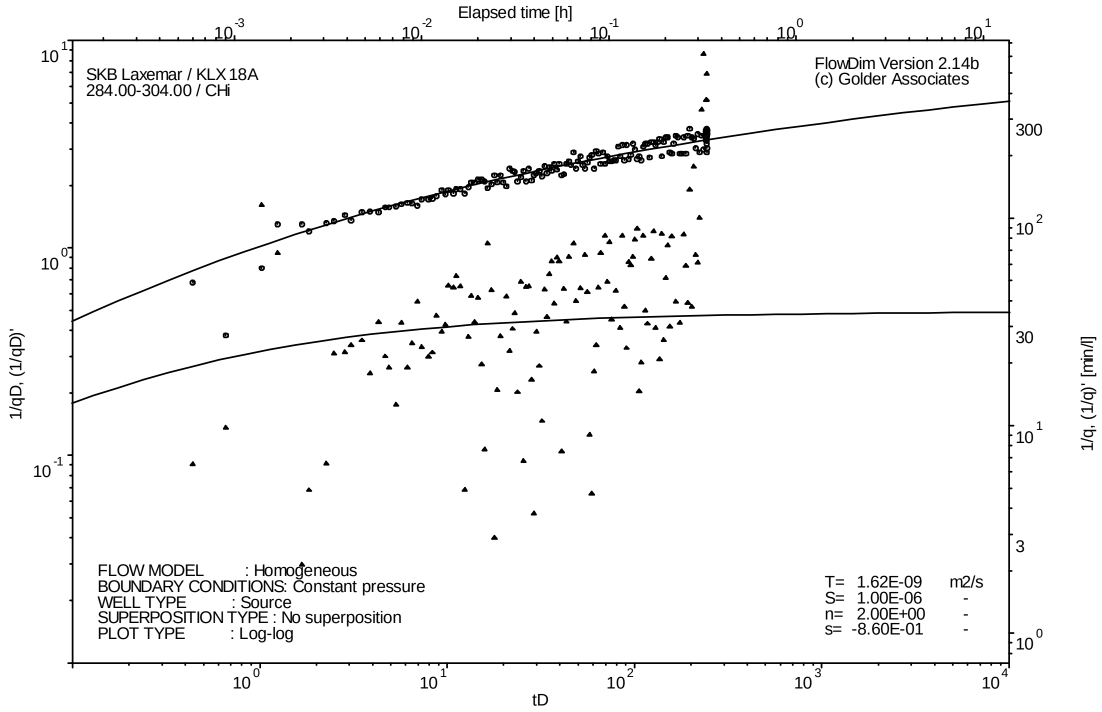
Analysis diagrams



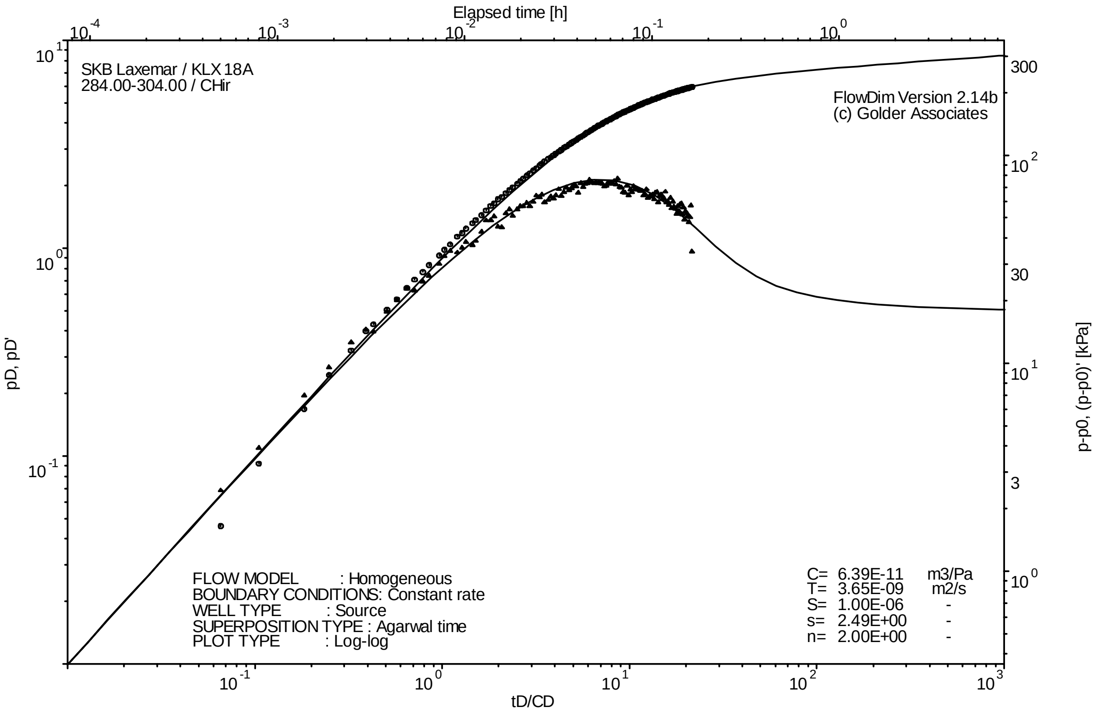
Pressure and flow rate vs. time; cartesian plot



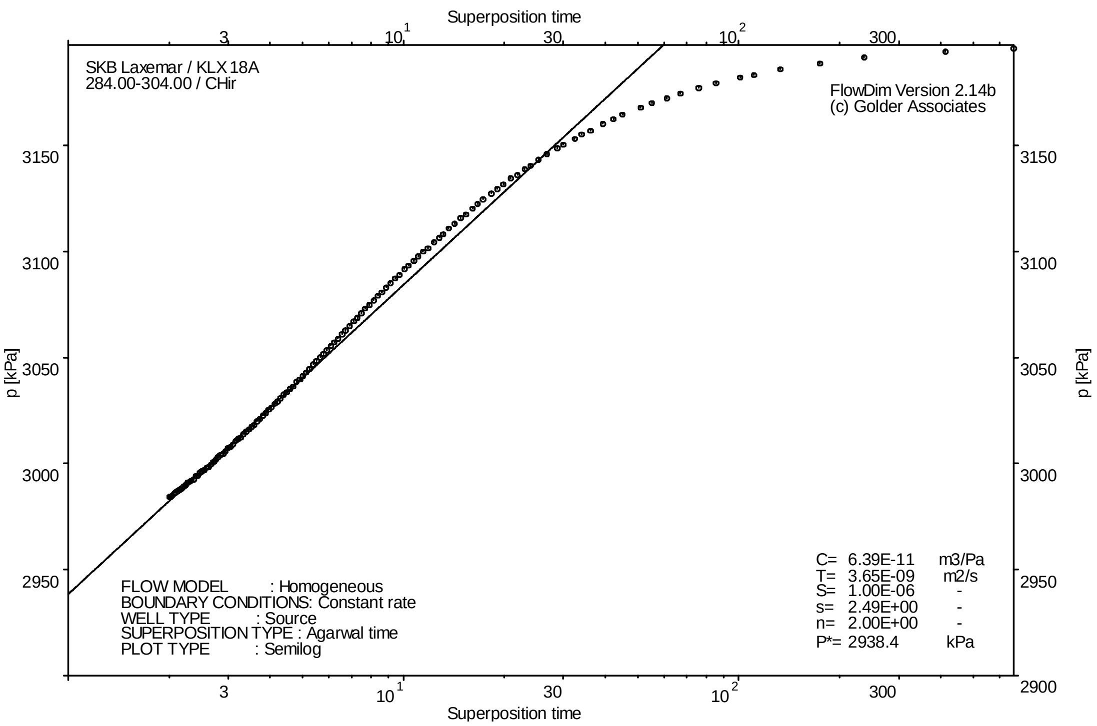
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

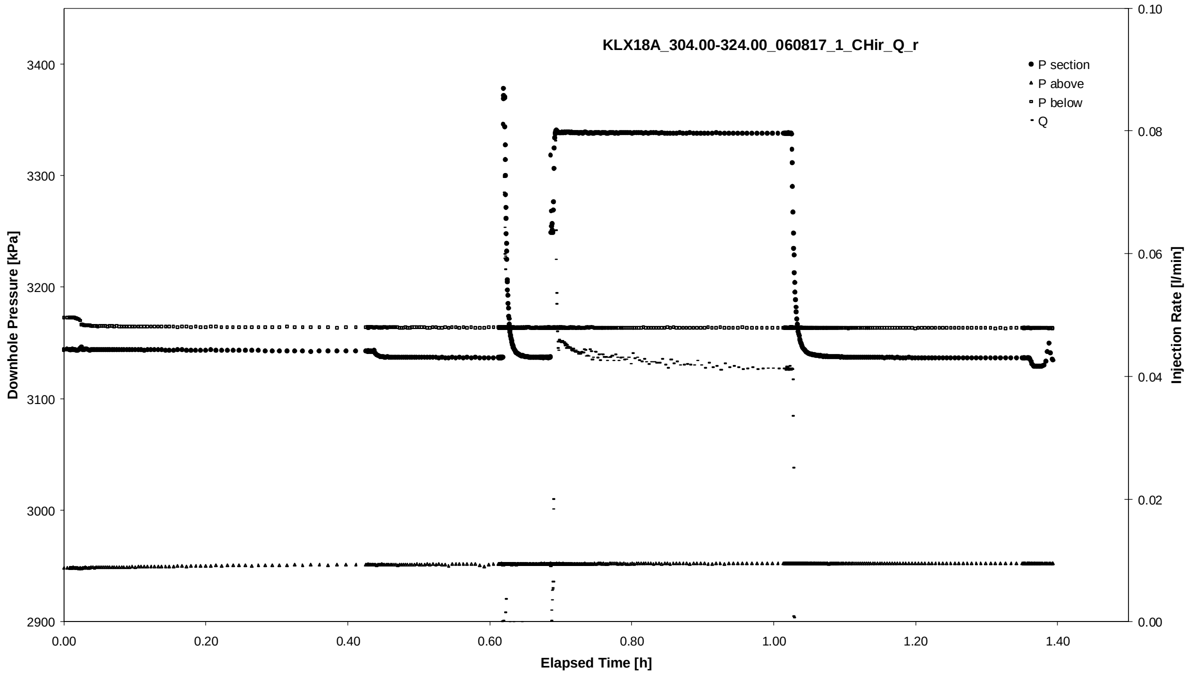


CHIR phase; HORNER match

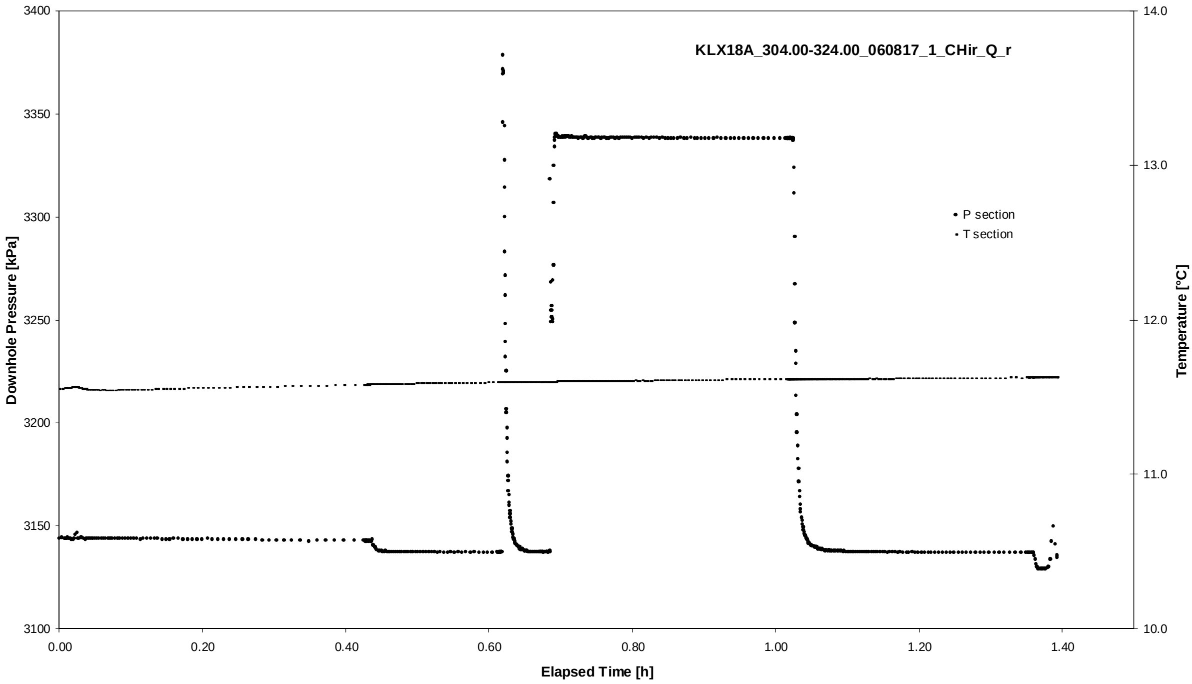
APPENDIX 2-16

Test 304.00 – 324.00 m

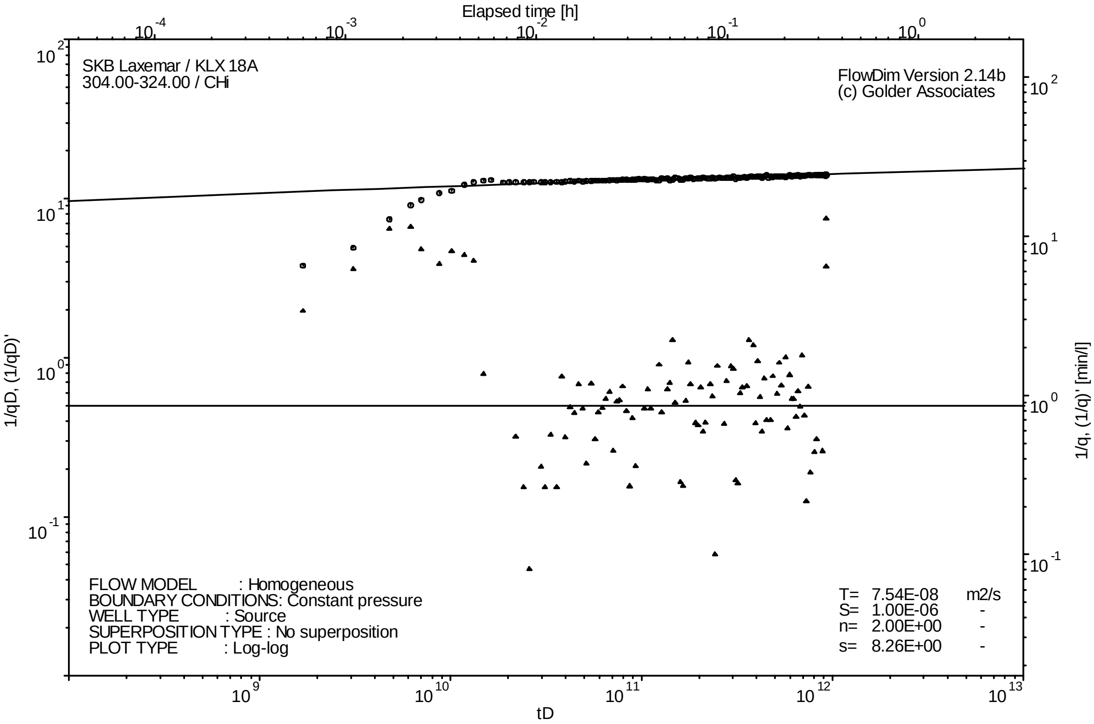
Analysis diagrams



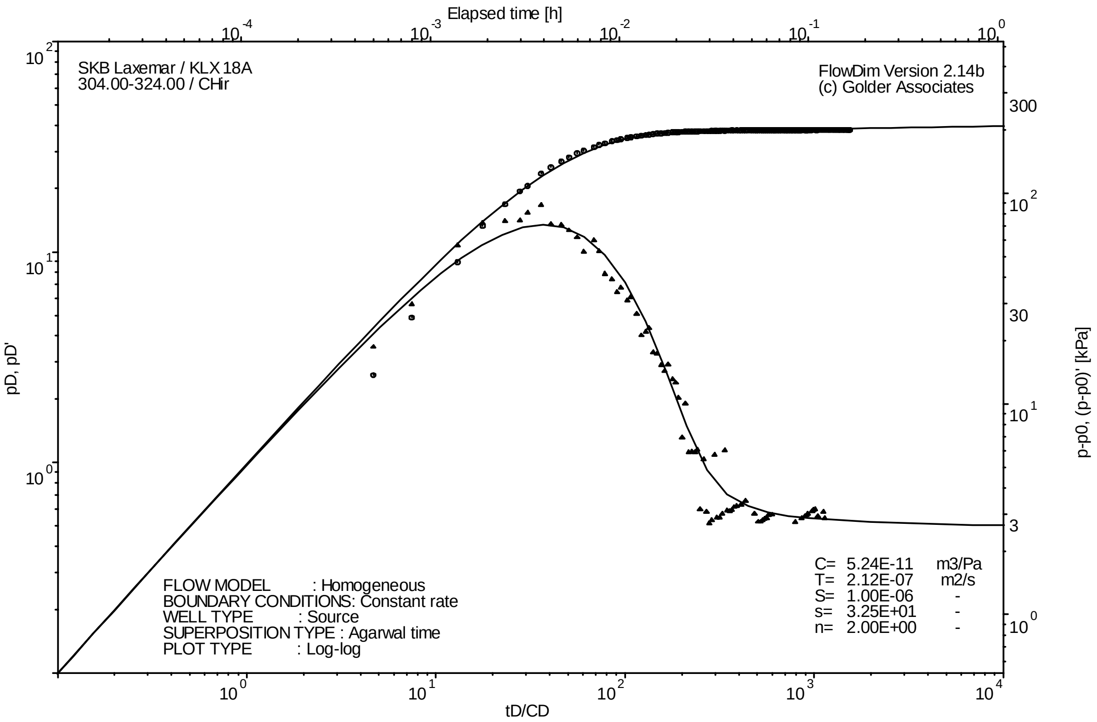
Pressure and flow rate vs. time; cartesian plot



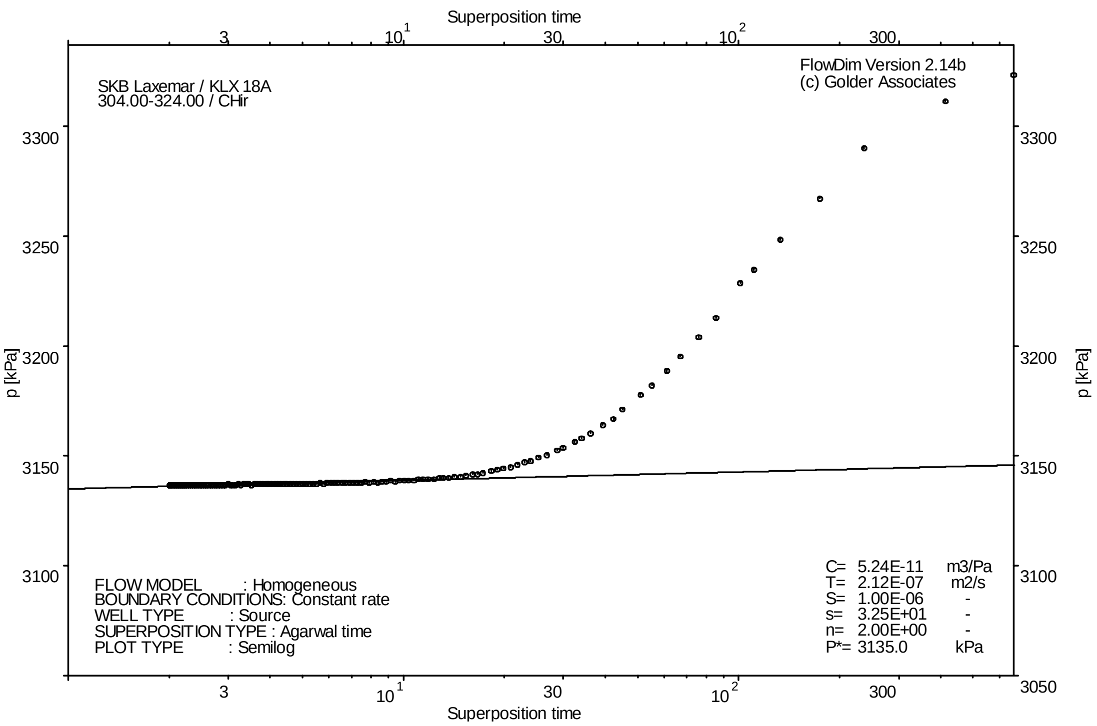
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

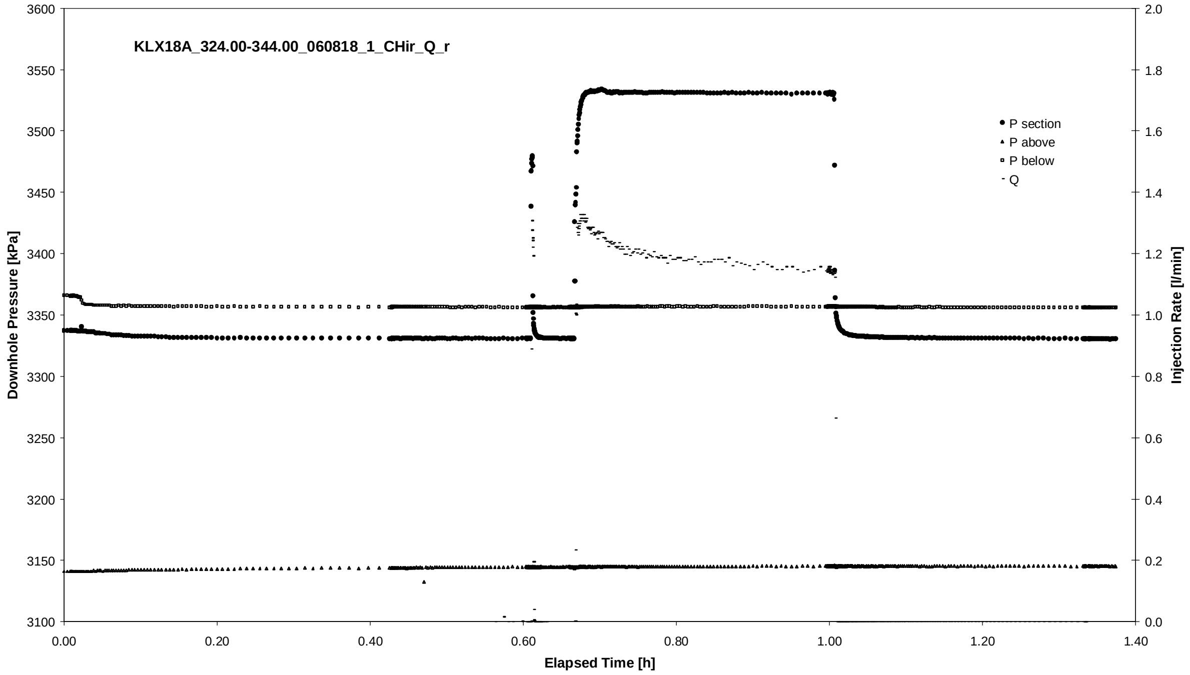


CHIR phase; HORNER match

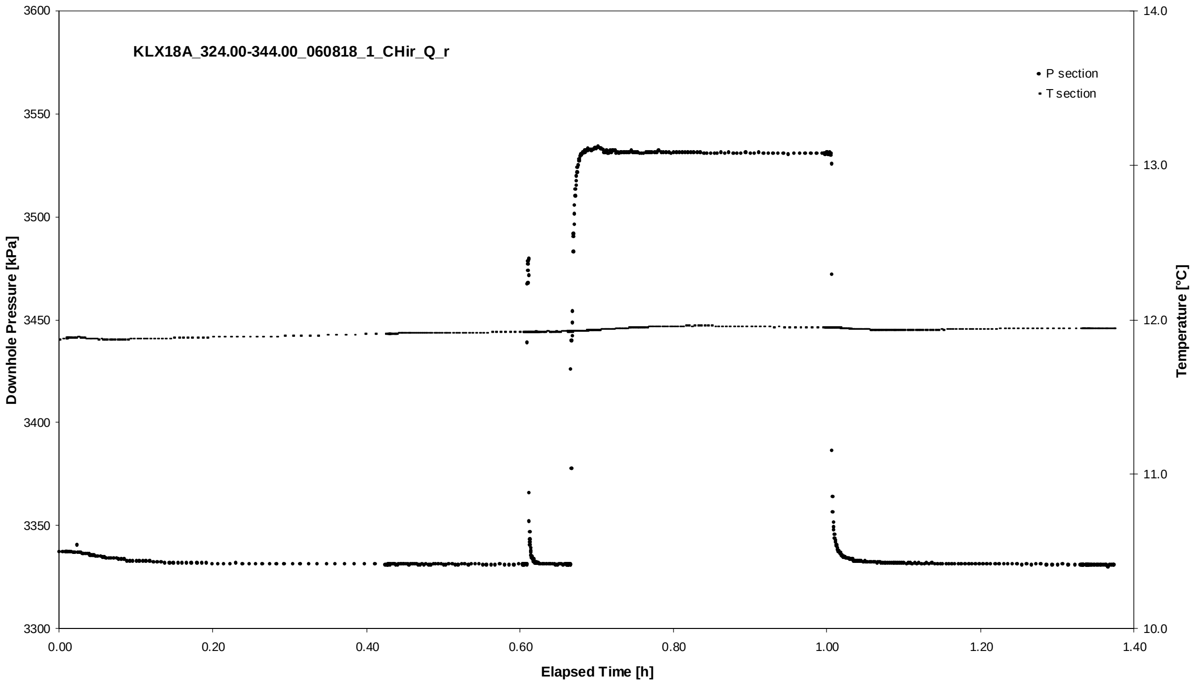
APPENDIX 2-17

Test 324.00 – 344.00 m

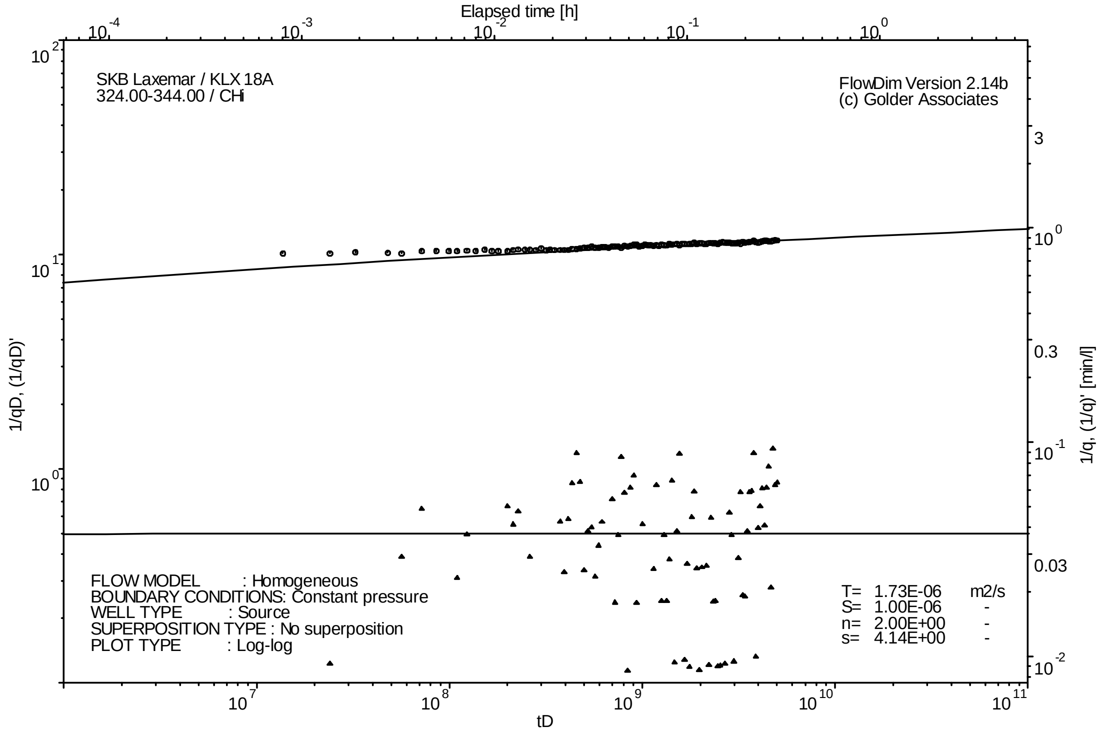
Analysis diagrams



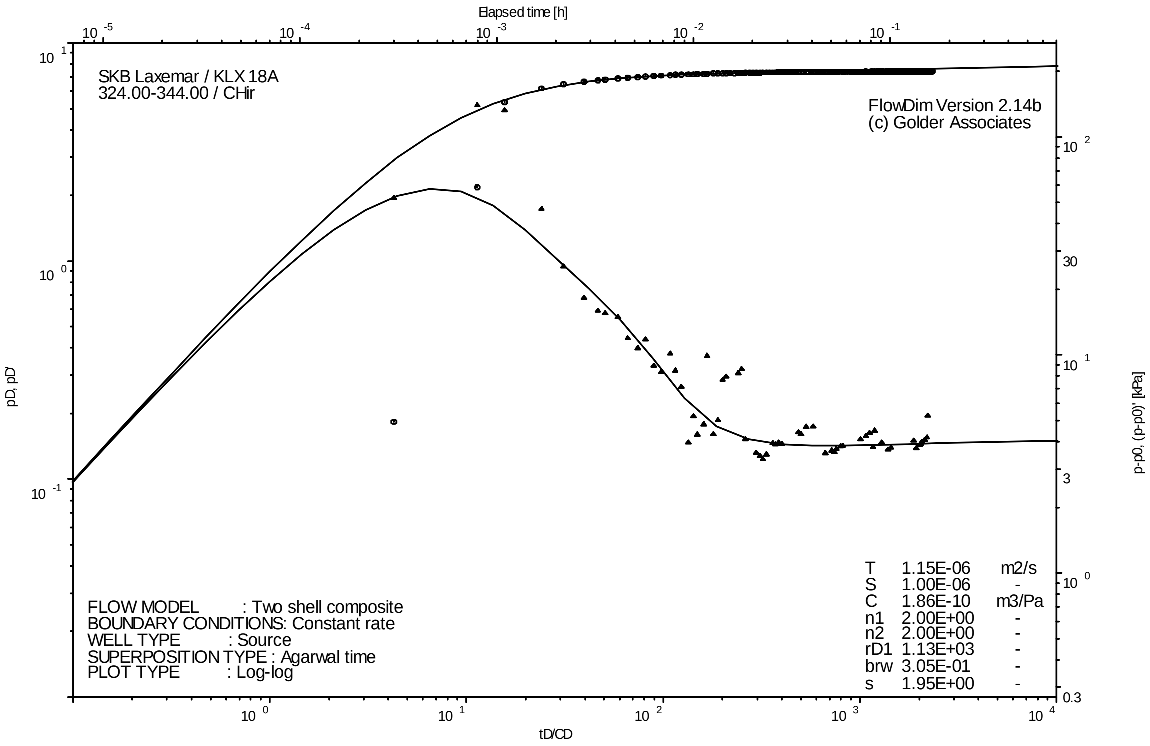
Pressure and flow rate vs. time; cartesian plot



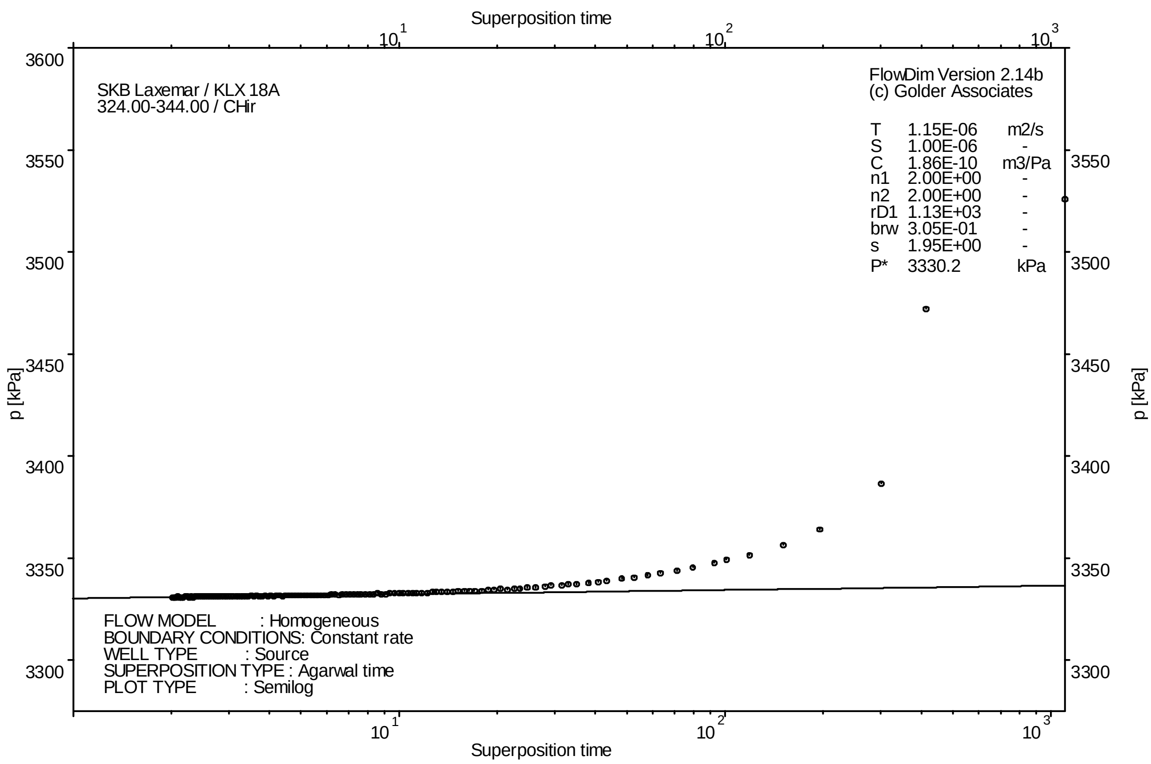
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

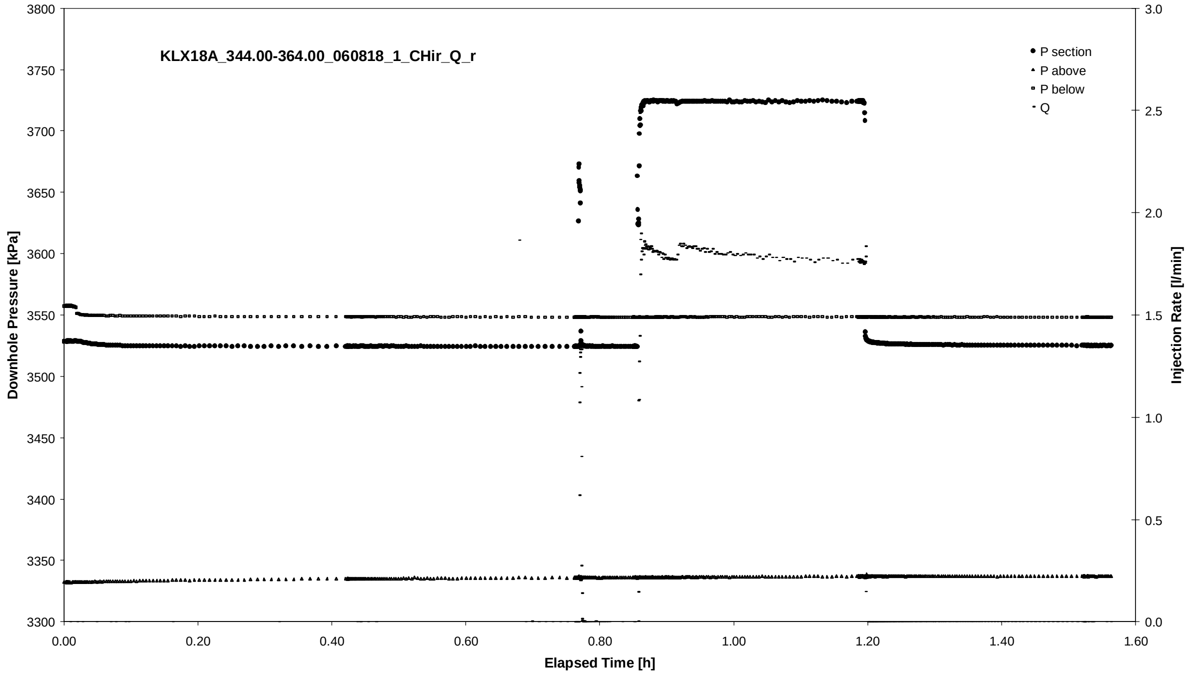


CHIR phase; HORNER match

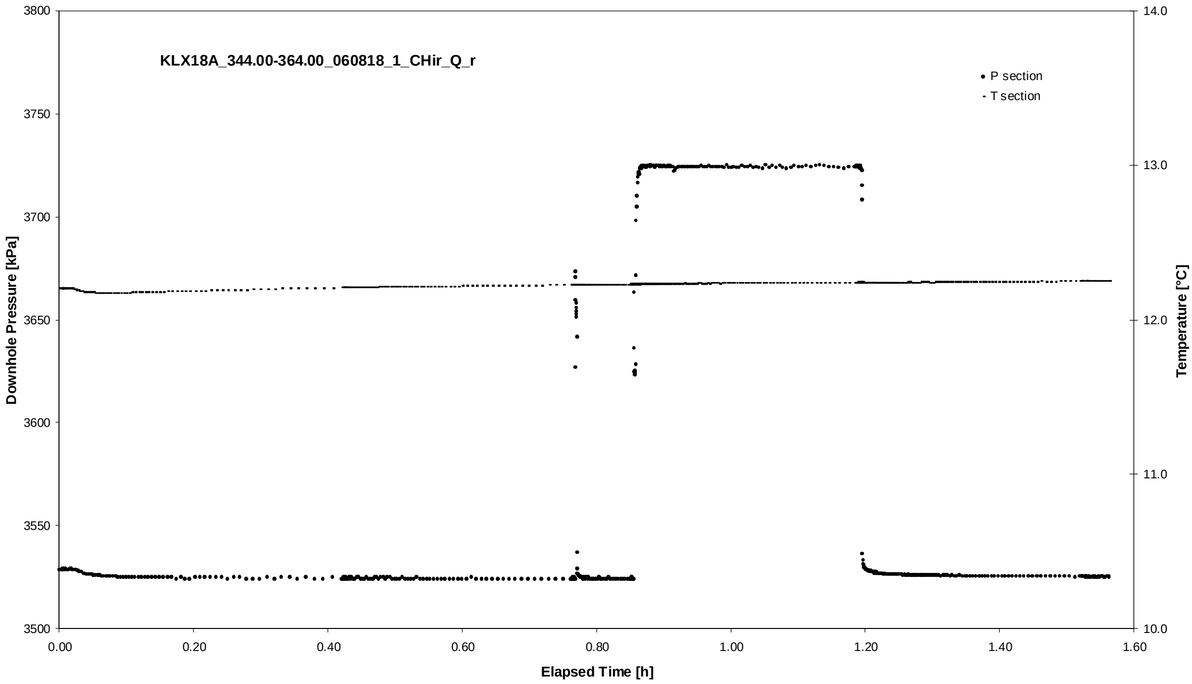
APPENDIX 2-18

Test 344.00 – 364.00 m

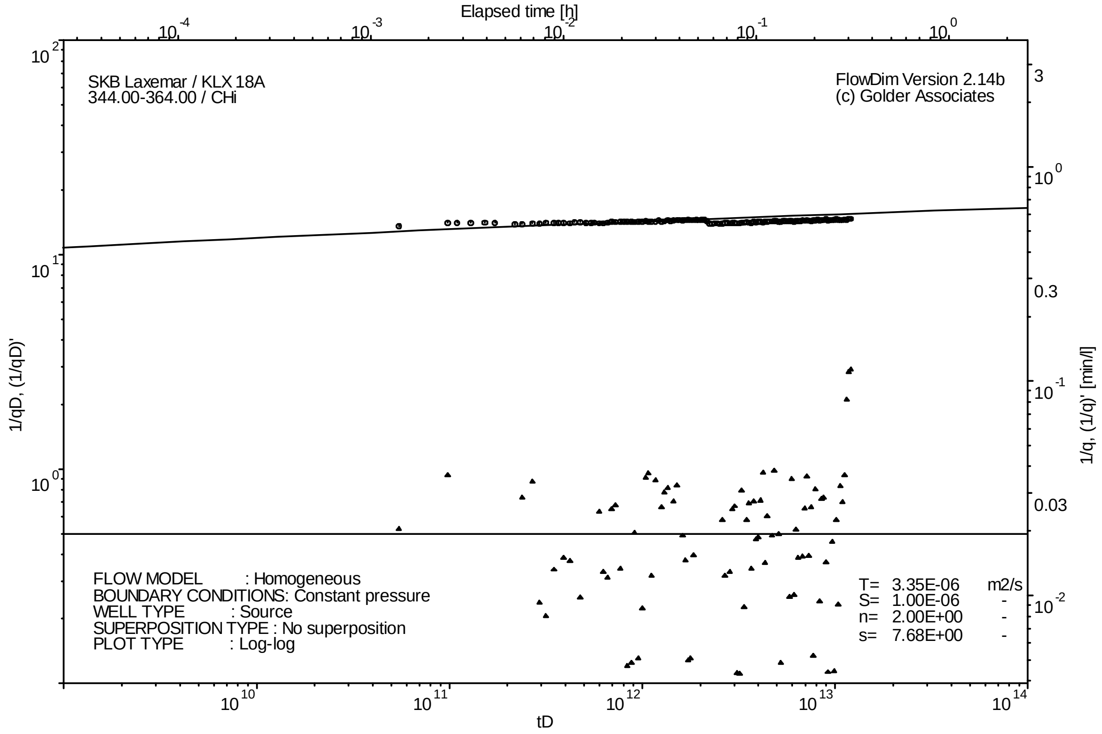
Analysis diagrams



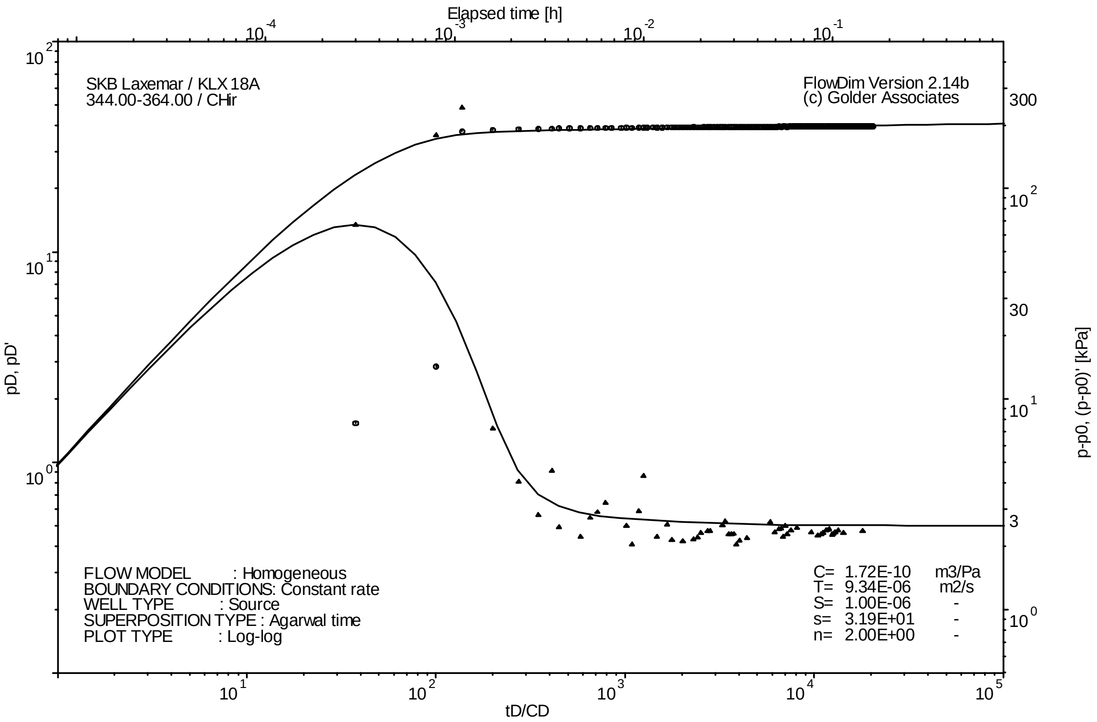
Pressure and flow rate vs. time; cartesian plot



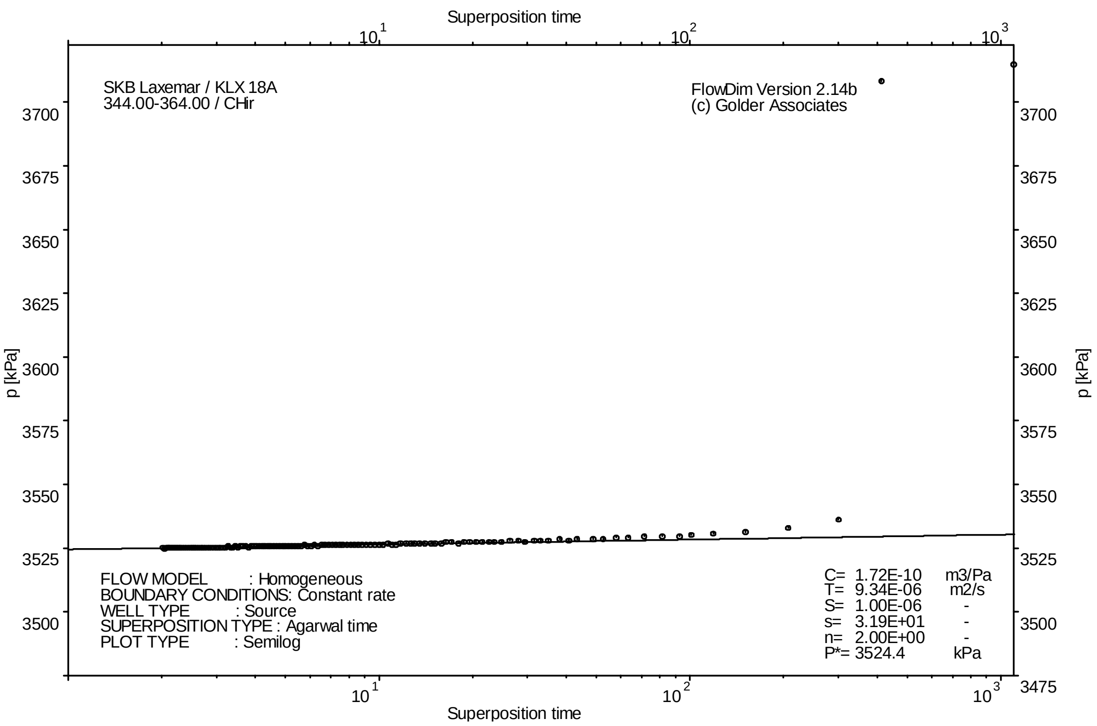
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

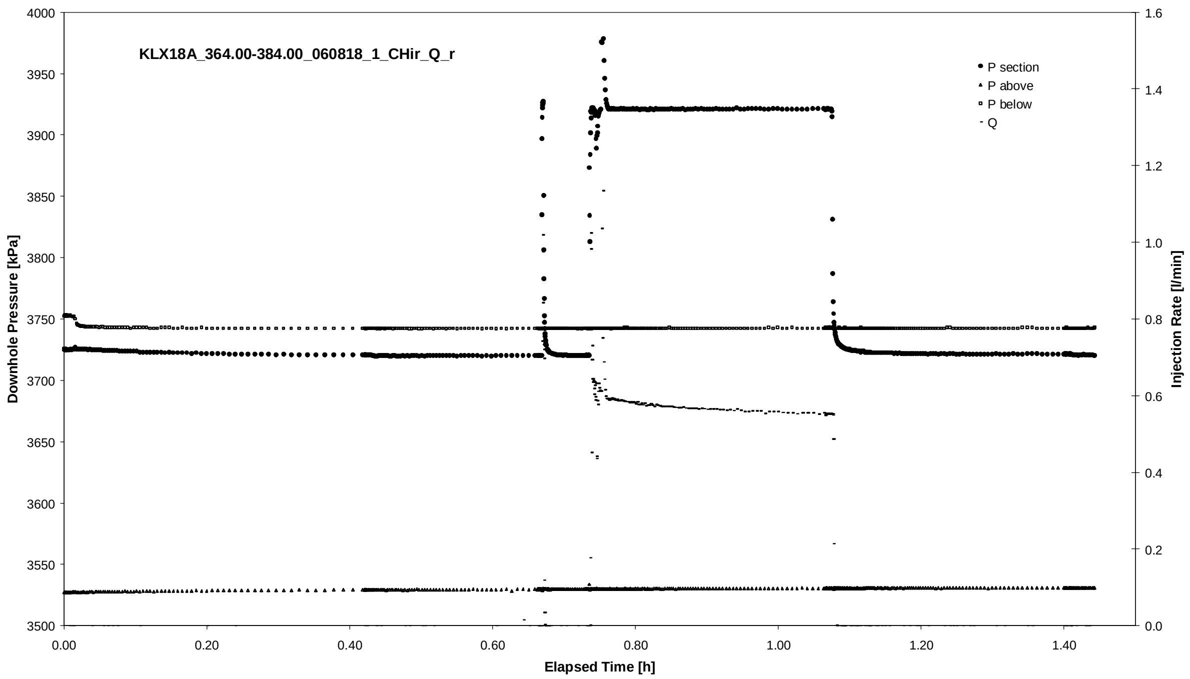


CHIR phase; HORNER match

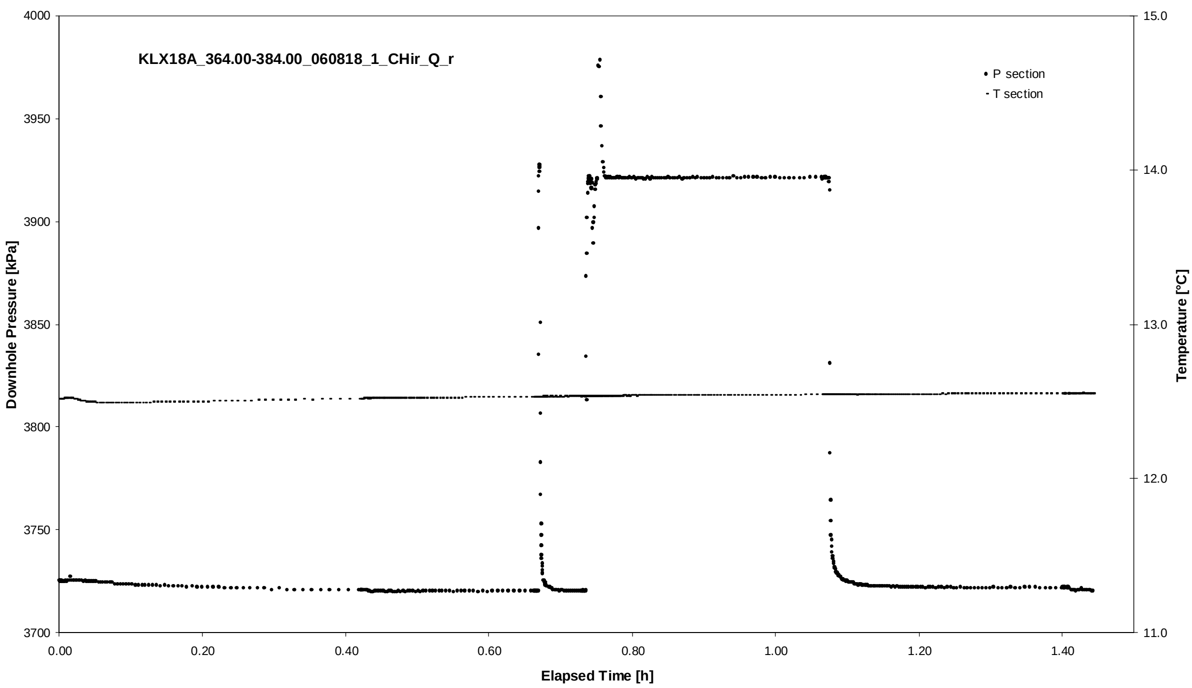
APPENDIX 2-19

Test 364.00 – 384.00 m

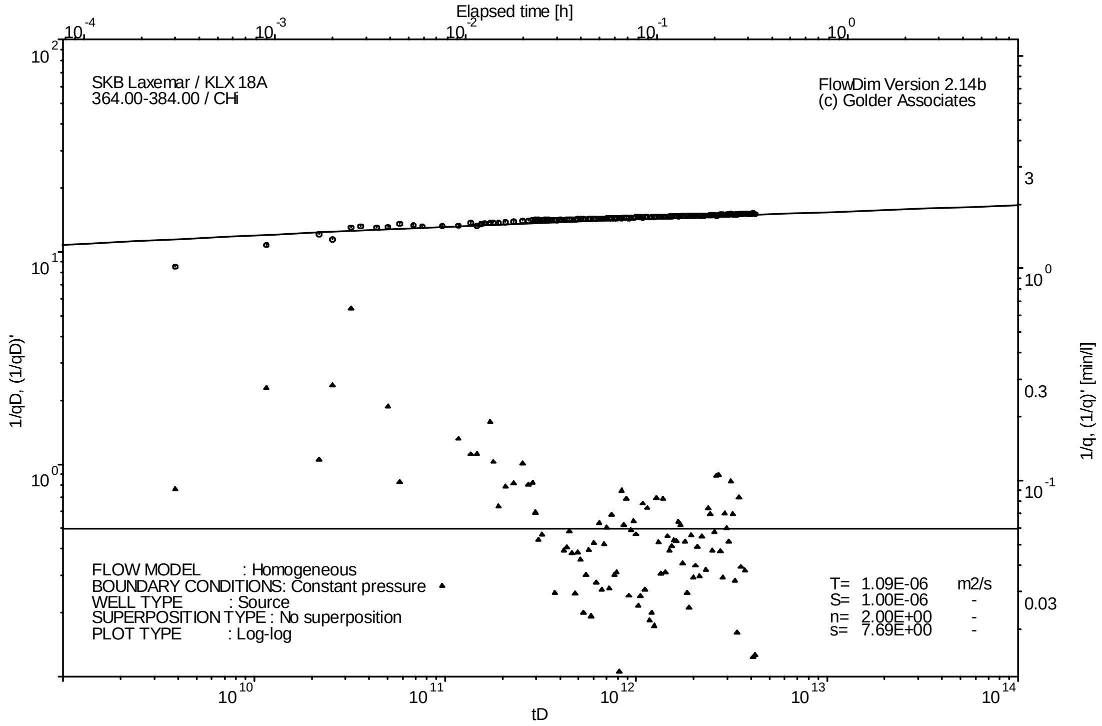
Analysis diagrams



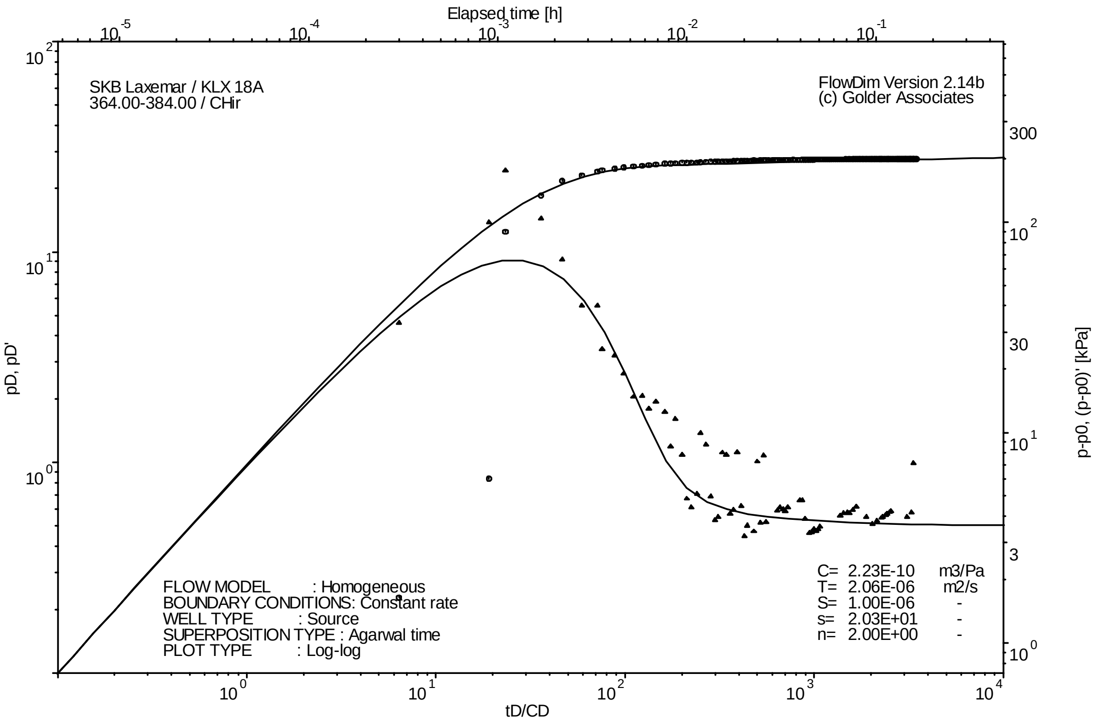
Pressure and flow rate vs. time; cartesian plot



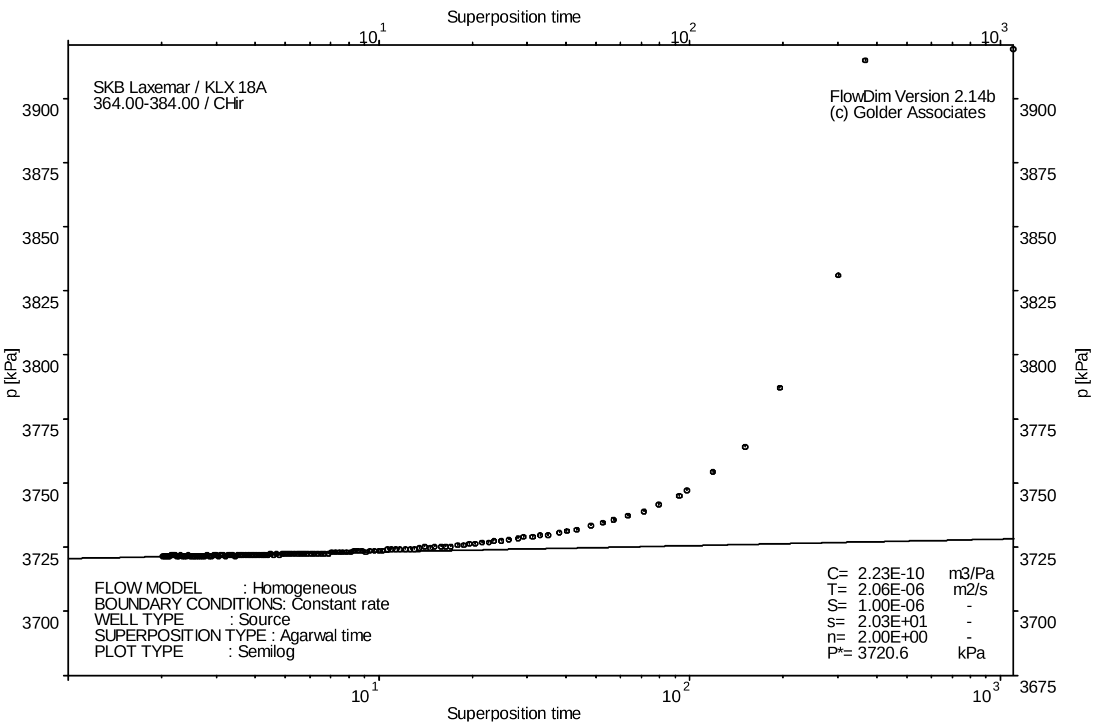
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

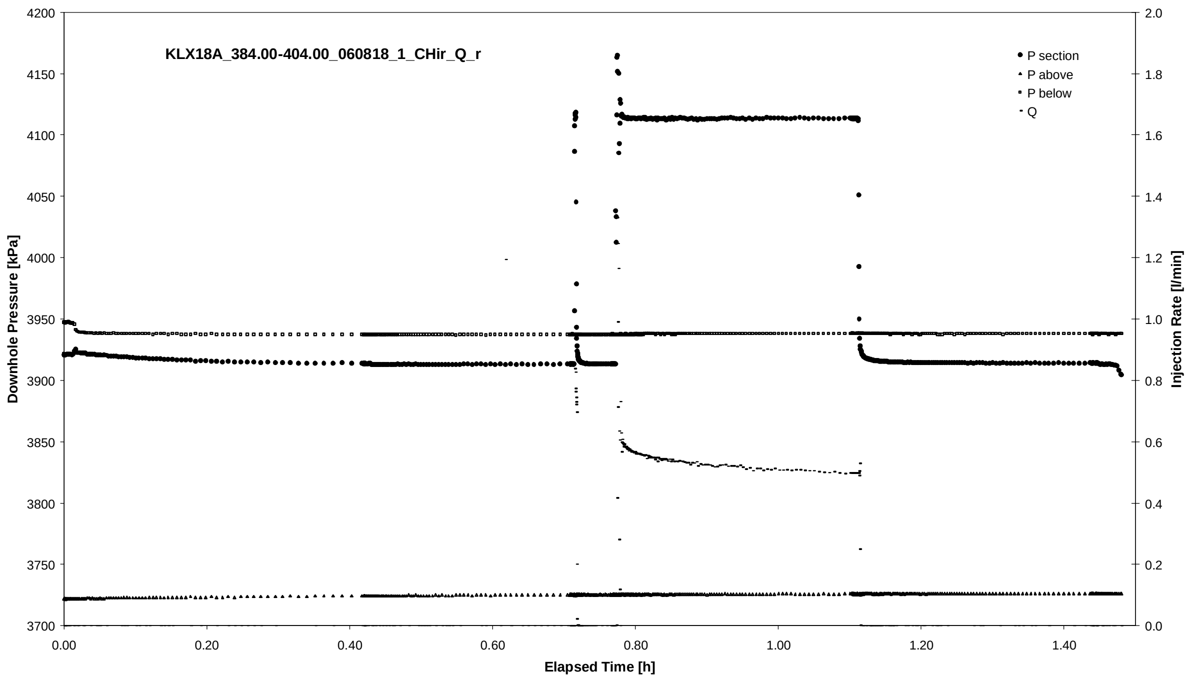


CHIR phase; HORNER match

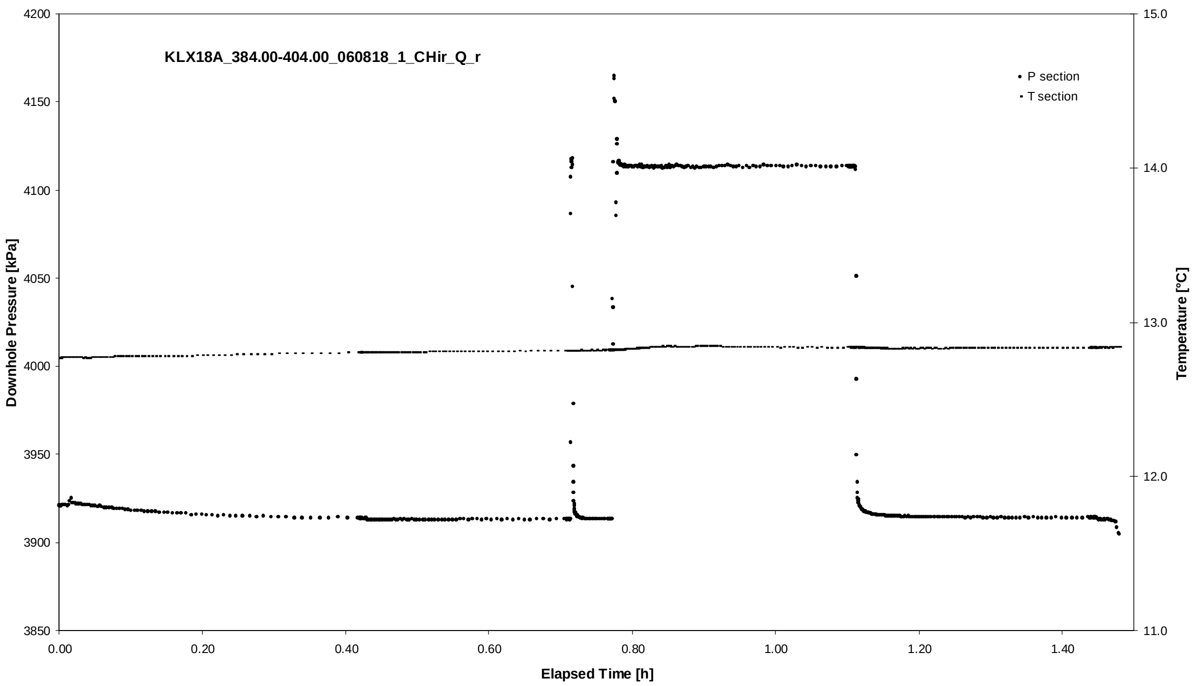
APPENDIX 2-20

Test 384.00 – 404.00 m

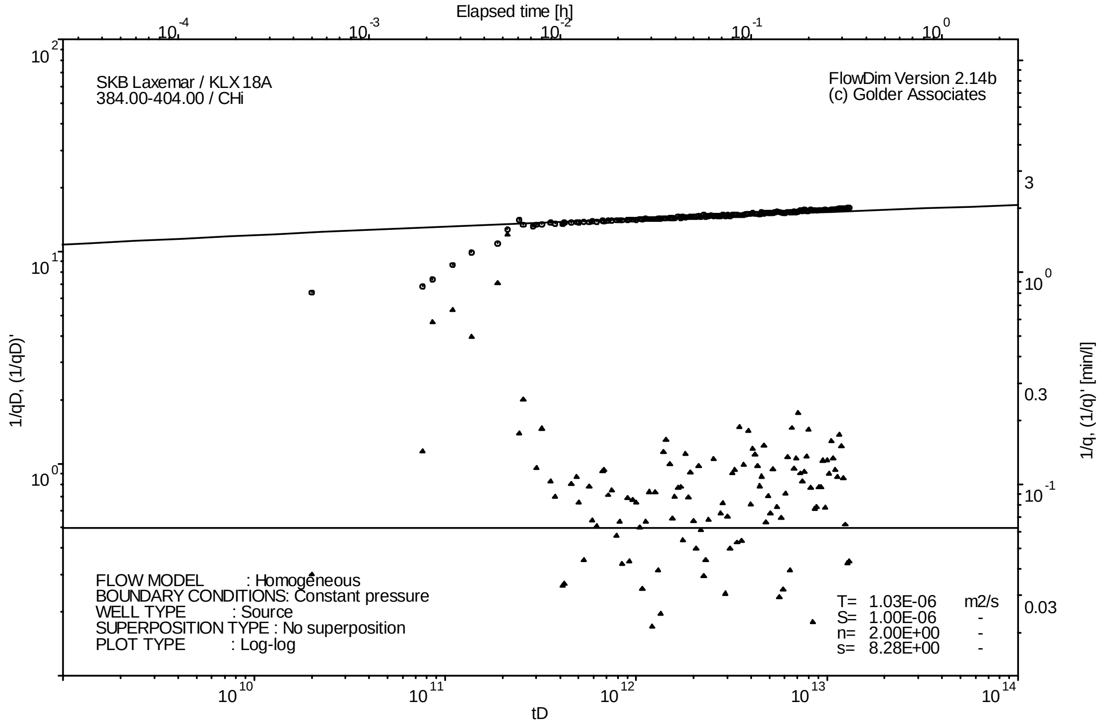
Analysis diagrams



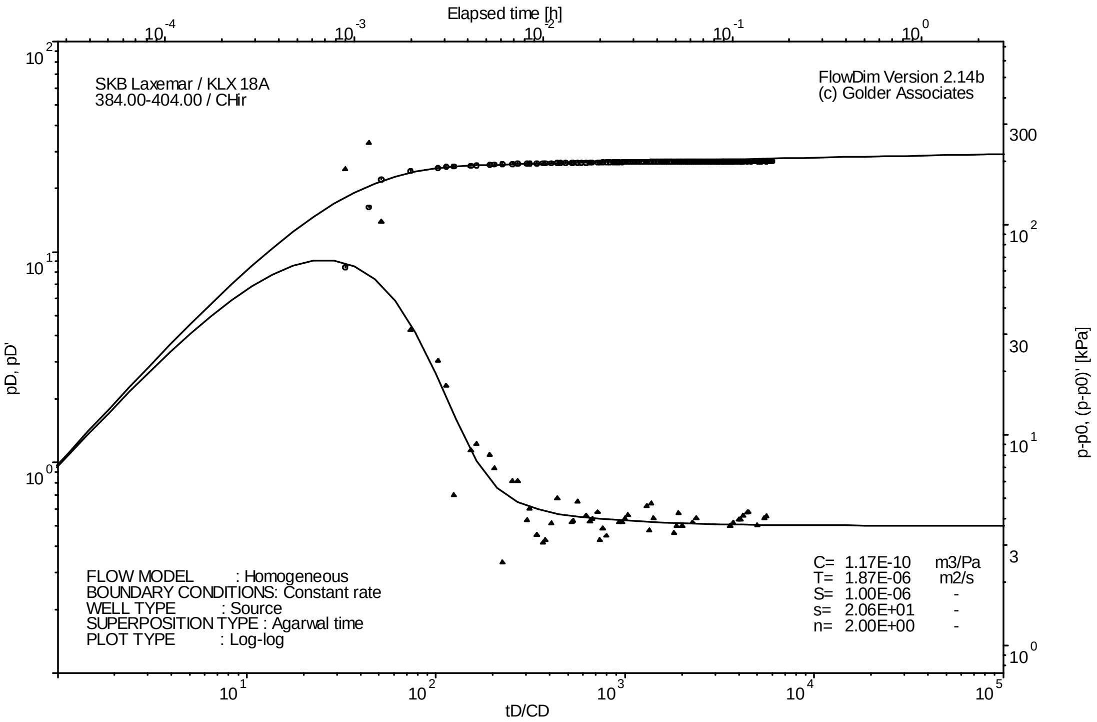
Pressure and flow rate vs. time; cartesian plot



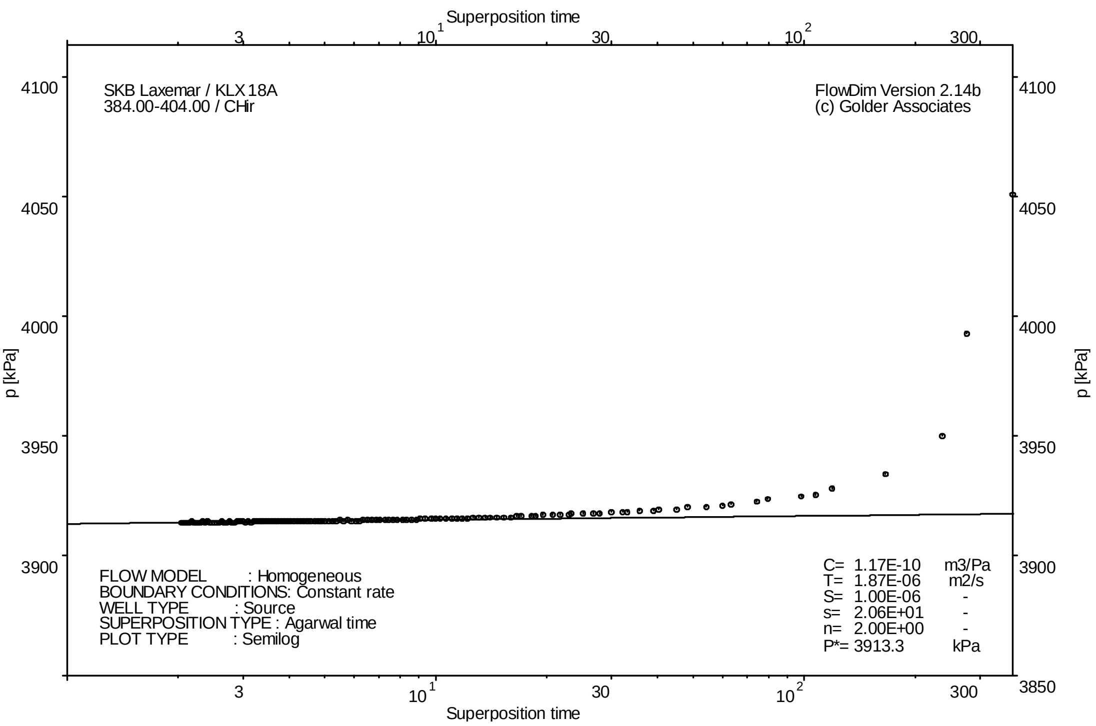
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

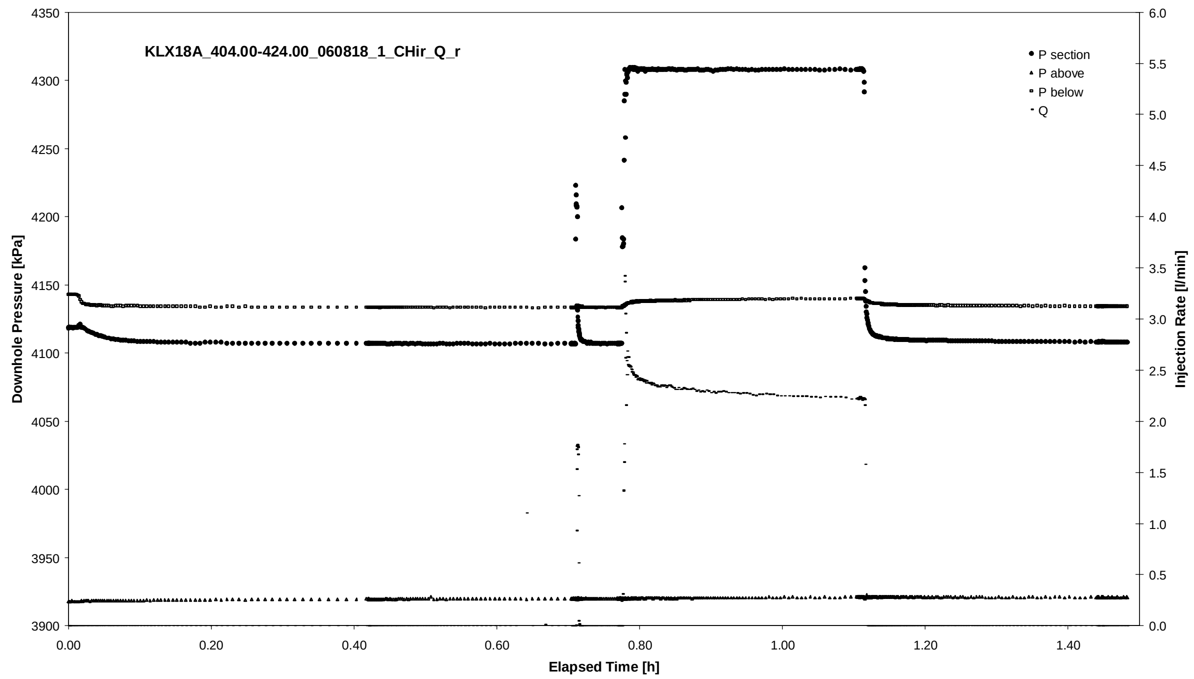


CHIR phase; HORNER match

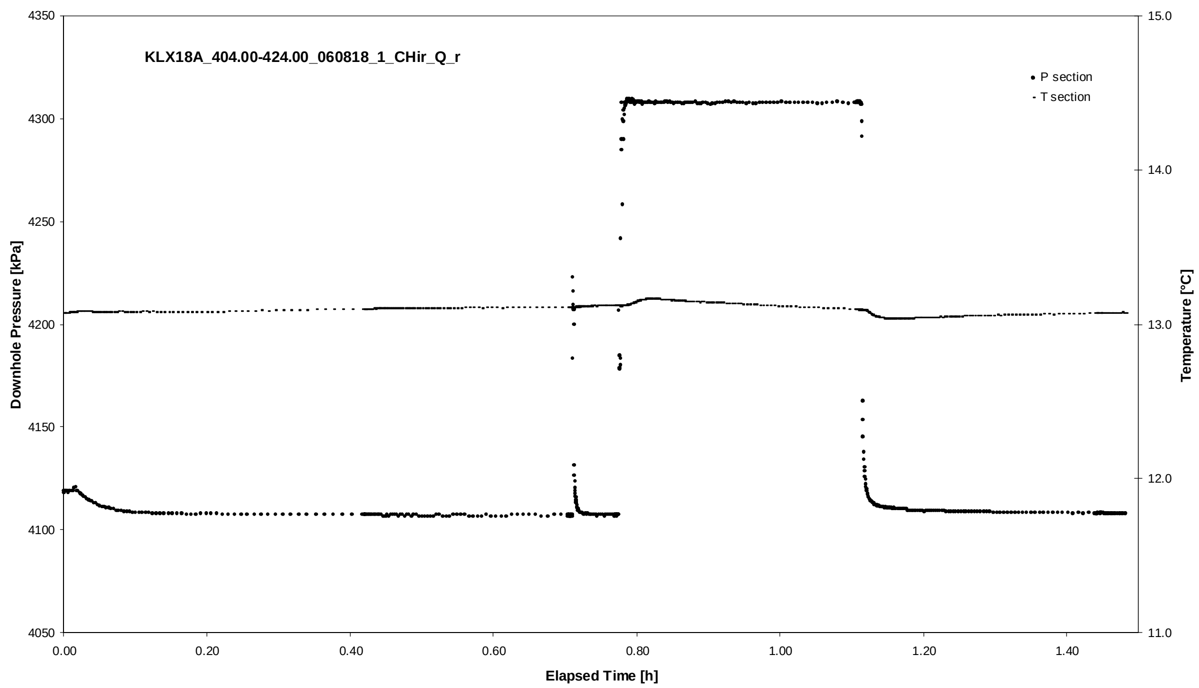
APPENDIX 2-21

Test 404.00 – 424.00 m

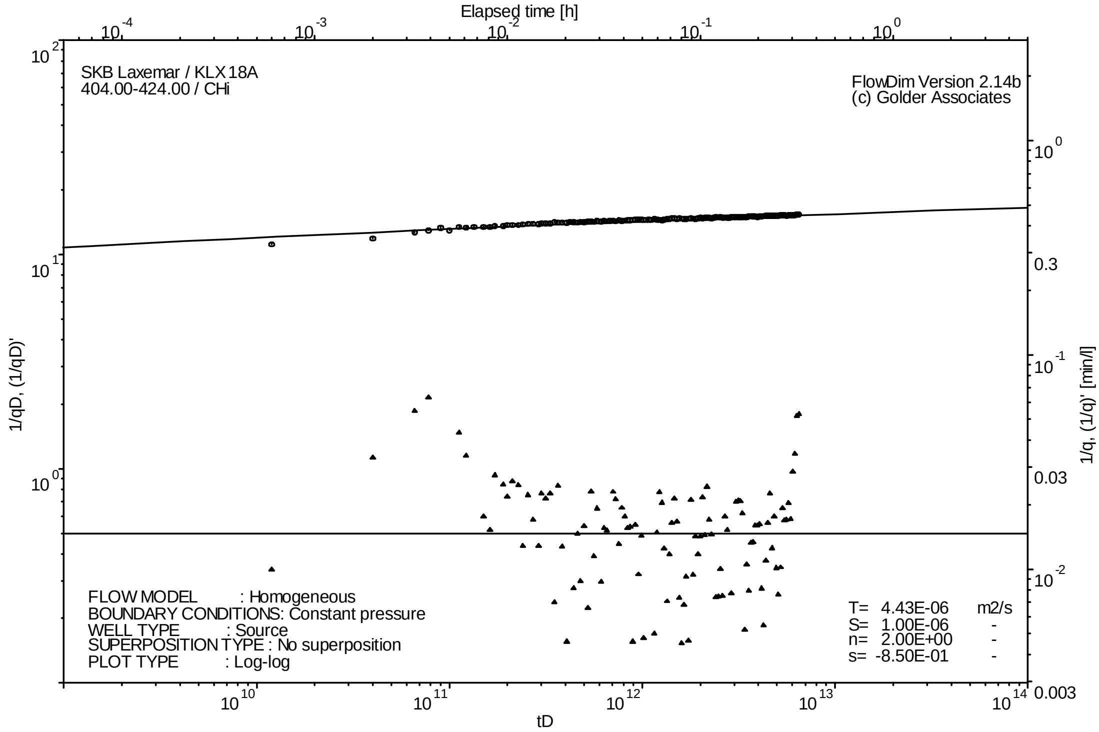
Analysis diagrams



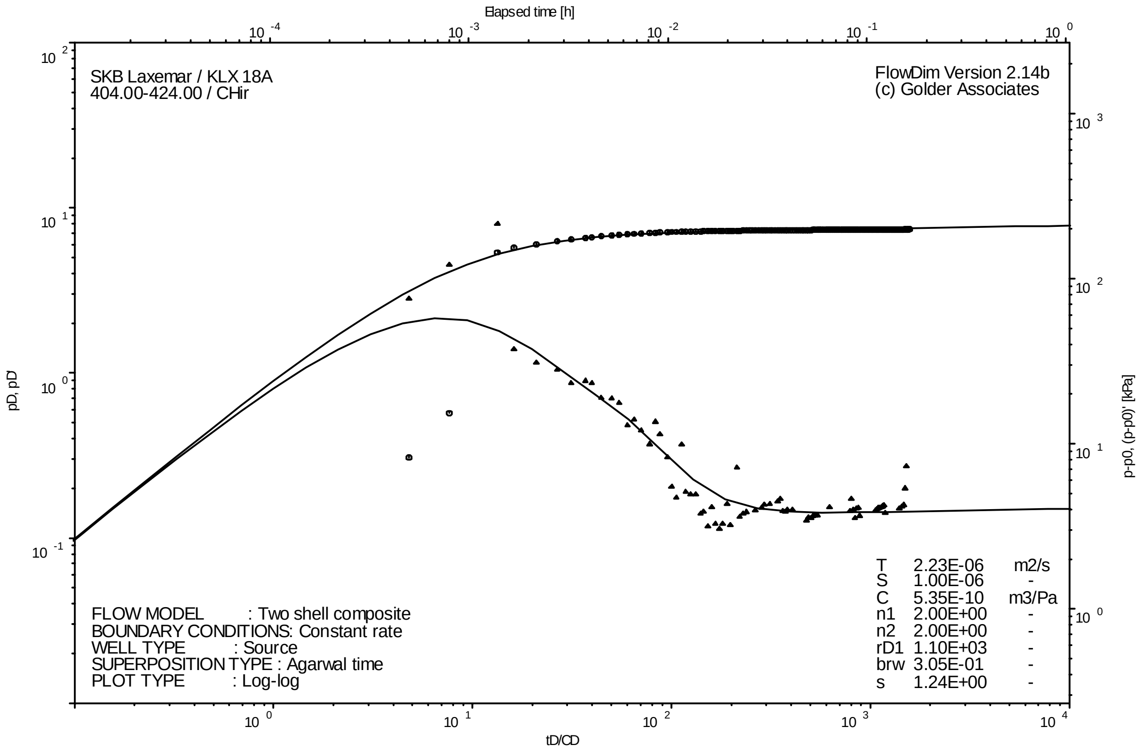
Pressure and flow rate vs. time; cartesian plot



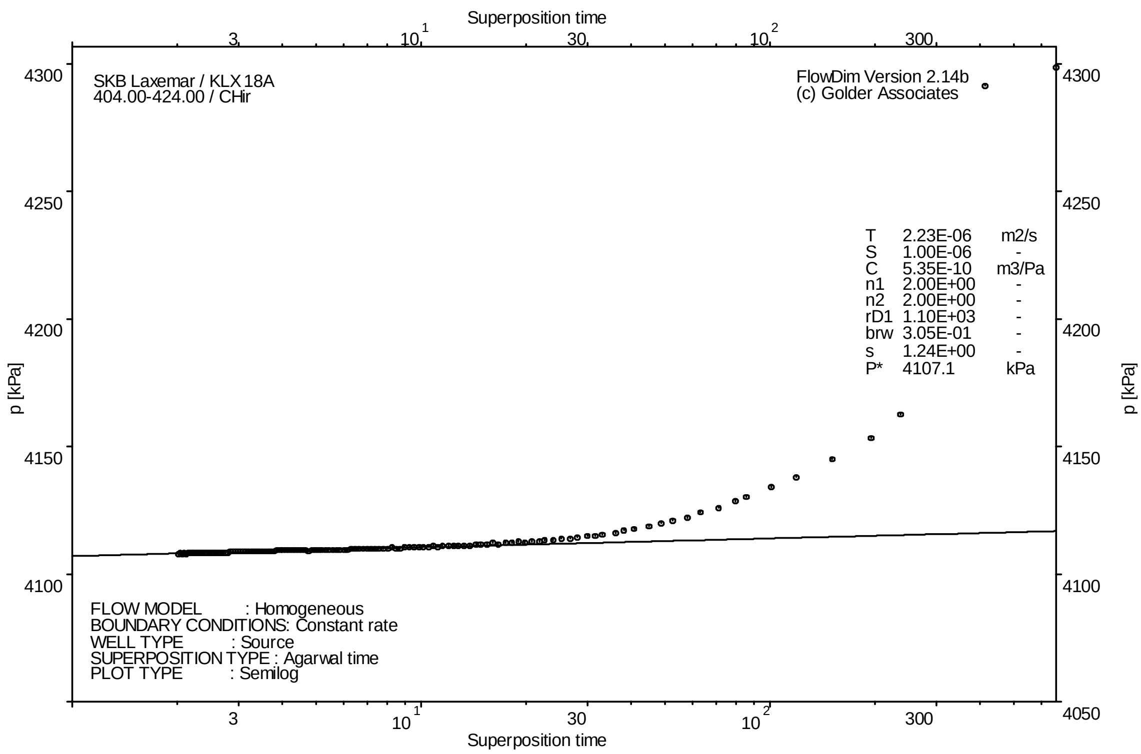
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

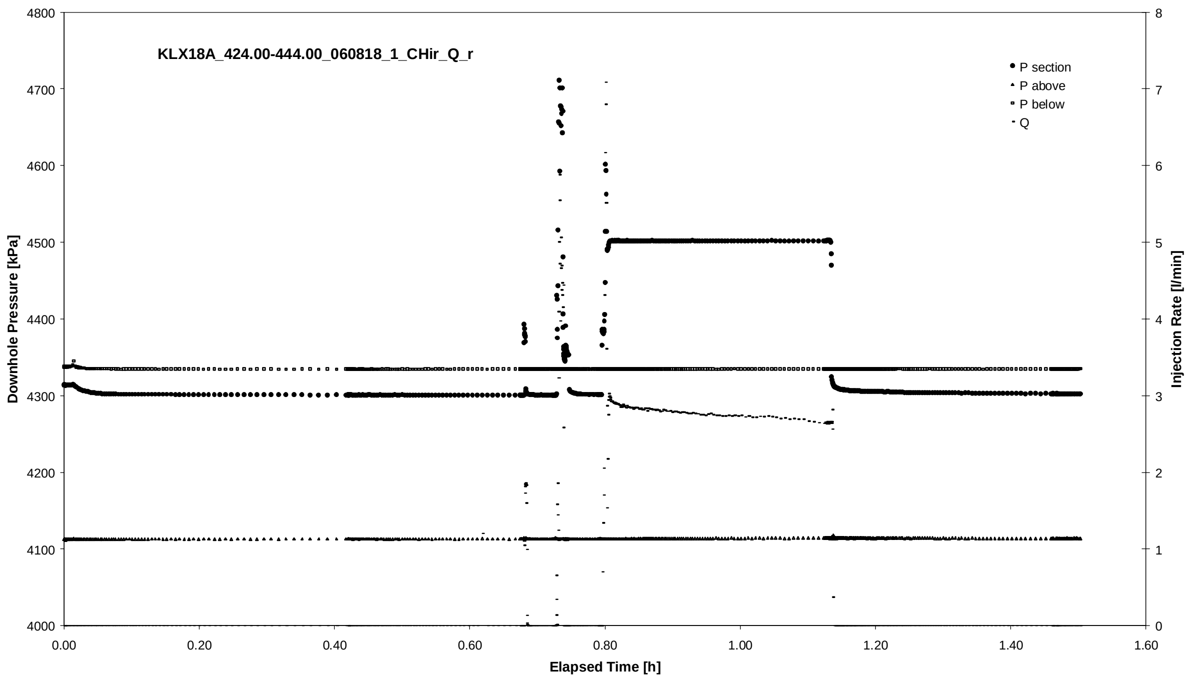


CHIR phase; HORNER match

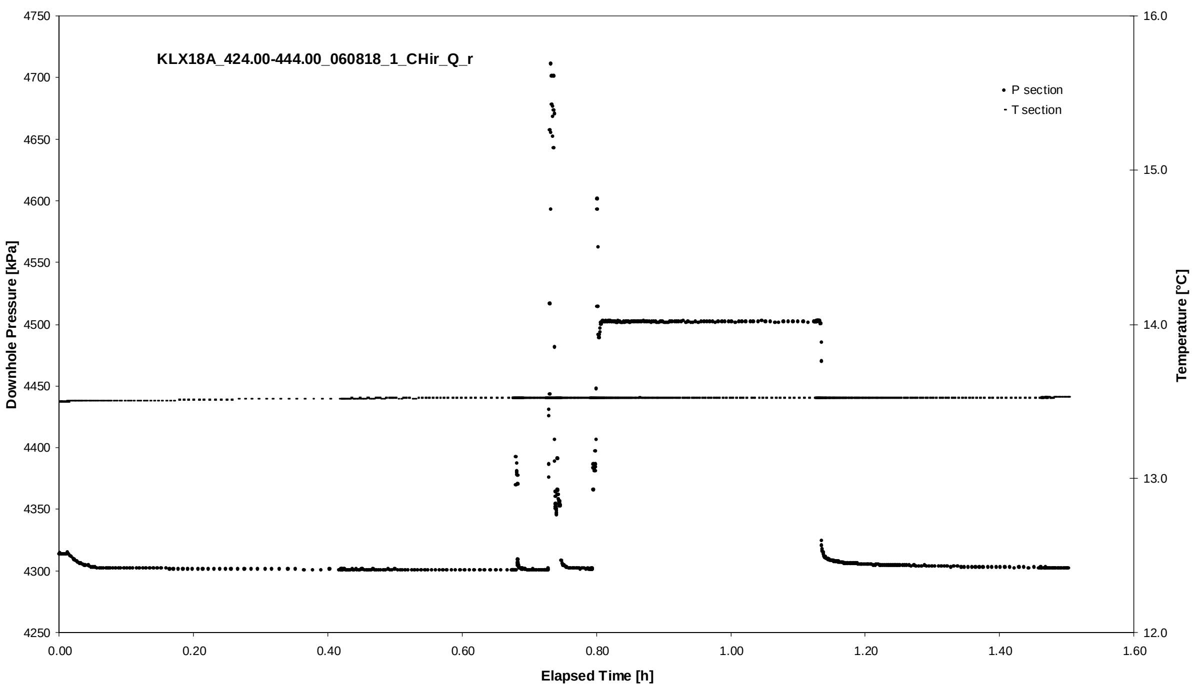
APPENDIX 2-22

Test 424.00 – 444.00 m

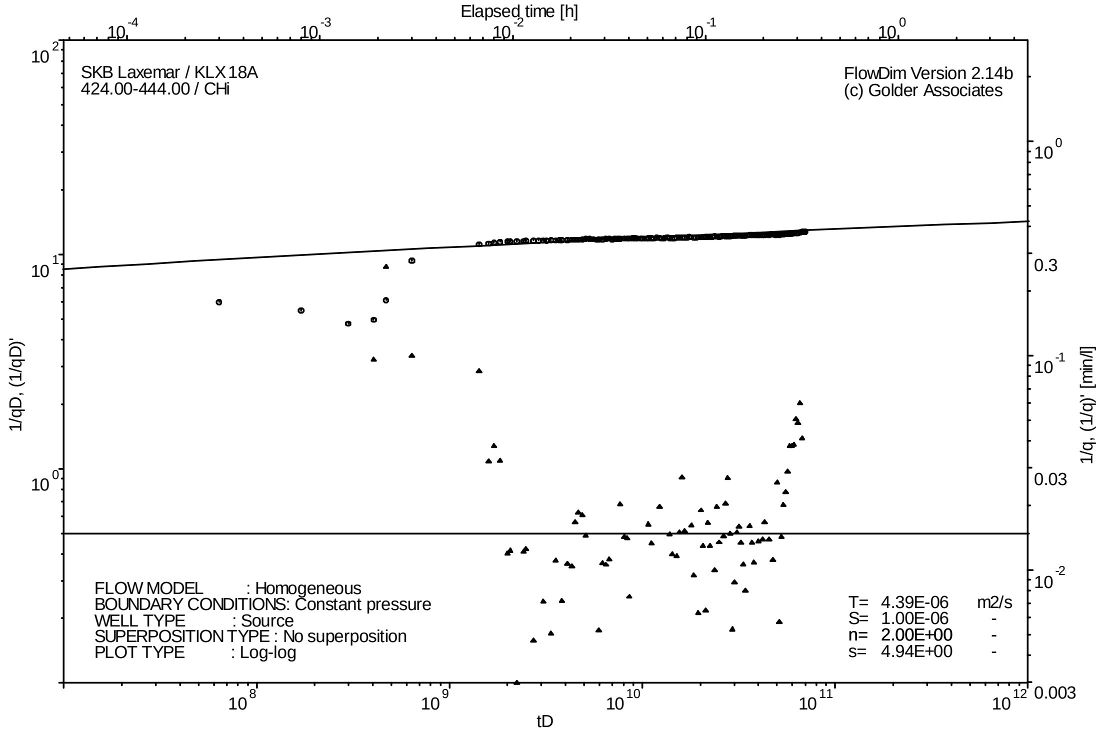
Analysis diagrams



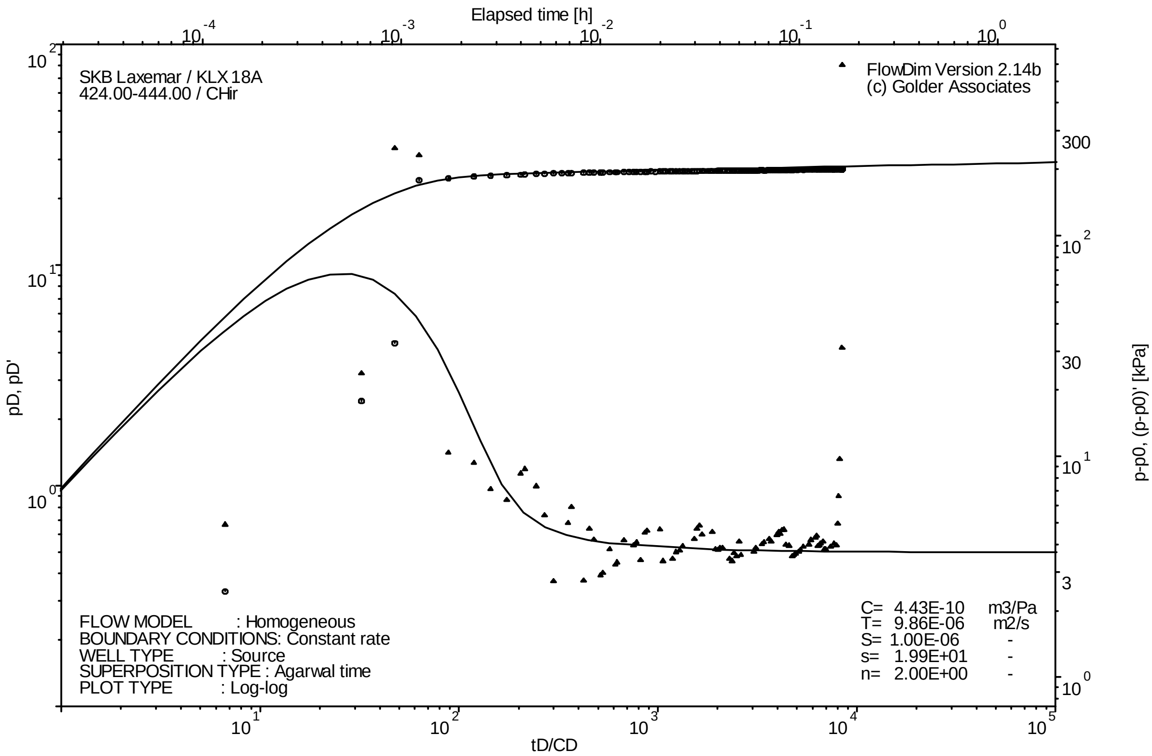
Pressure and flow rate vs. time; cartesian plot



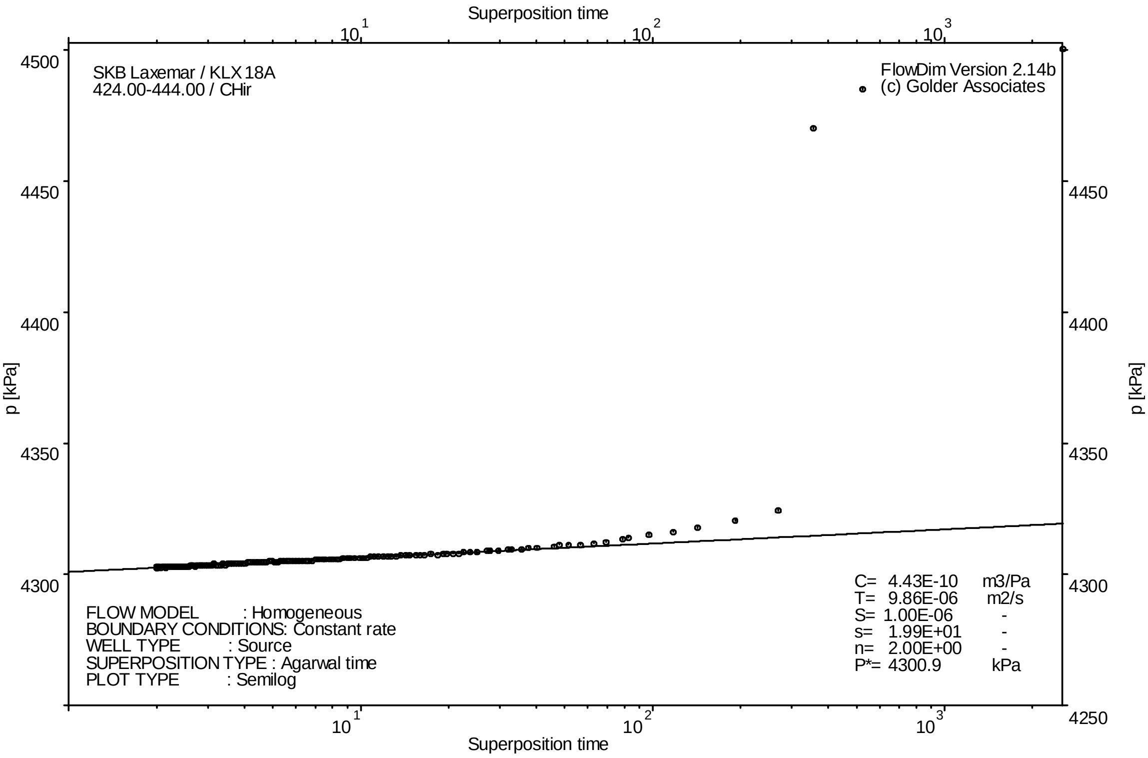
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

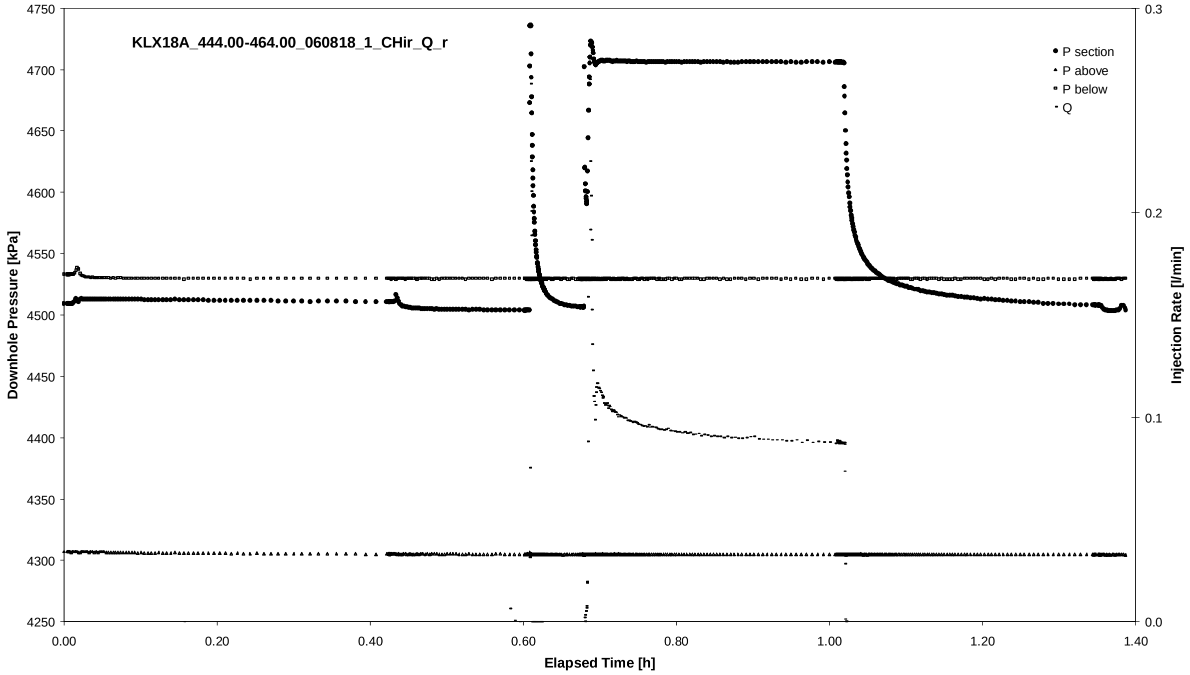


CHIR phase; HORNER match

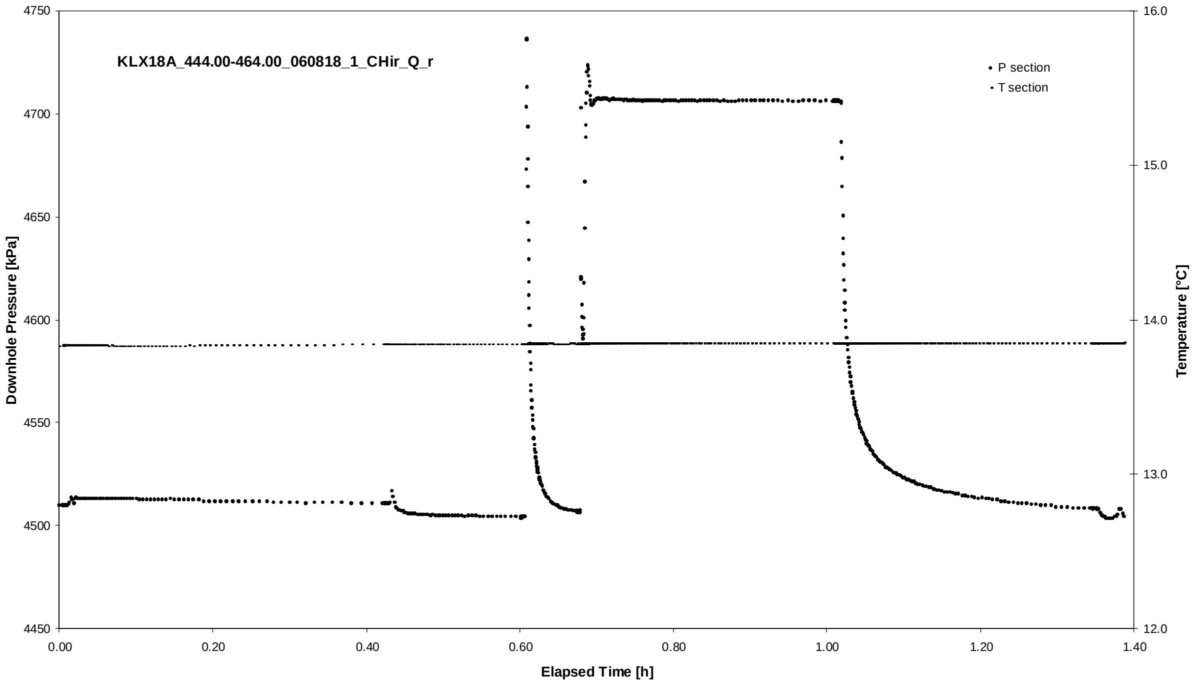
APPENDIX 2-23

Test 444.00 – 464.00 m

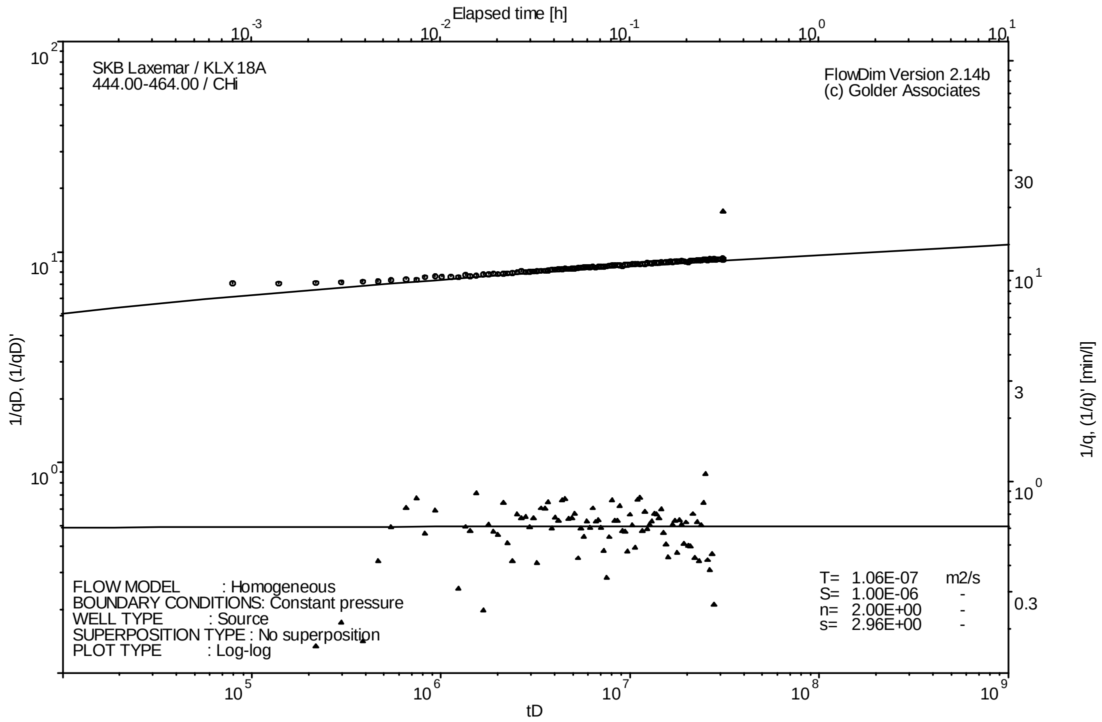
Analysis diagrams



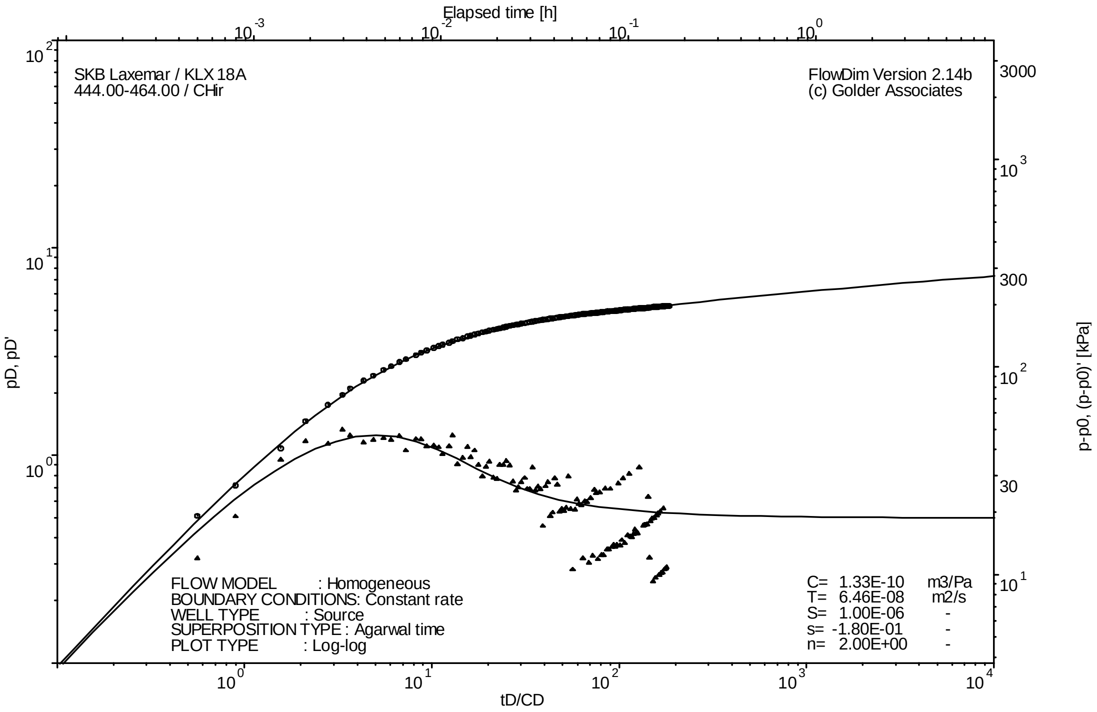
Pressure and flow rate vs. time; cartesian plot



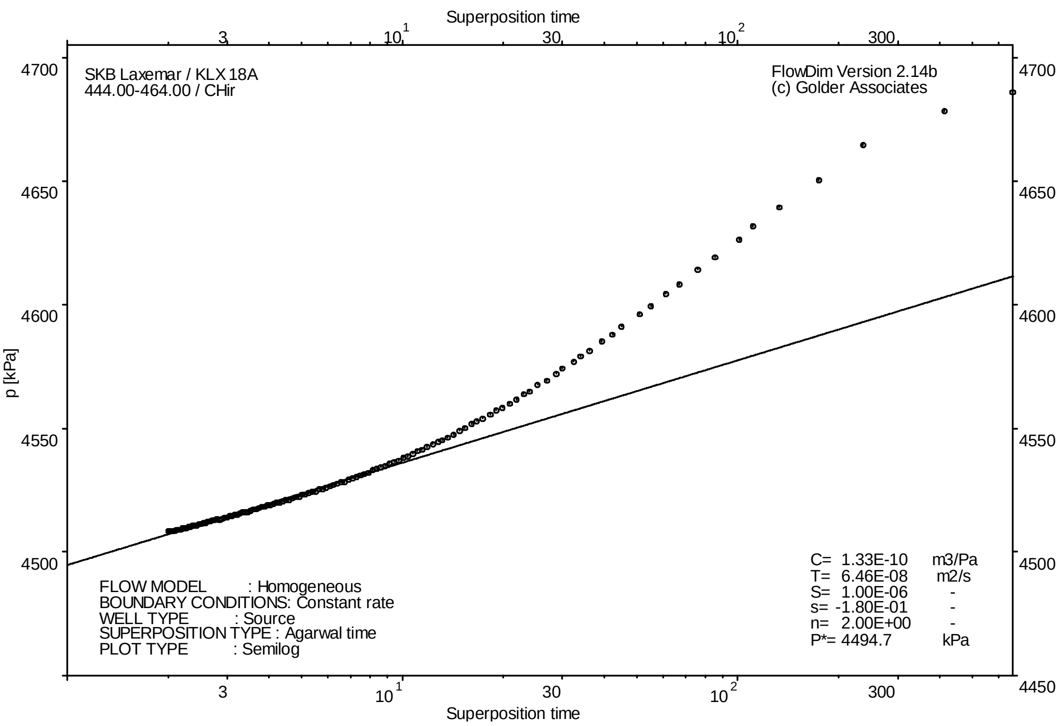
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

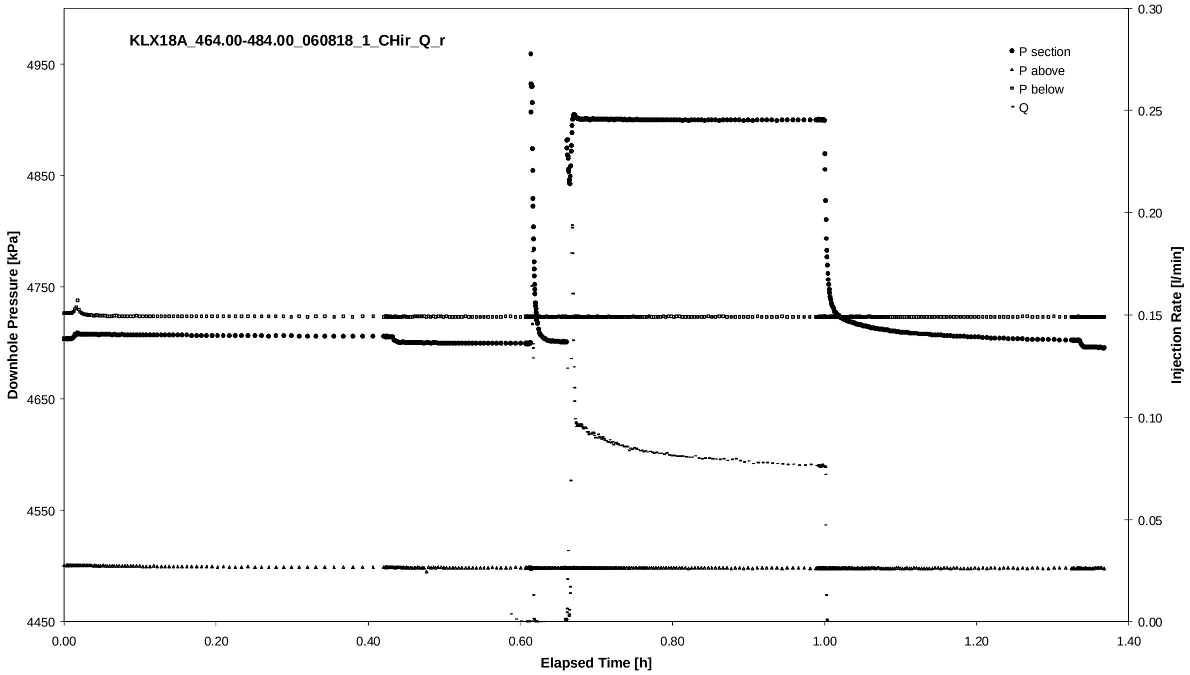


CHIR phase; HORNER match

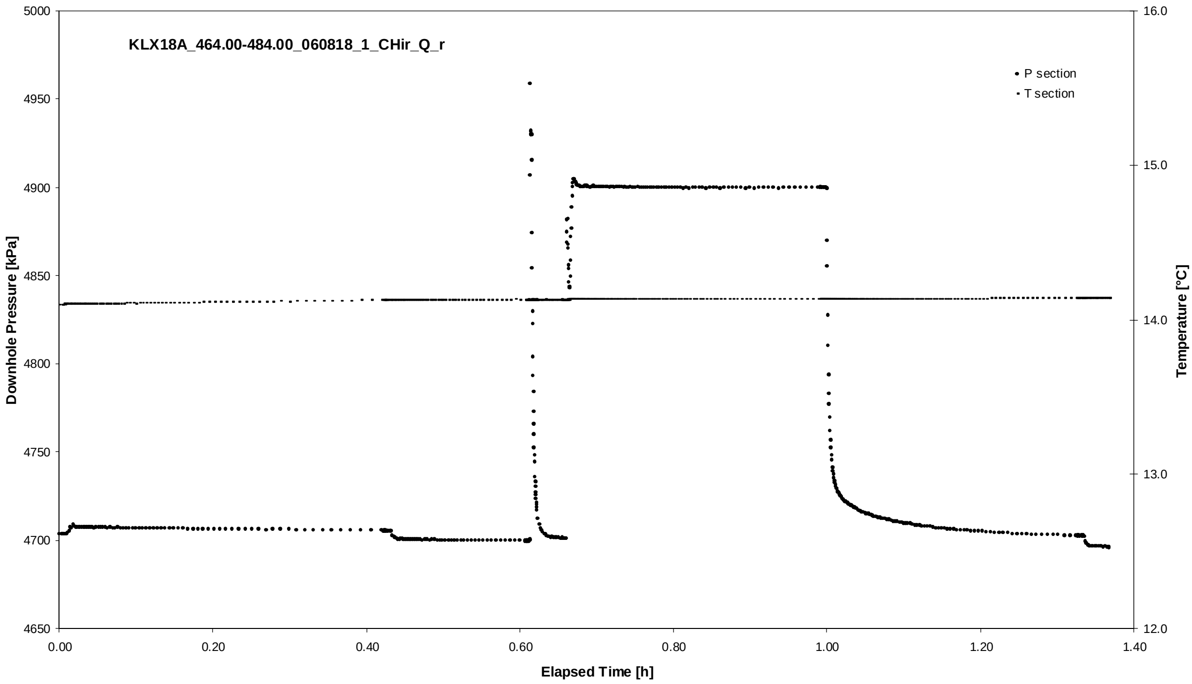
APPENDIX 2-24

Test 464.00 – 484.00 m

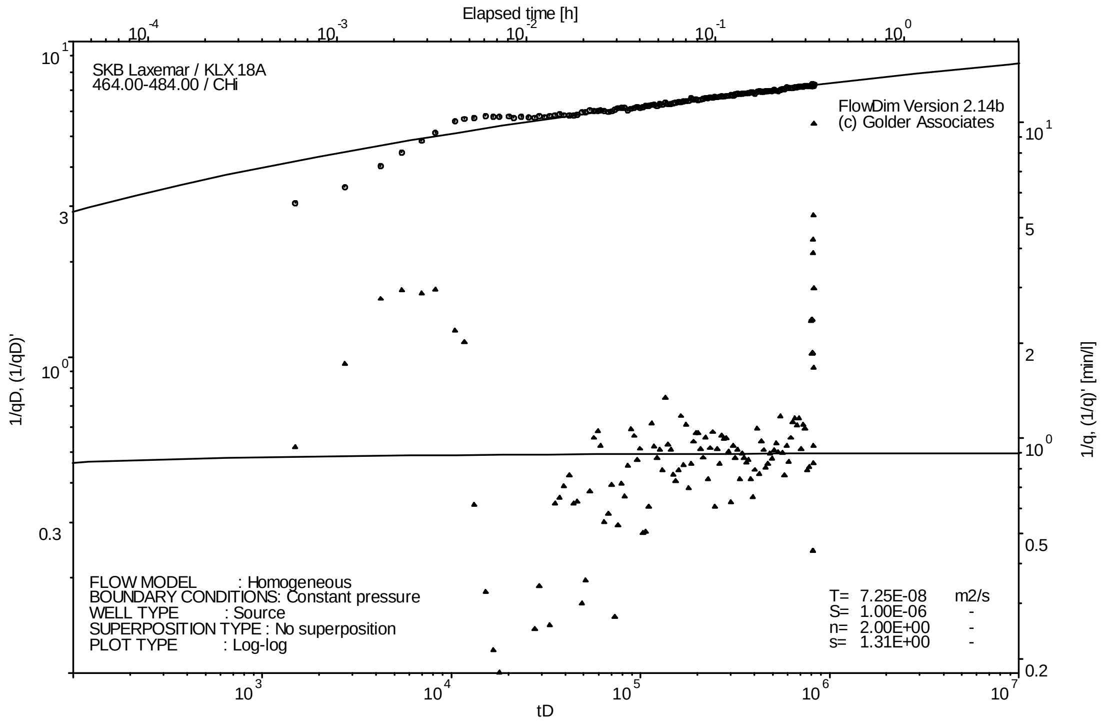
Analysis diagrams



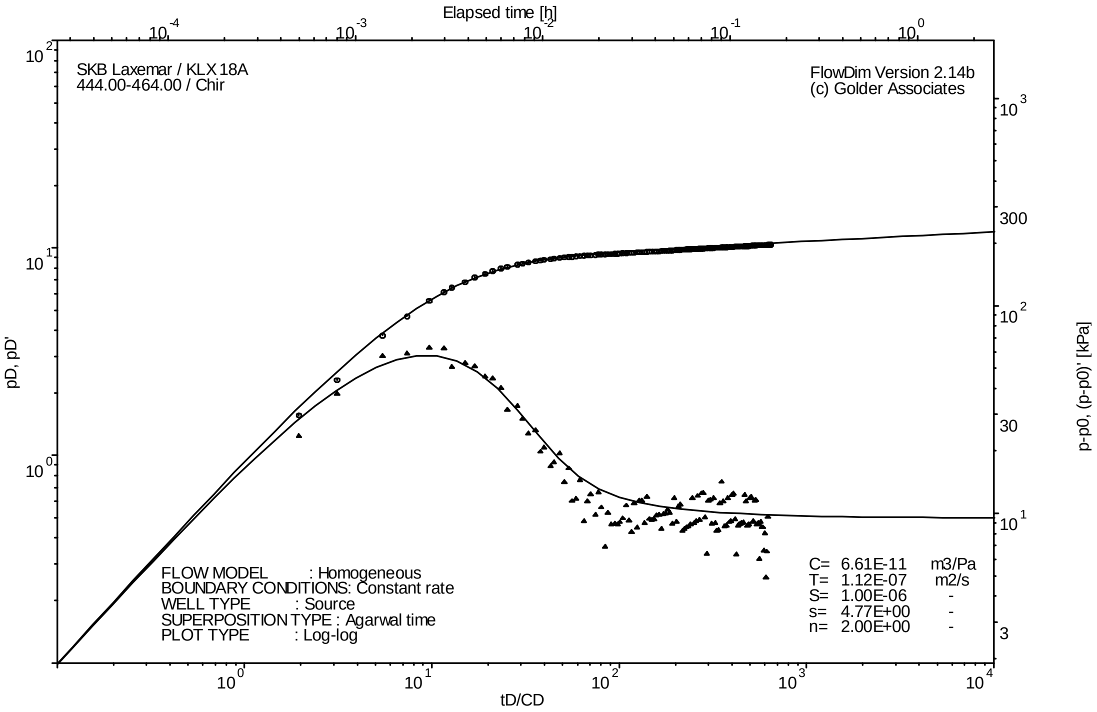
Pressure and flow rate vs. time; cartesian plot



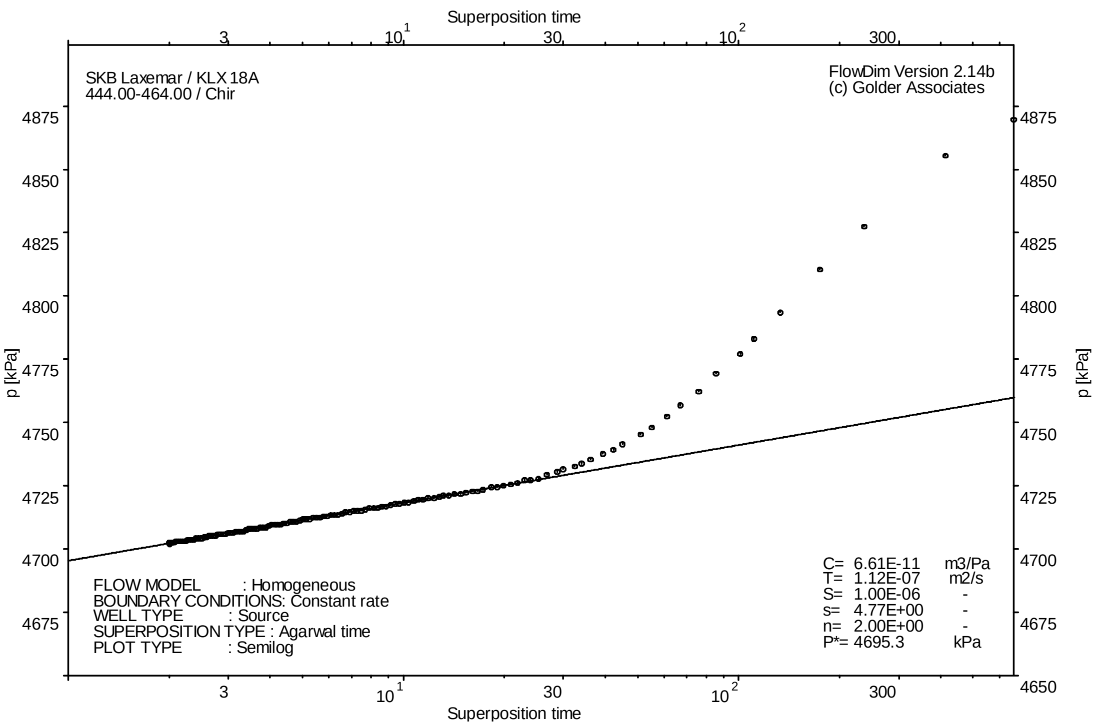
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

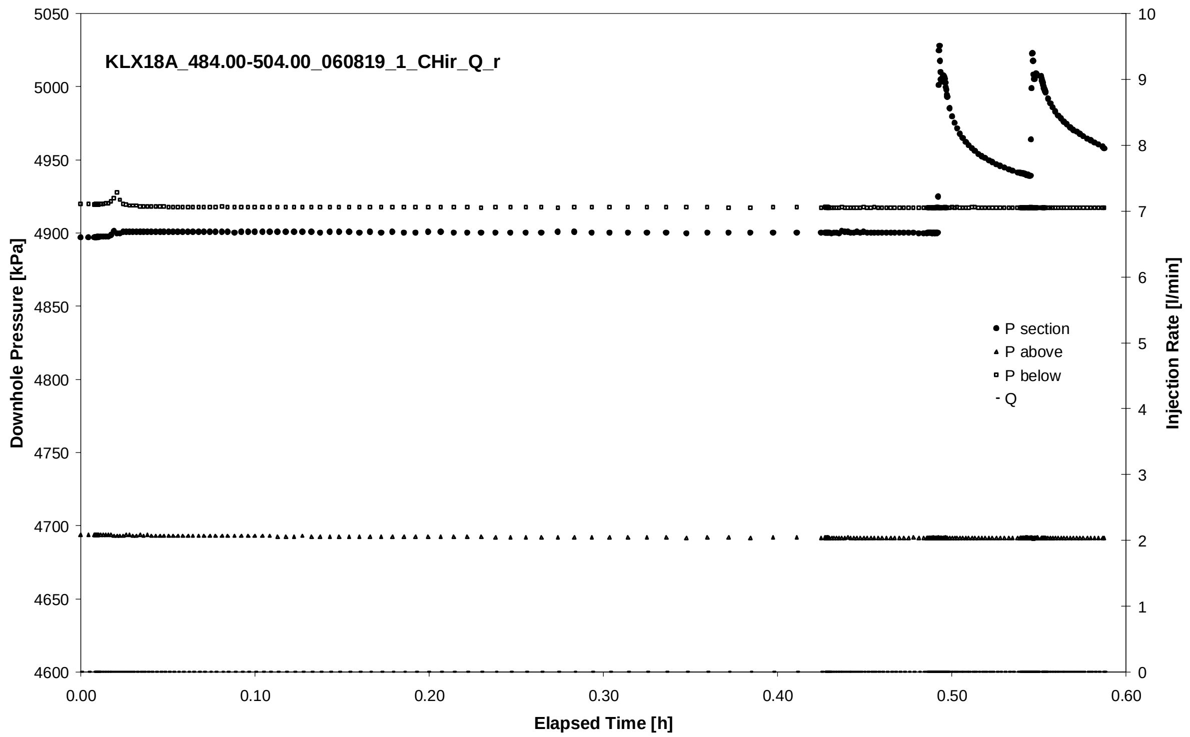


CHIR phase; HORNER match

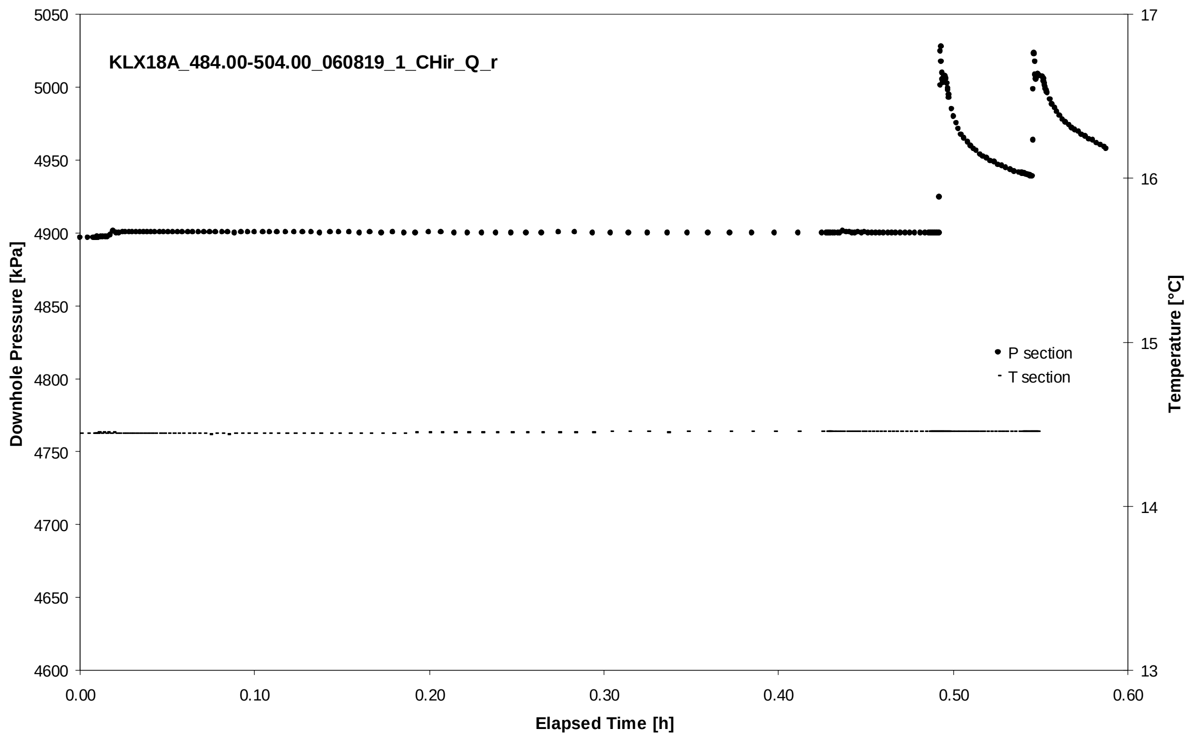
APPENDIX 2-25

Test 484.00 – 504.00 m

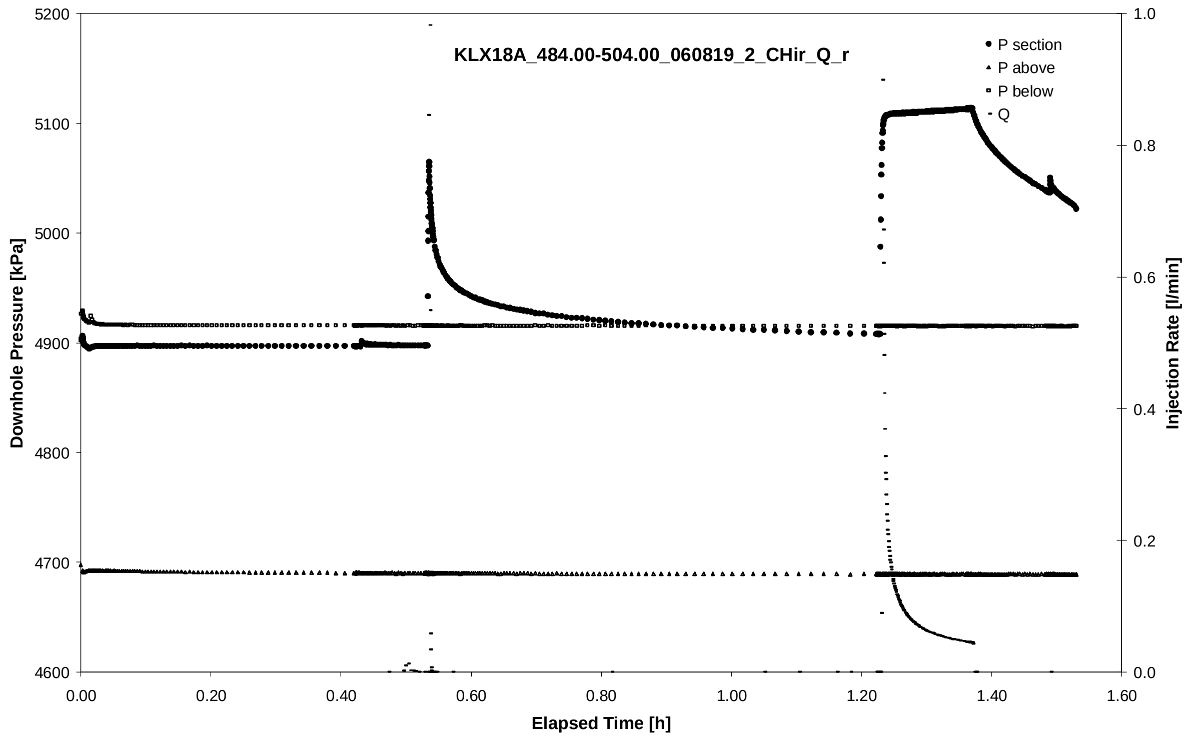
Analysis diagrams



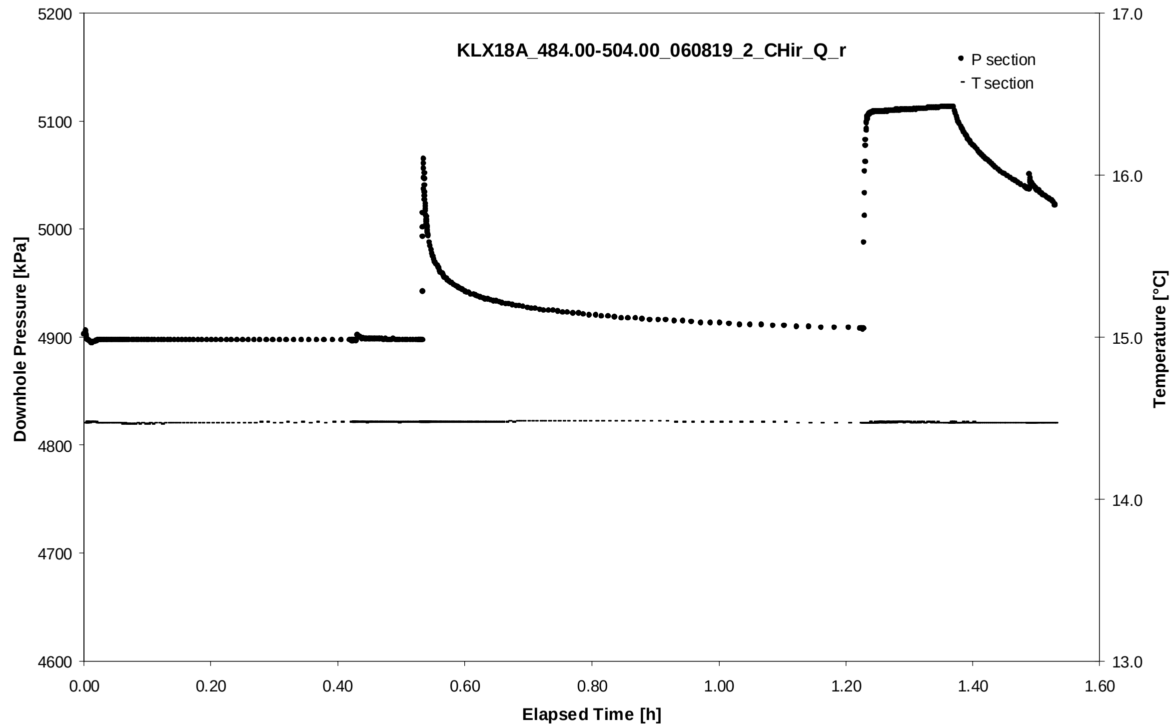
Pressure and flow rate vs. time; cartesian plot (test repeated)



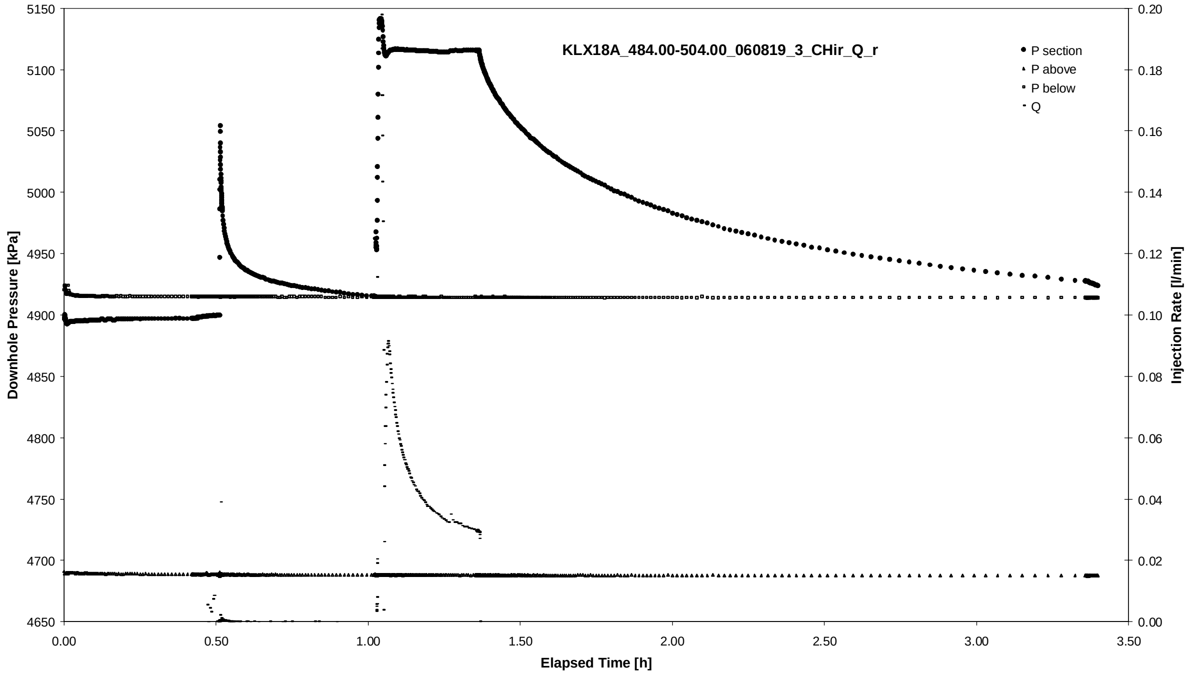
Interval pressure and temperature vs. time; cartesian plot (test repeated)



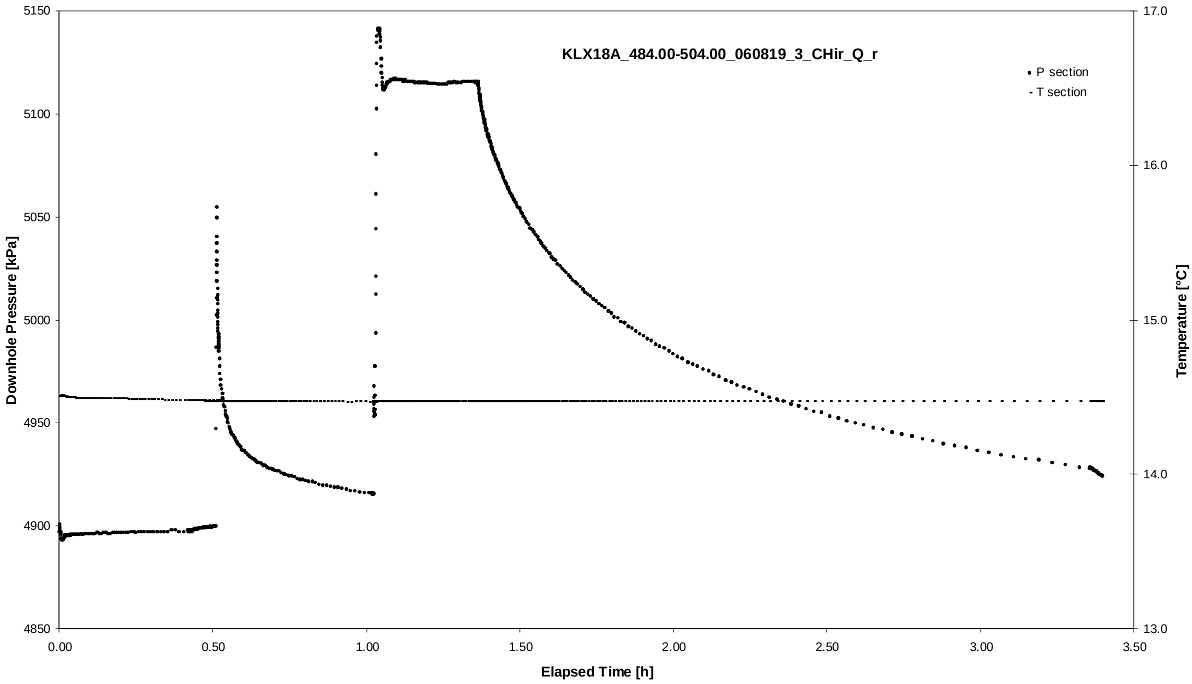
Pressure and flow rate vs. time; cartesian plot (test repeated)



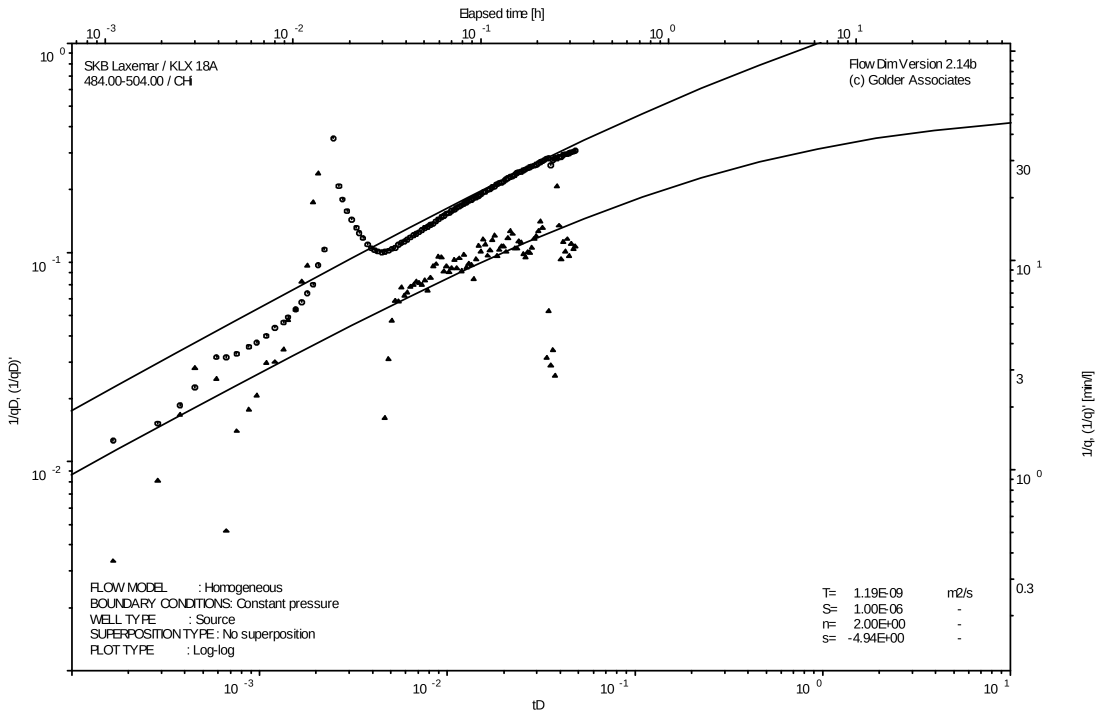
Interval pressure and temperature vs. time; cartesian plot (test repeated)



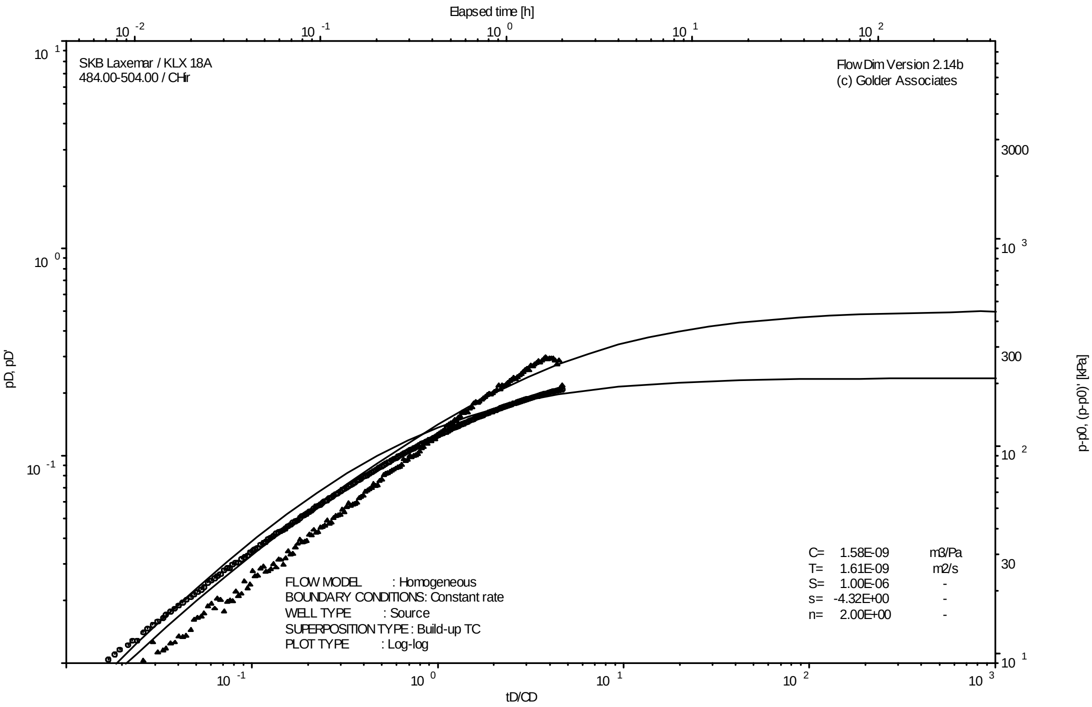
Pressure and flow rate vs. time; cartesian plot



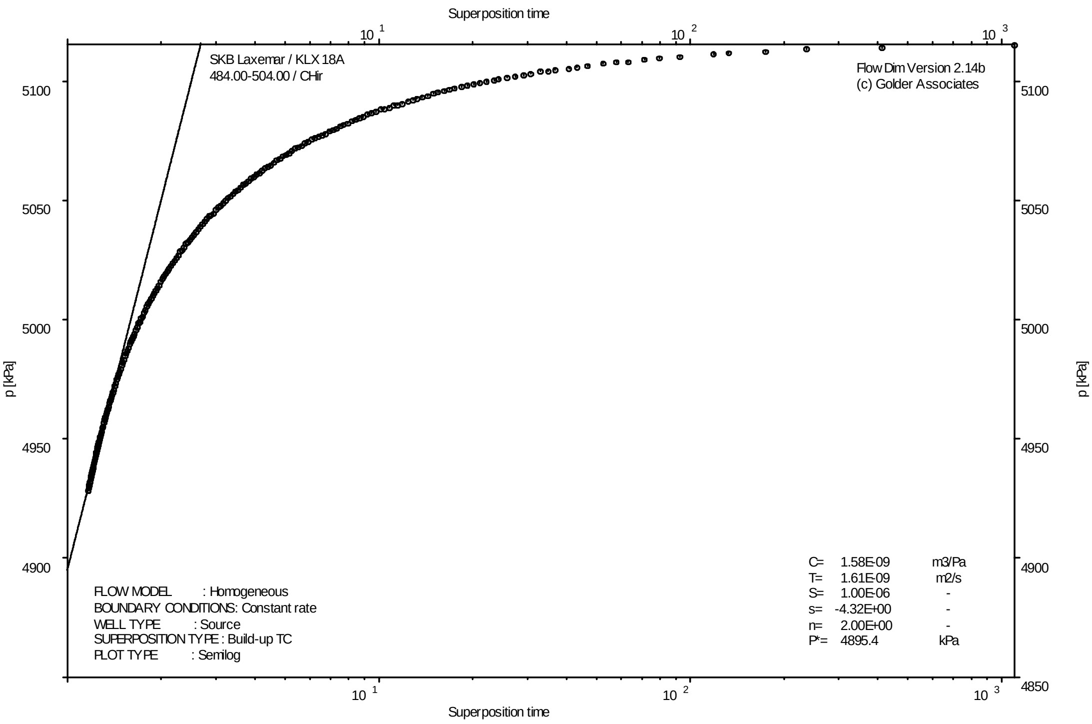
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

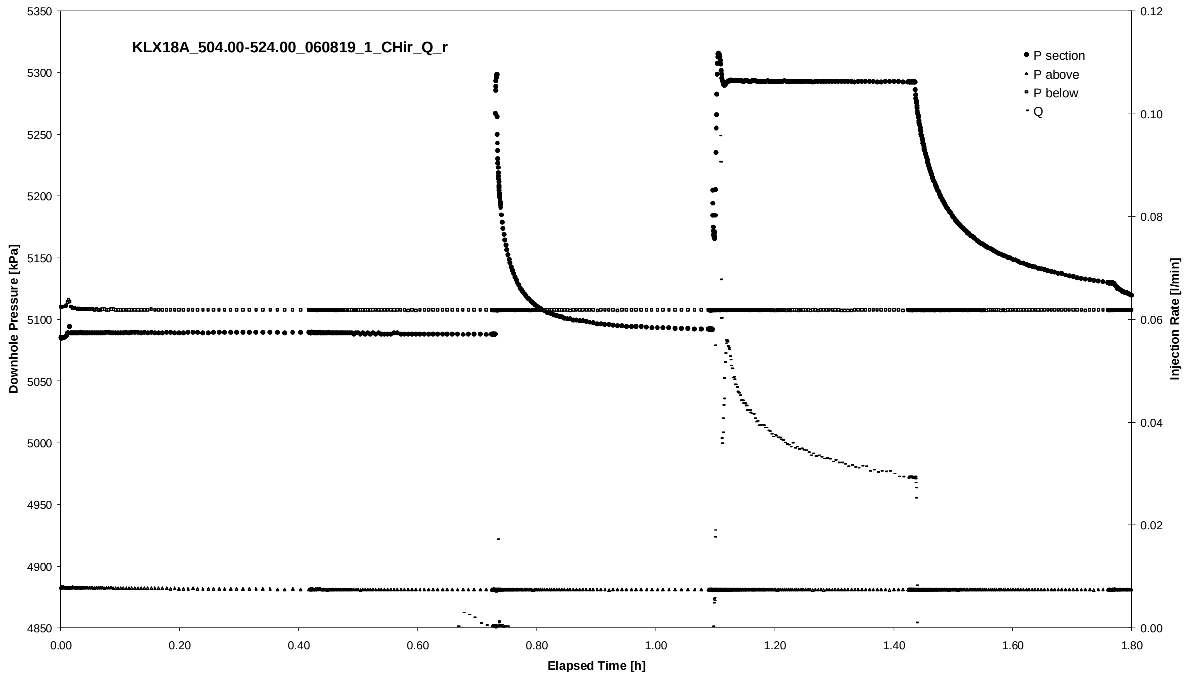


CHIR phase; HORNER match

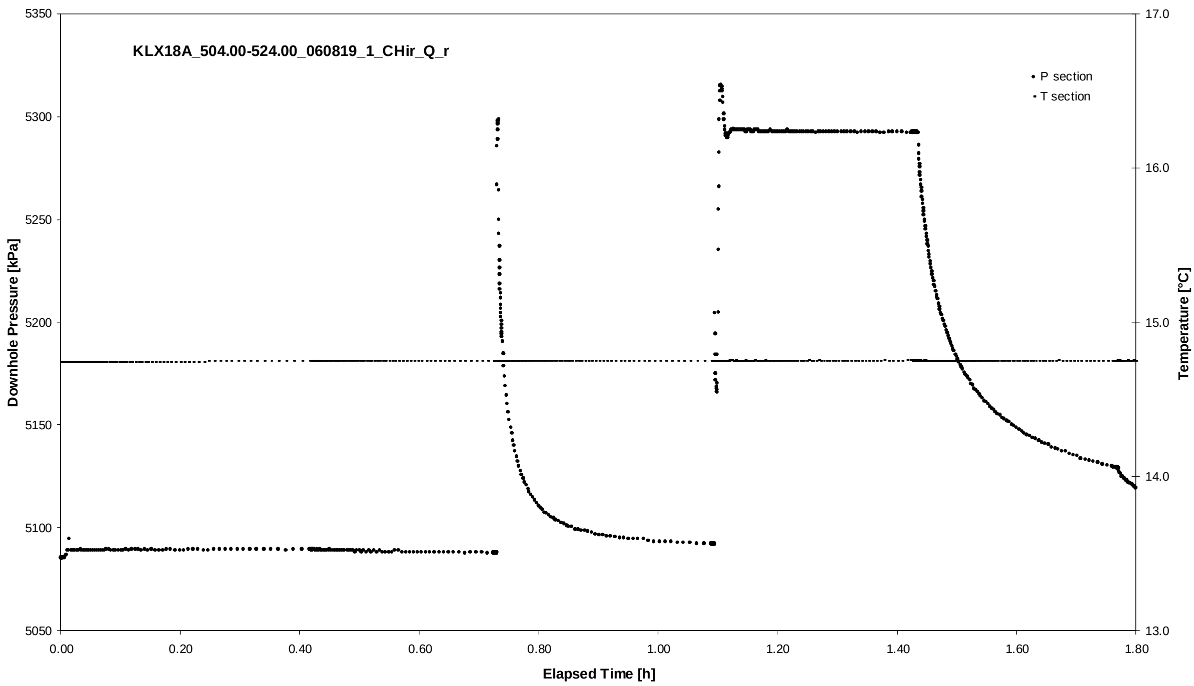
APPENDIX 2-26

Test 504.00 – 524.00 m

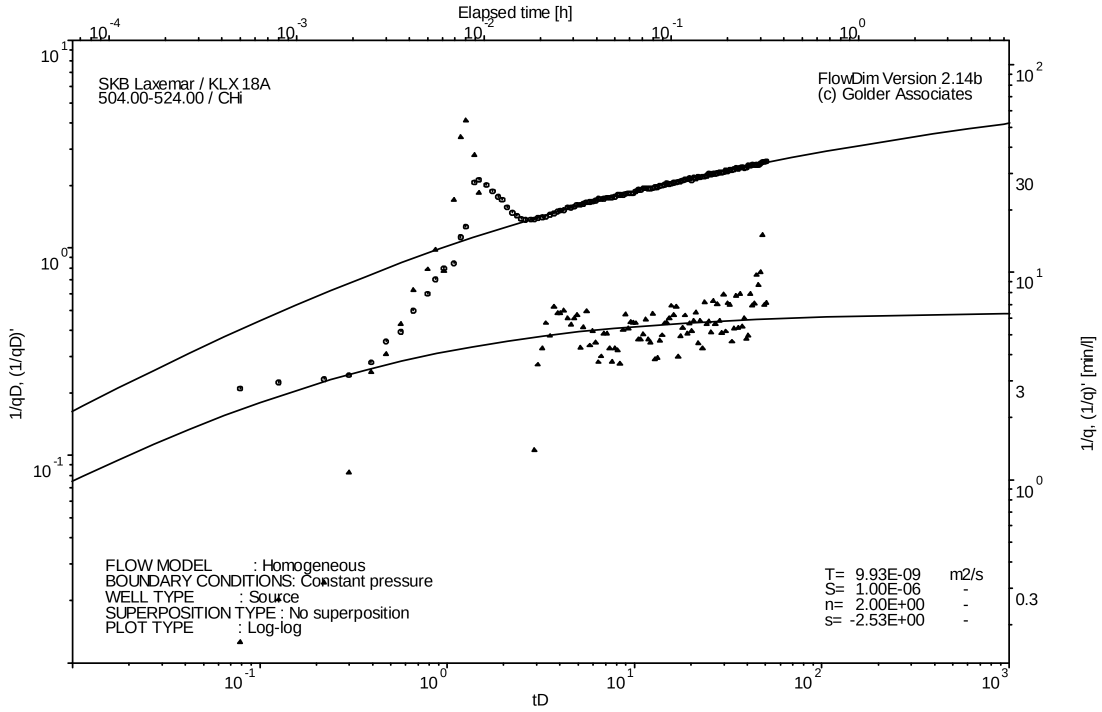
Analysis diagrams



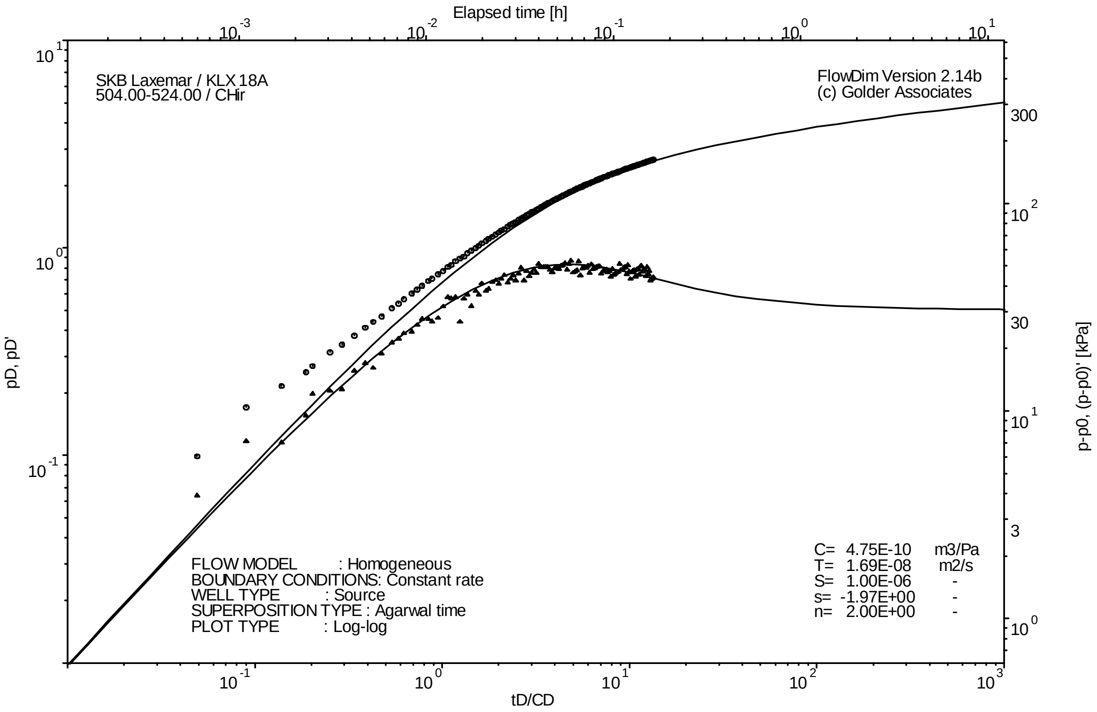
Pressure and flow rate vs. time; cartesian plot



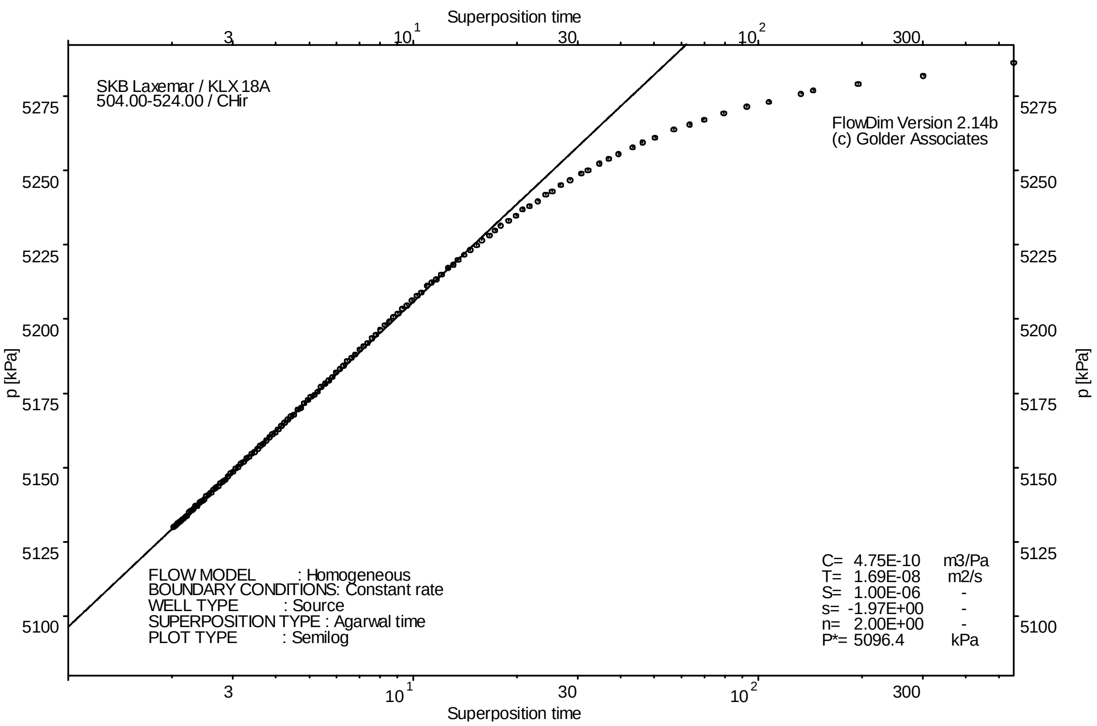
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

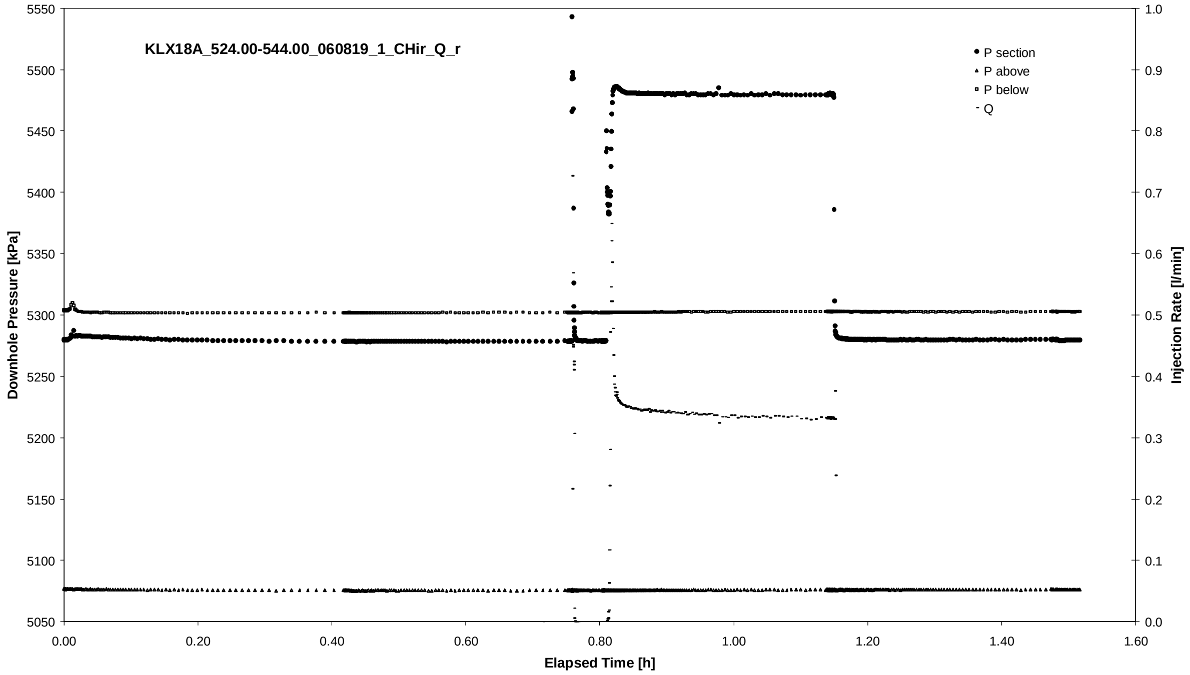


CHIR phase; HORNER match

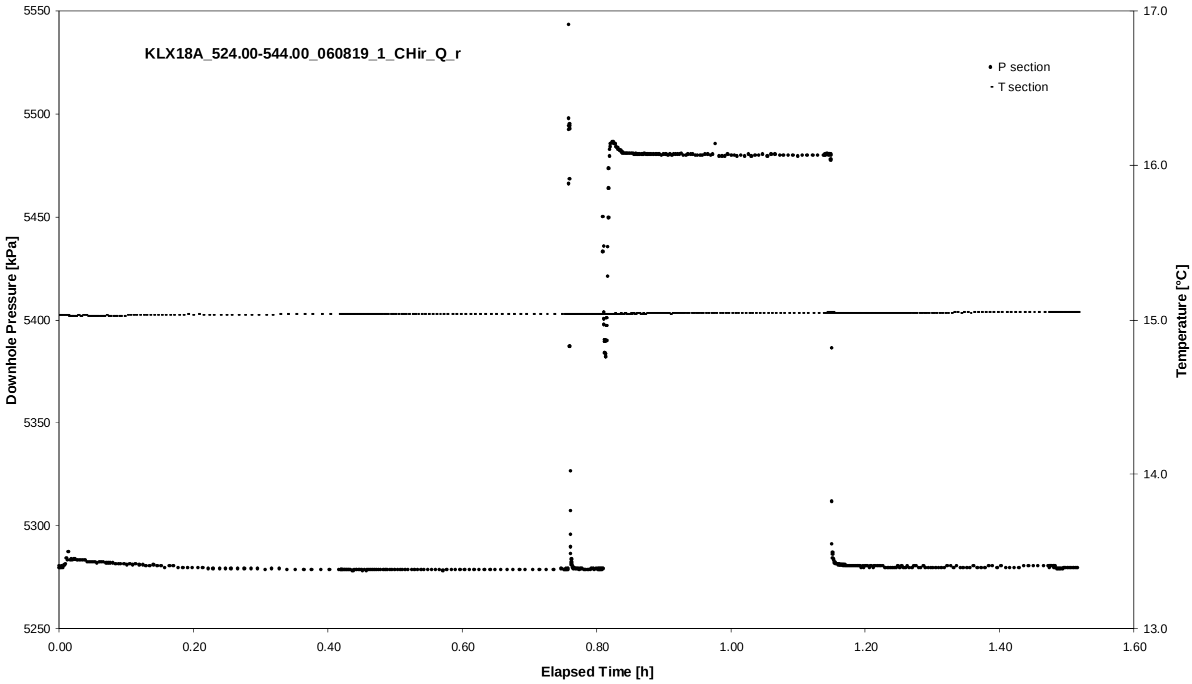
APPENDIX 2-27

Test 524.00 – 544.00 m

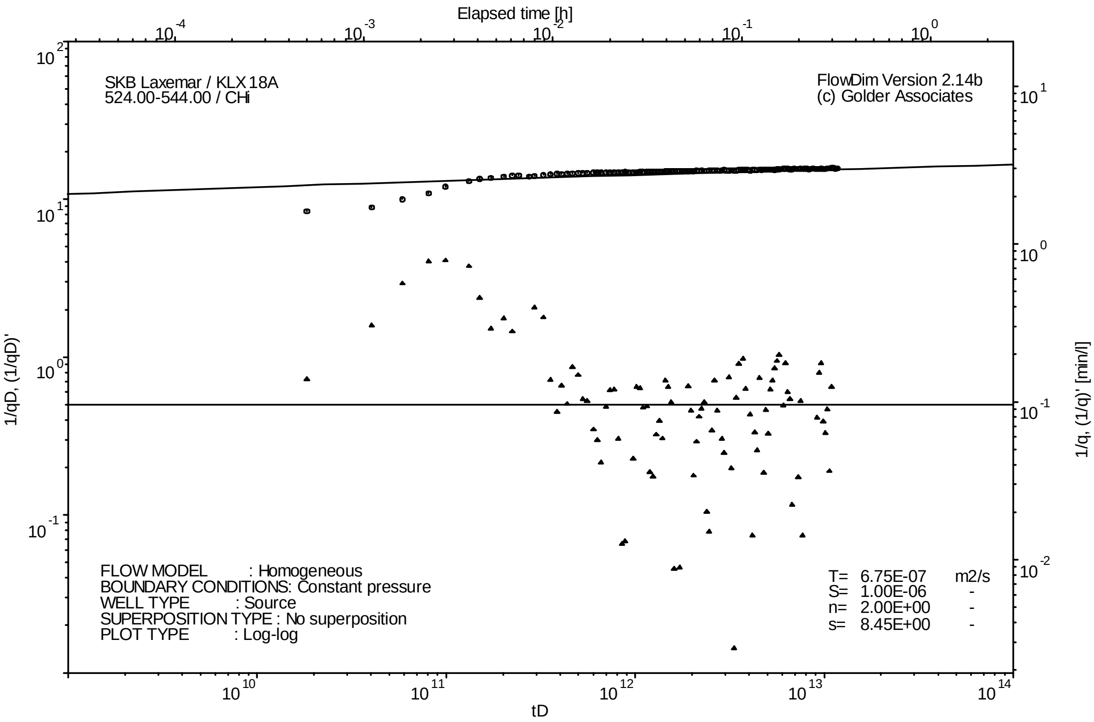
Analysis diagrams



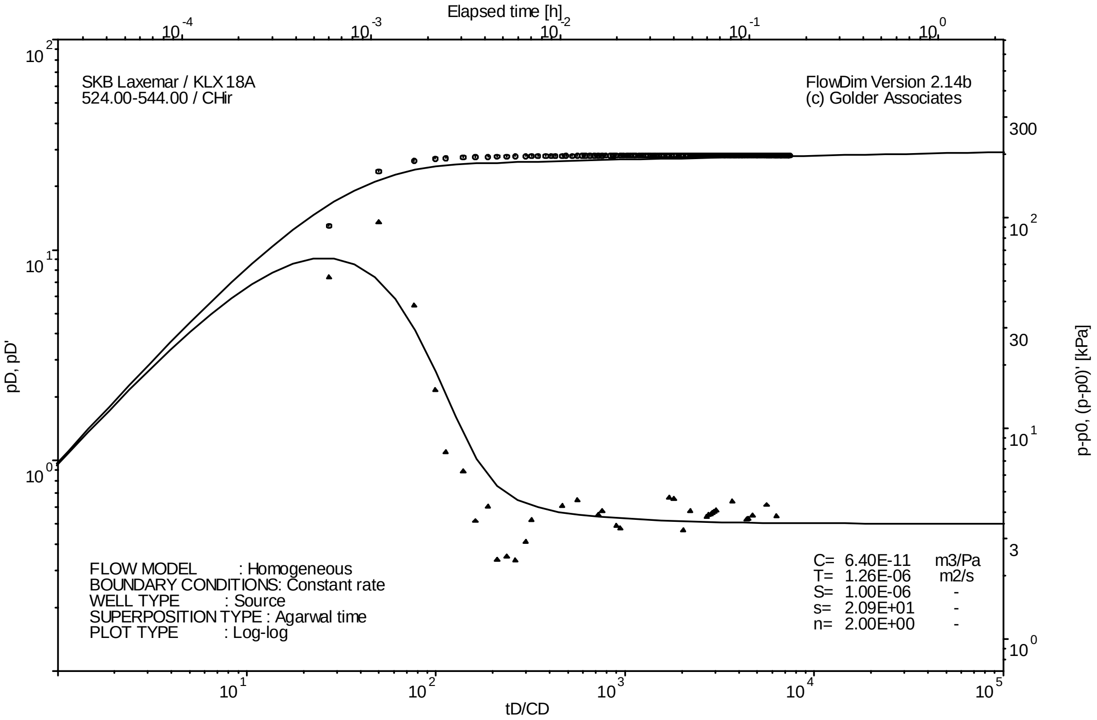
Pressure and flow rate vs. time; cartesian plot



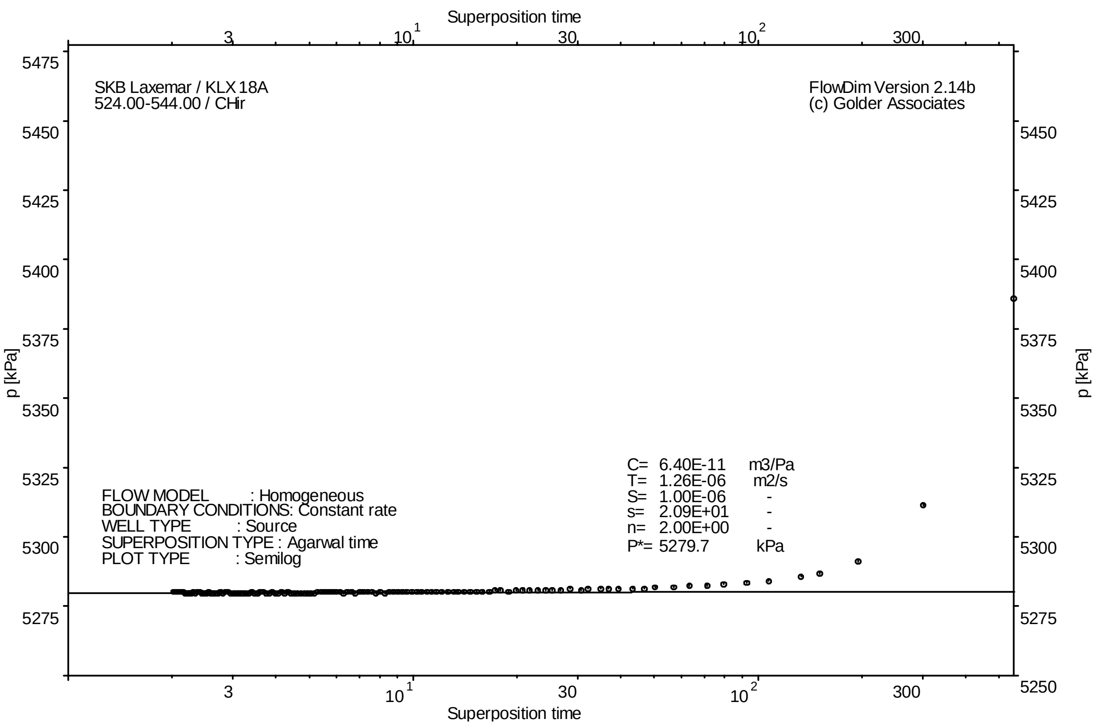
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

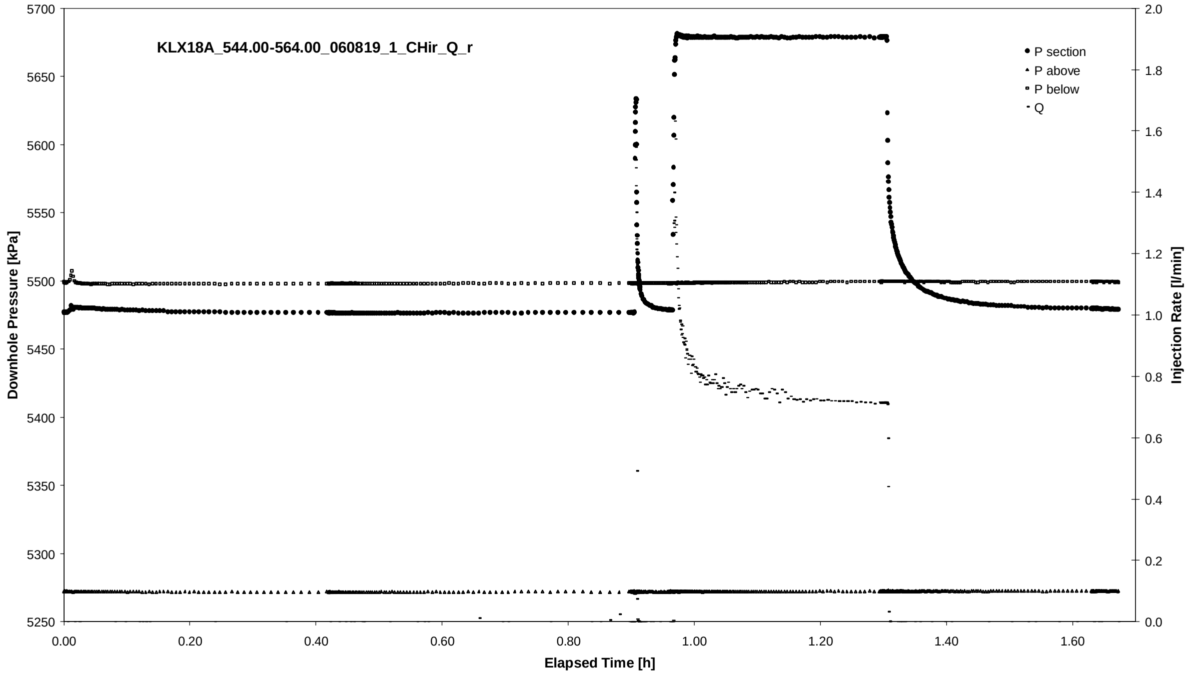


CHIR phase; HORNER match

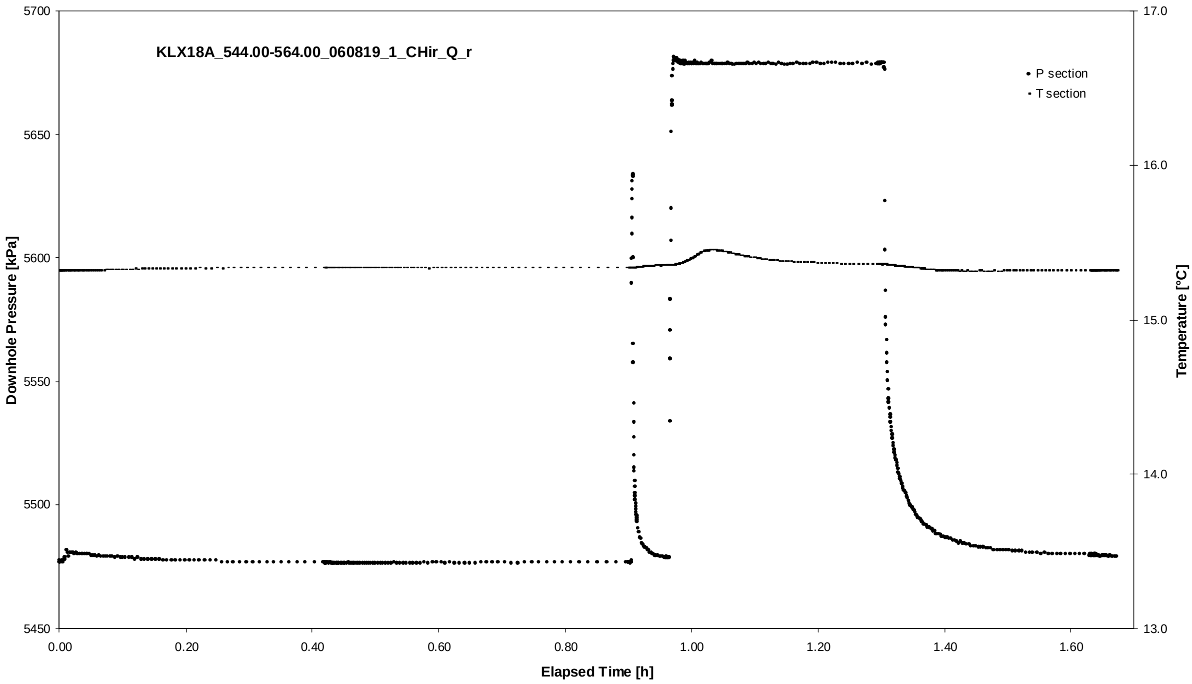
APPENDIX 2-28

Test 544.00 – 564.00 m

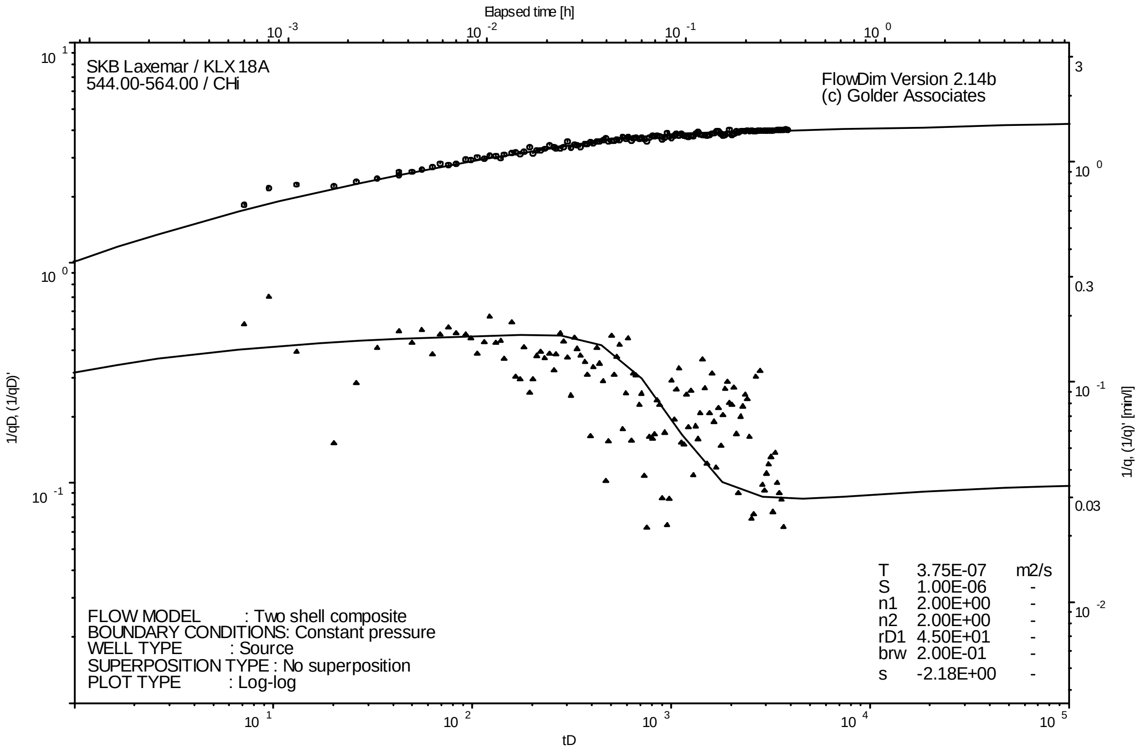
Analysis diagrams



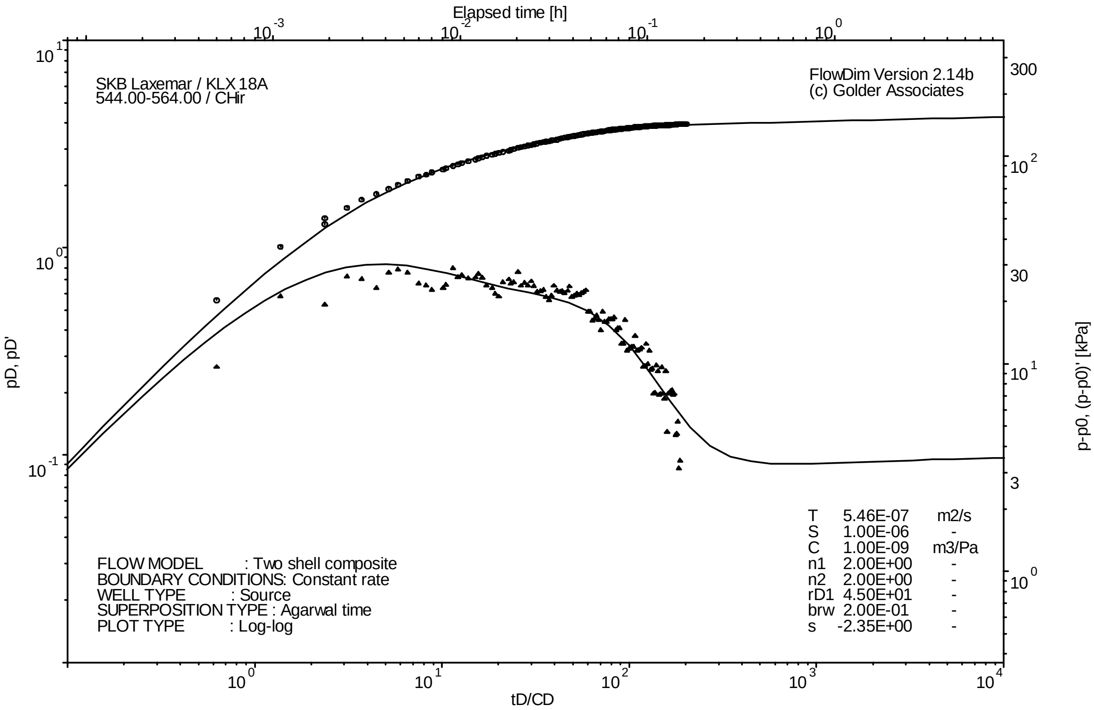
Pressure and flow rate vs. time; cartesian plot



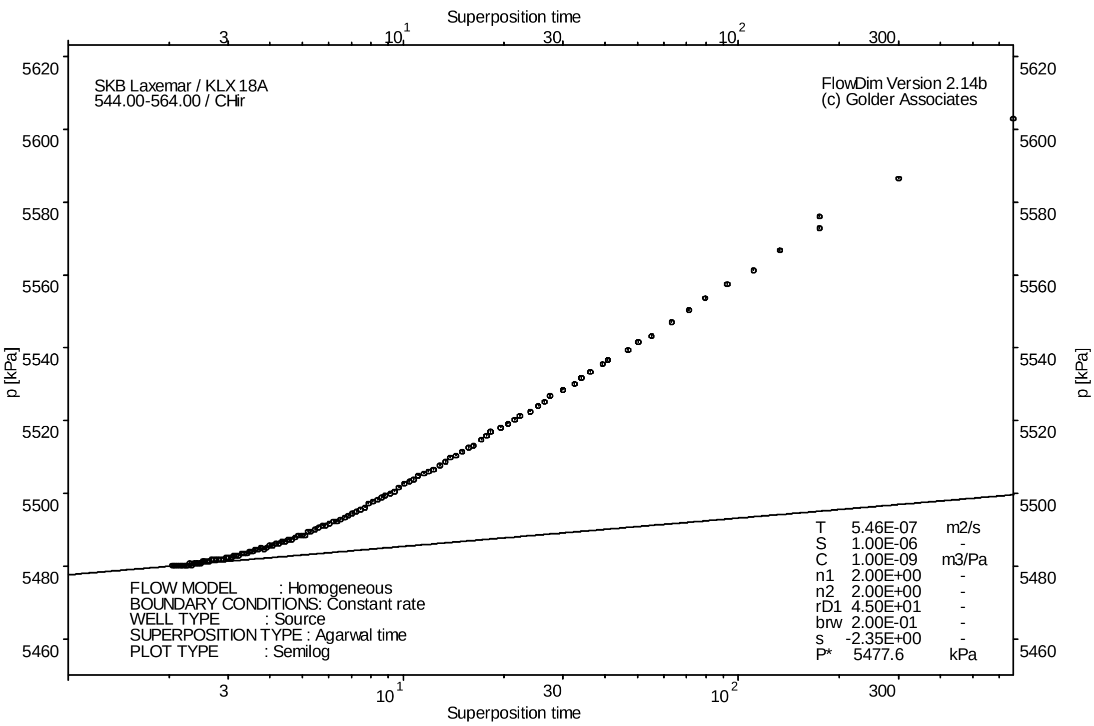
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

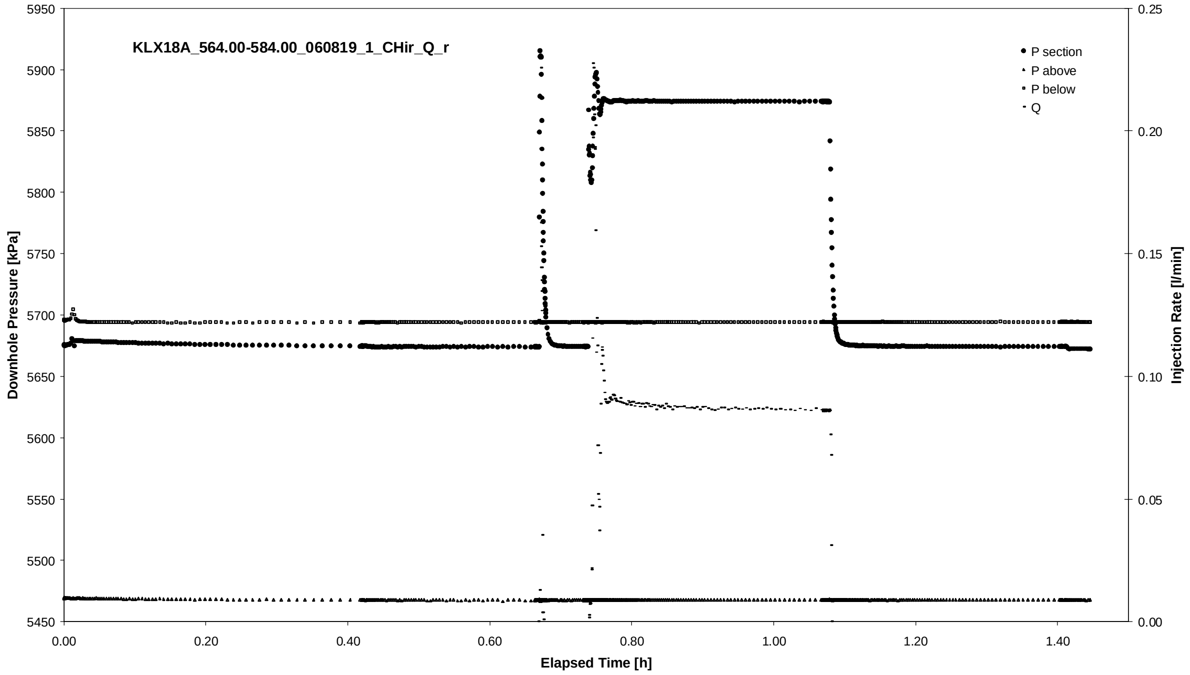


CHIR phase; HORNER match

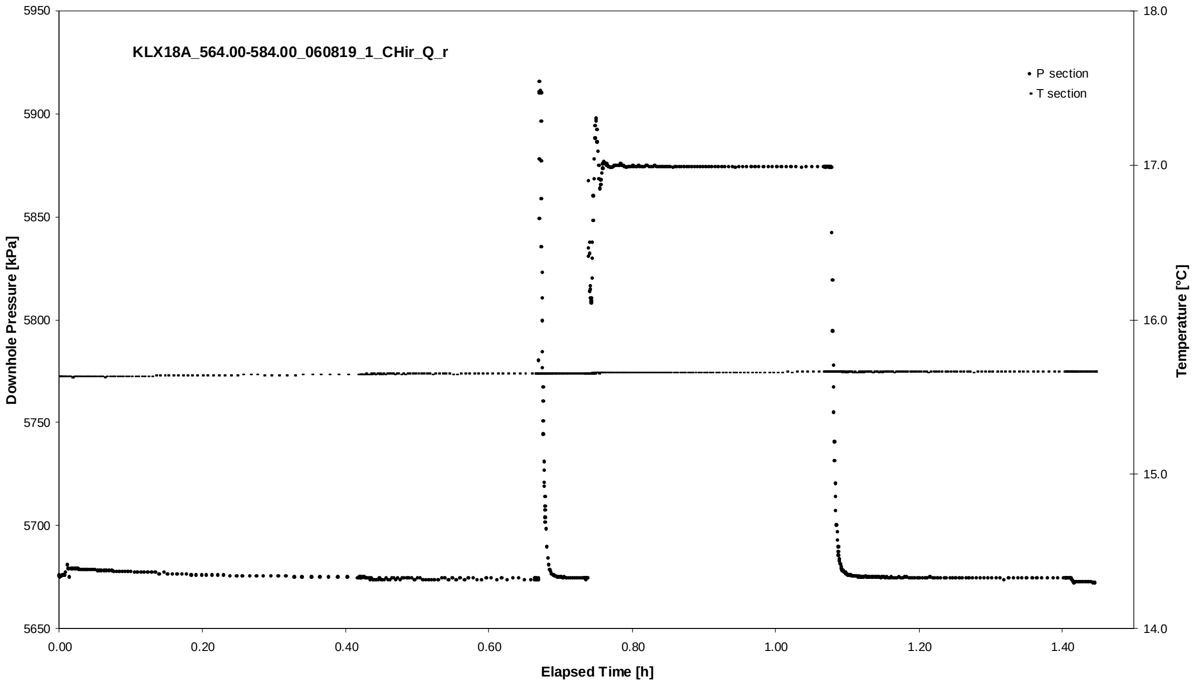
APPENDIX 2-29

Test 564.00 – 584.00 m

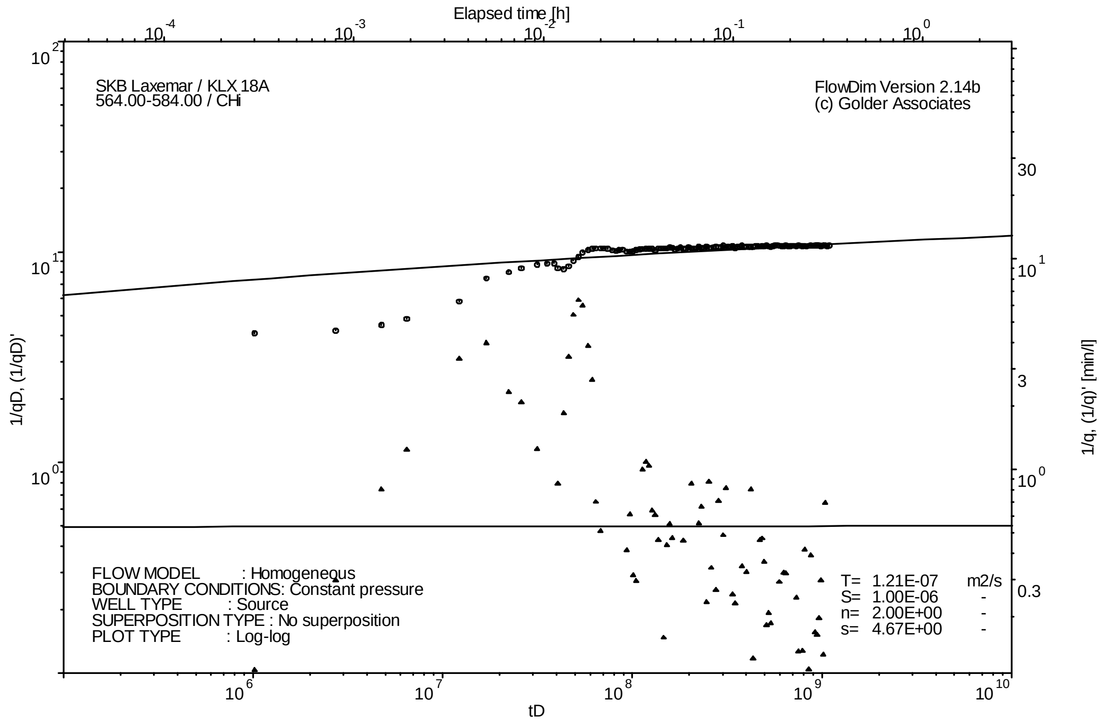
Analysis diagrams



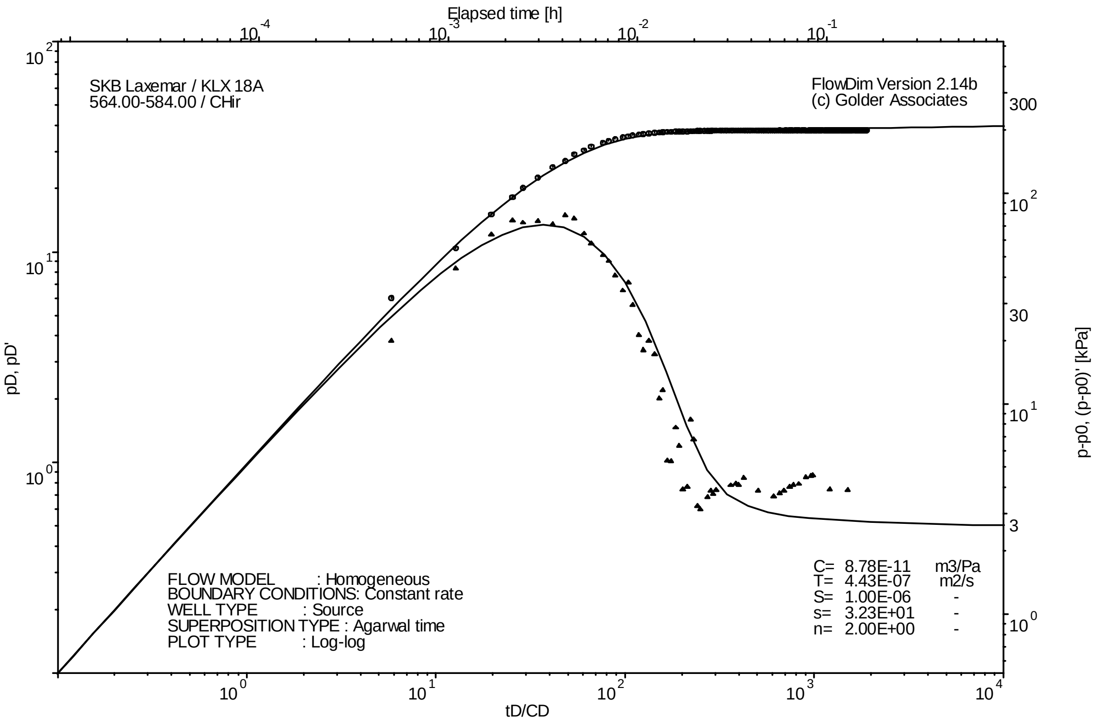
Pressure and flow rate vs. time; cartesian plot



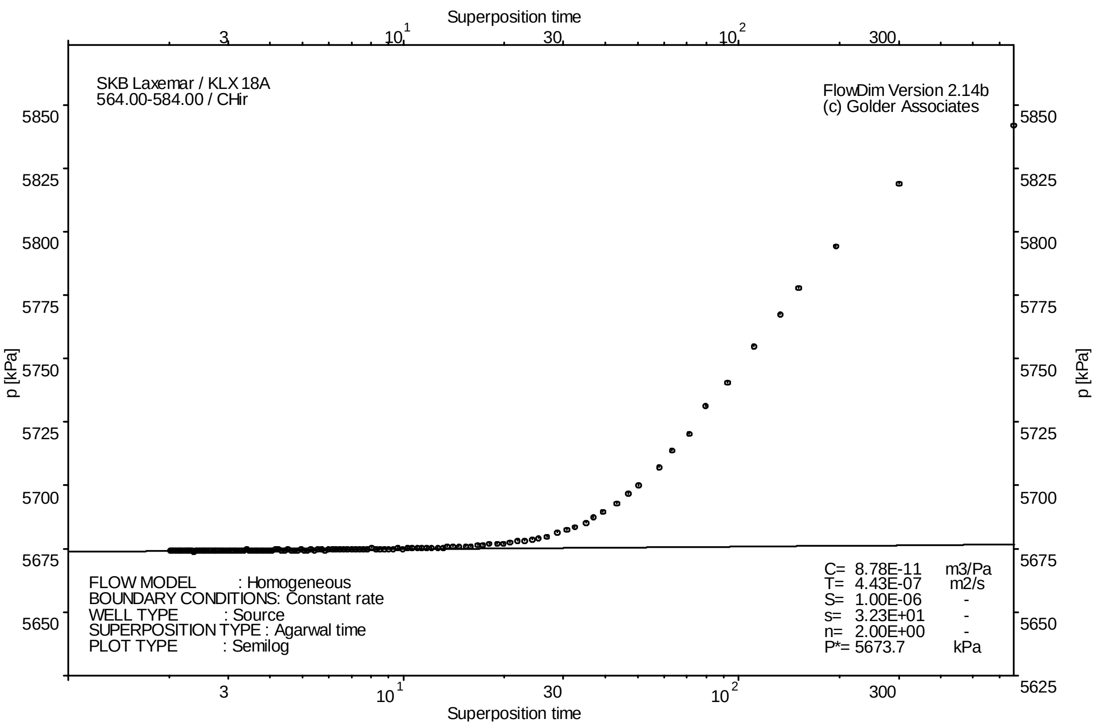
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

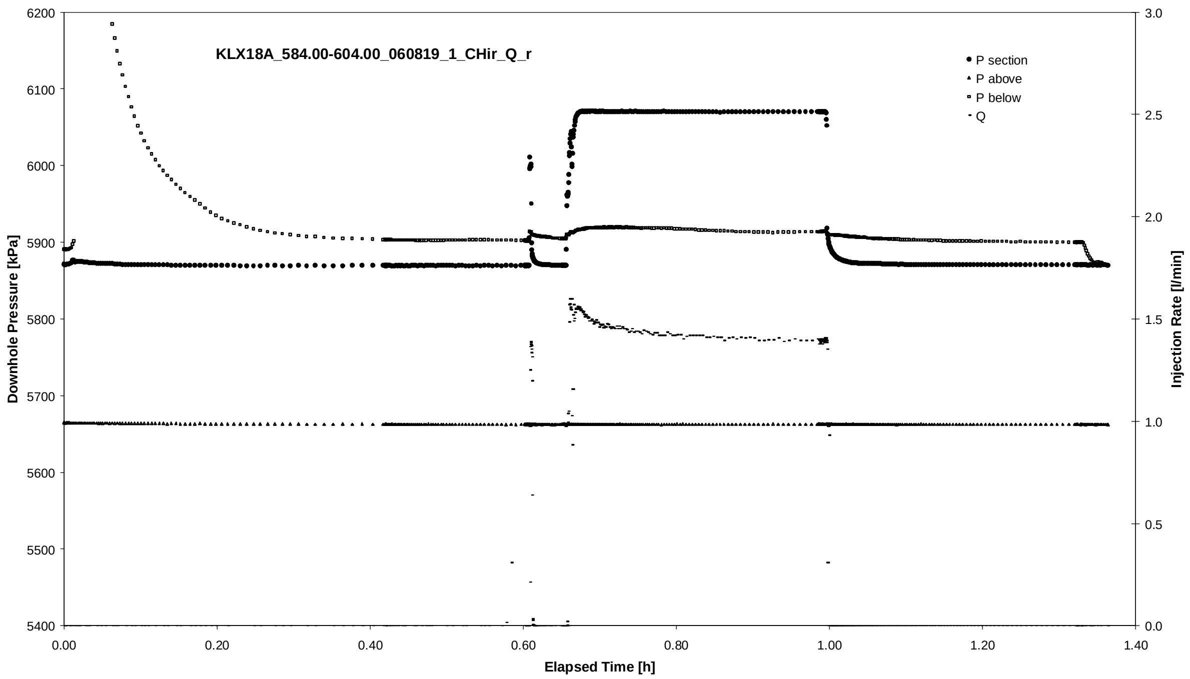


CHIR phase; HORNER match

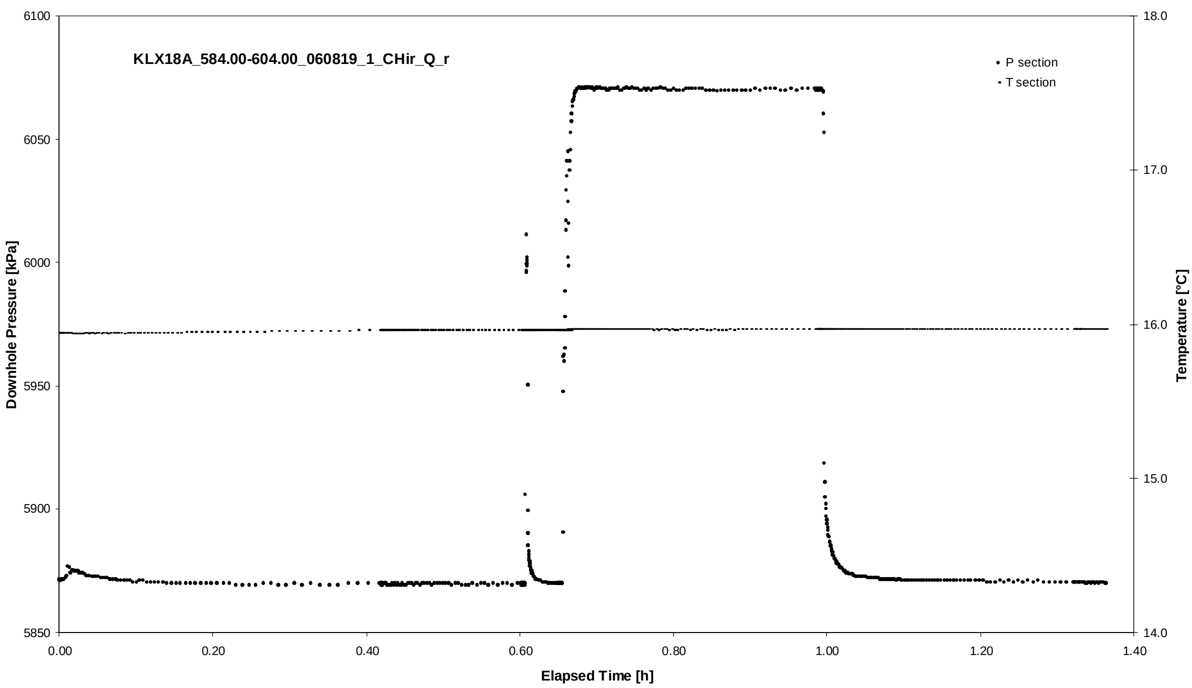
APPENDIX 2-30

Test 584.00 – 604.00 m

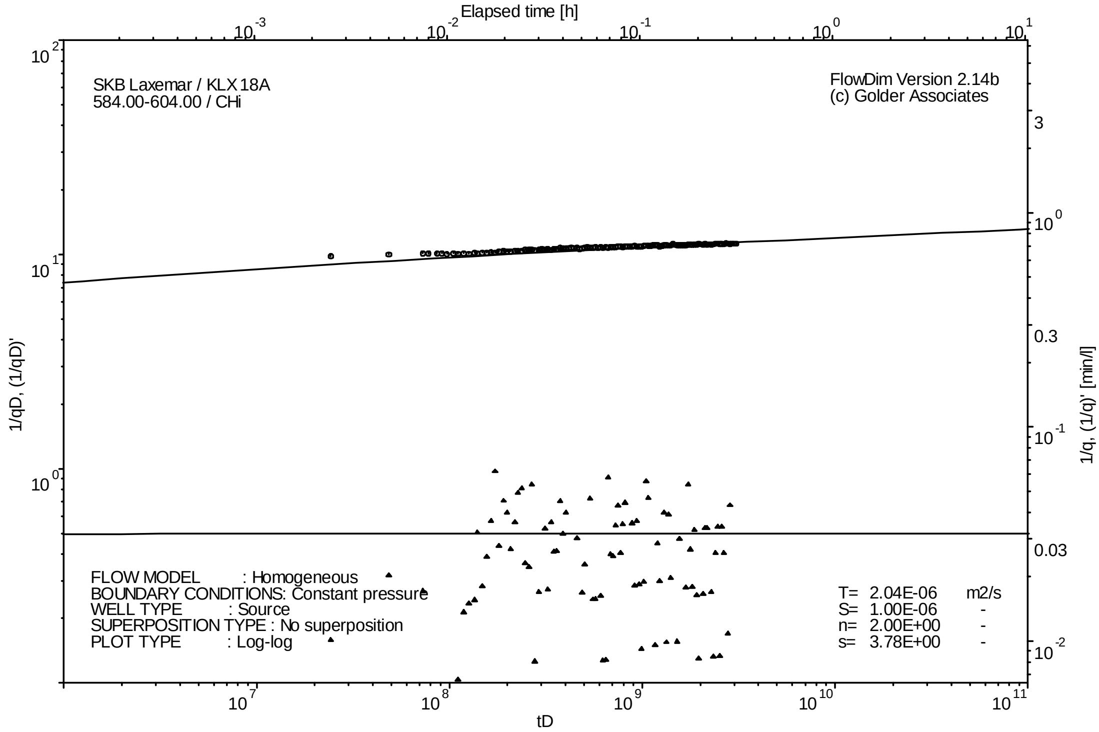
Analysis diagrams



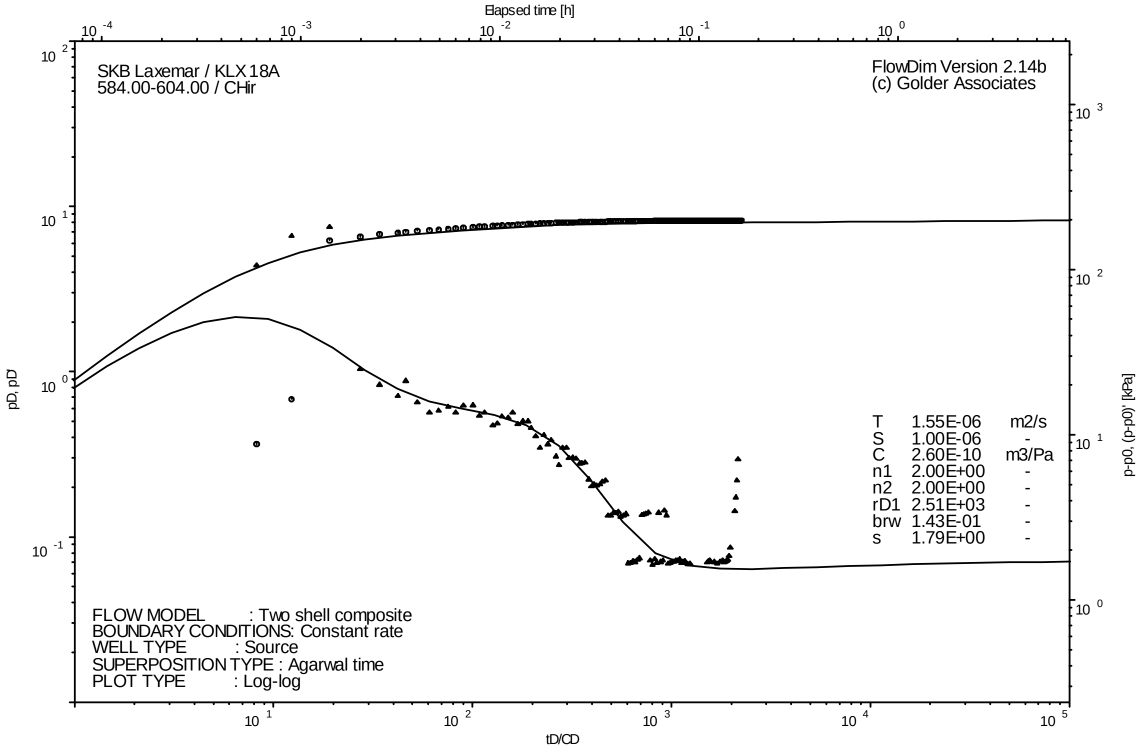
Pressure and flow rate vs. time; cartesian plot



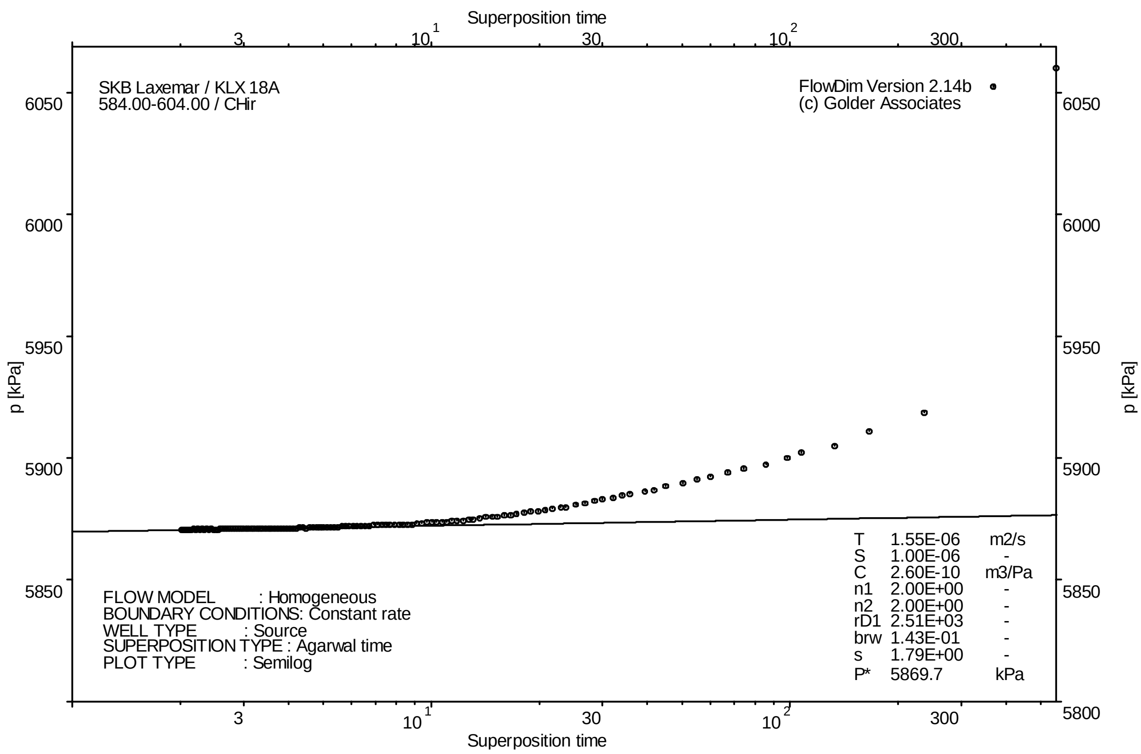
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

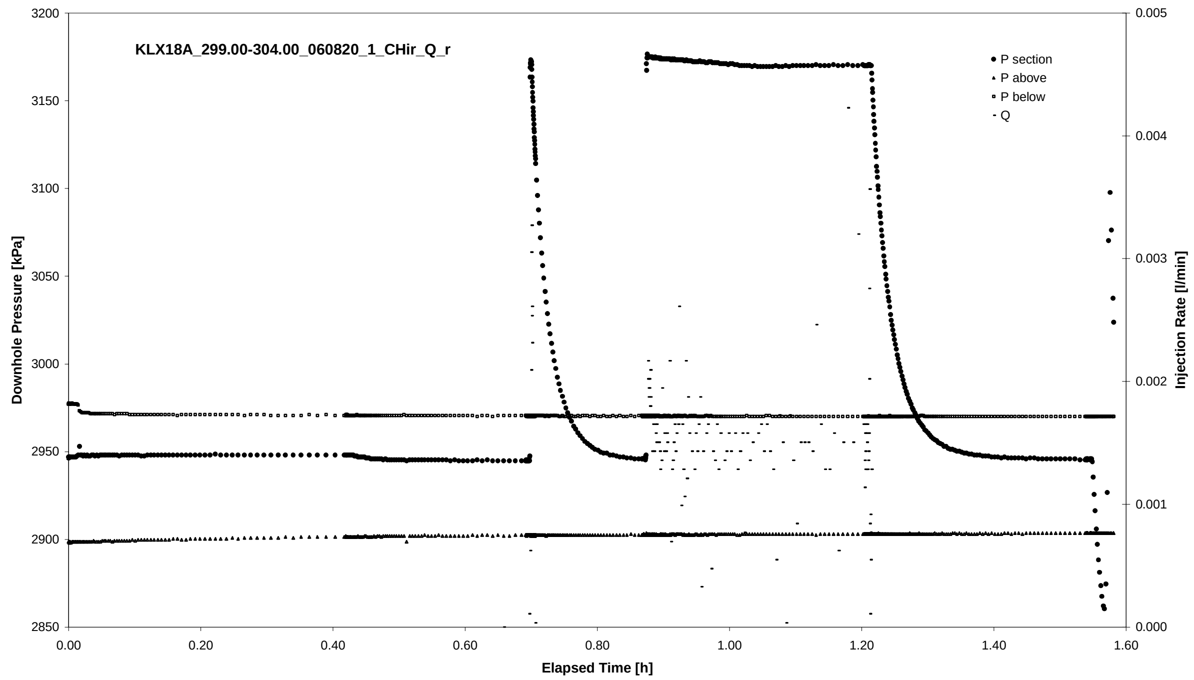


CHIR phase; HORNER match

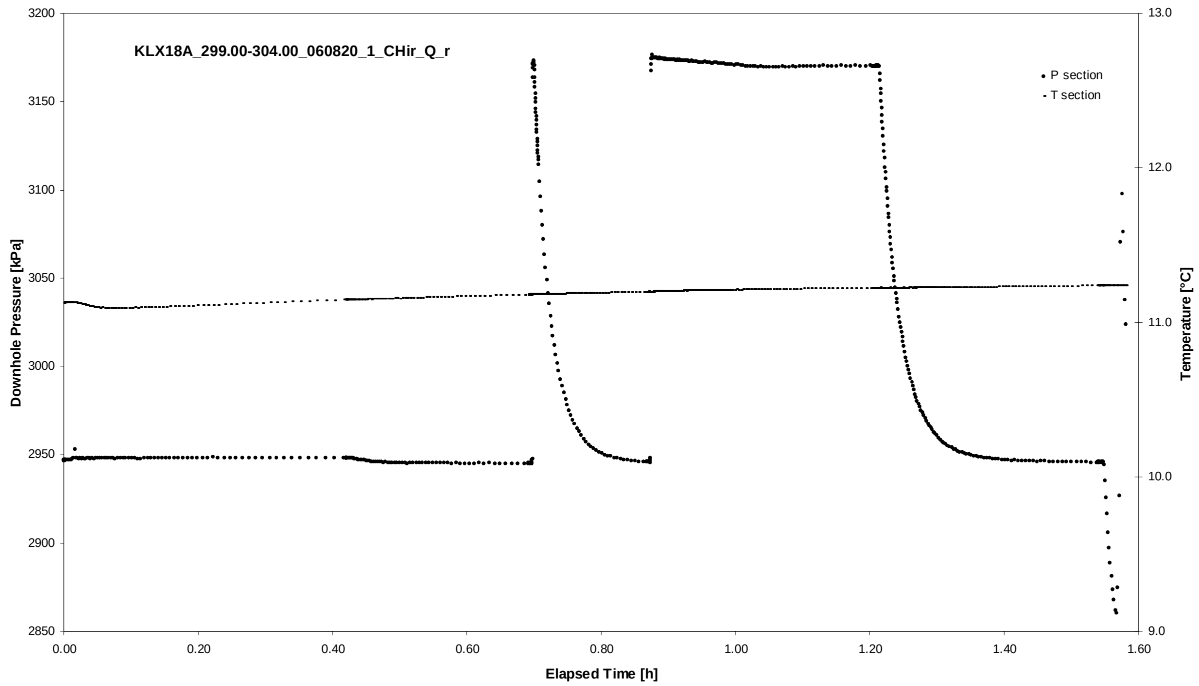
APPENDIX 2-31

Test 299.00 – 304.00 m

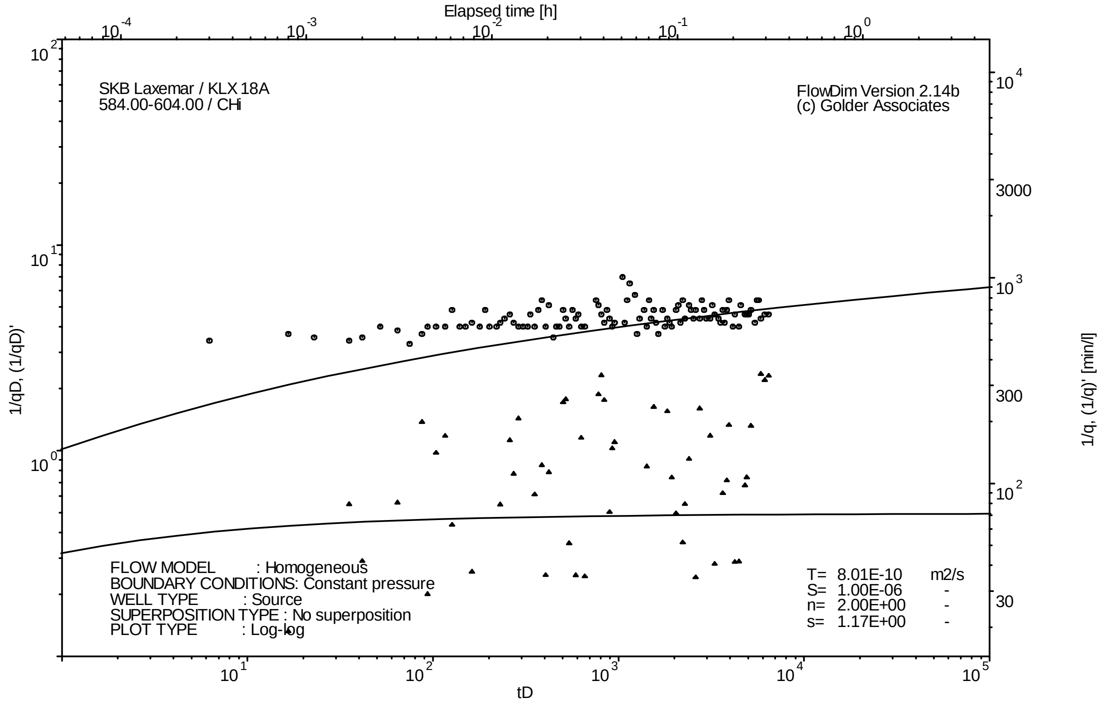
Analysis diagrams



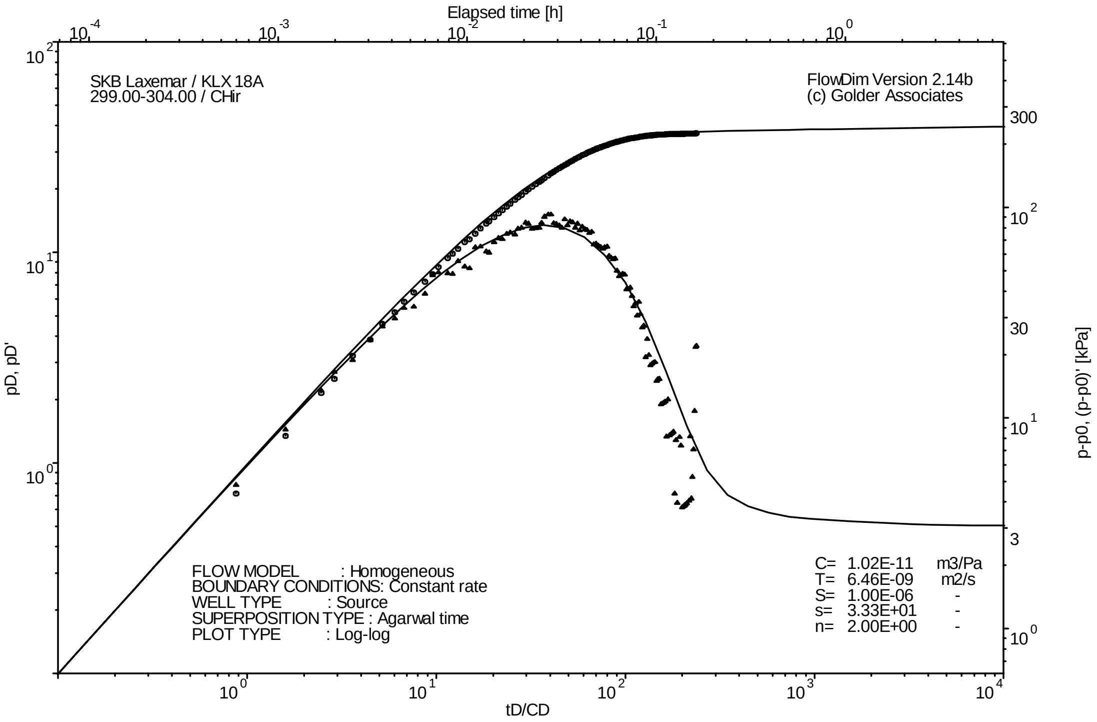
Pressure and flow rate vs. time; cartesian plot



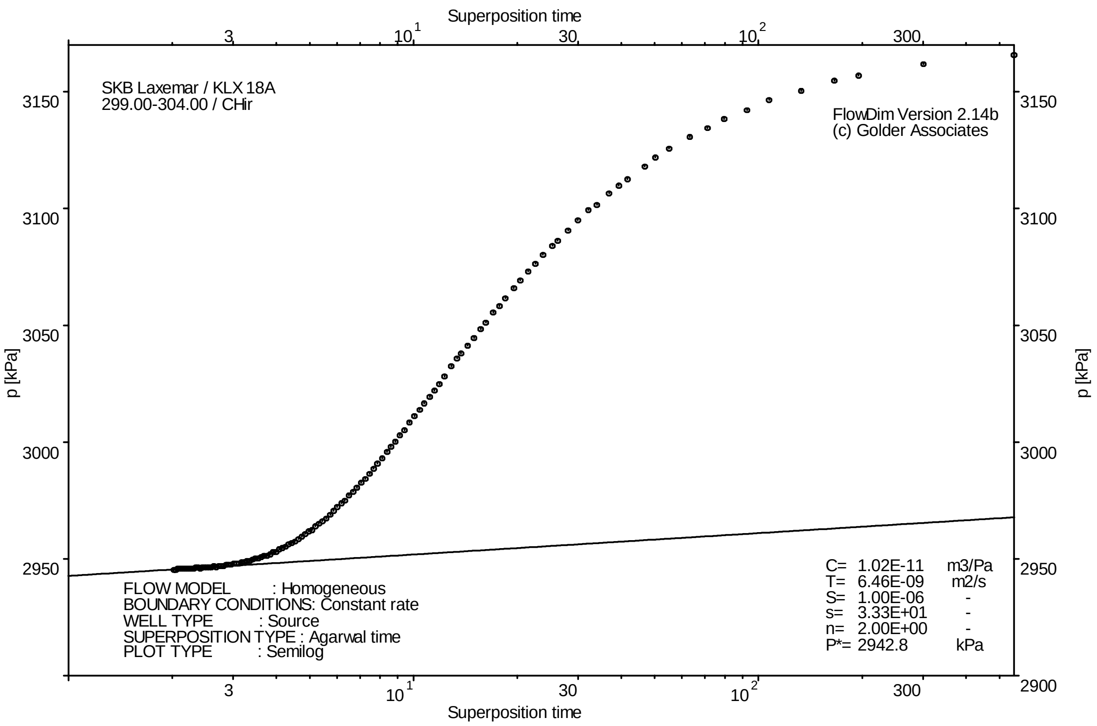
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

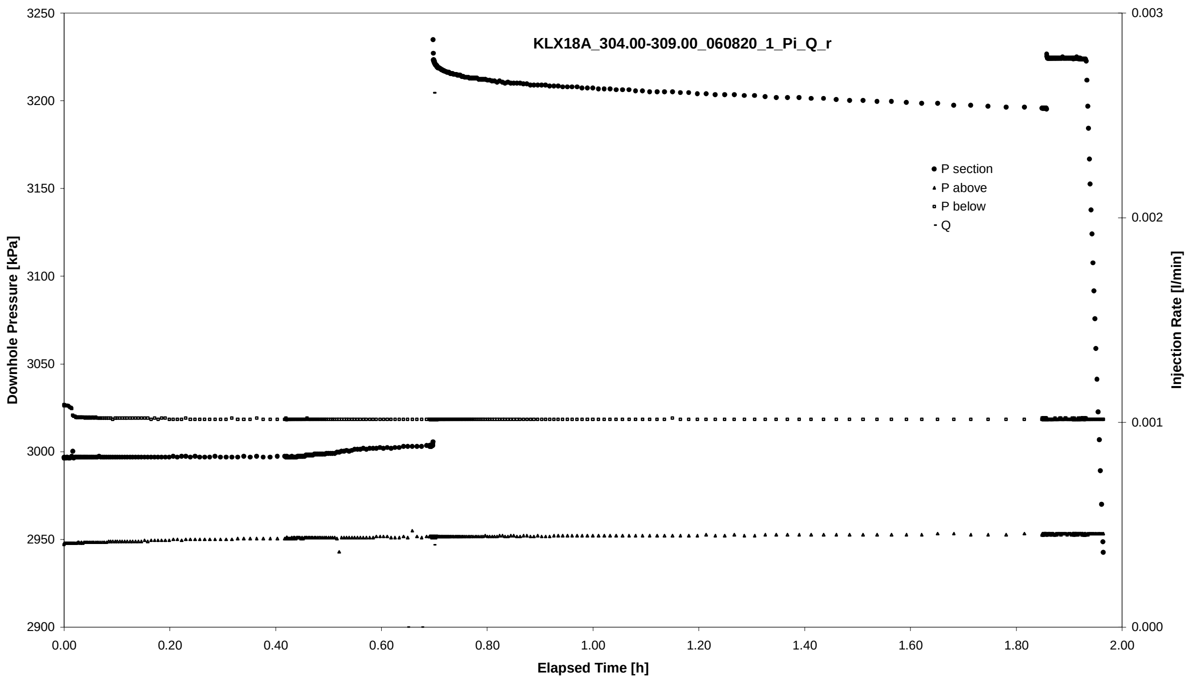


CHIR phase; HORNER match

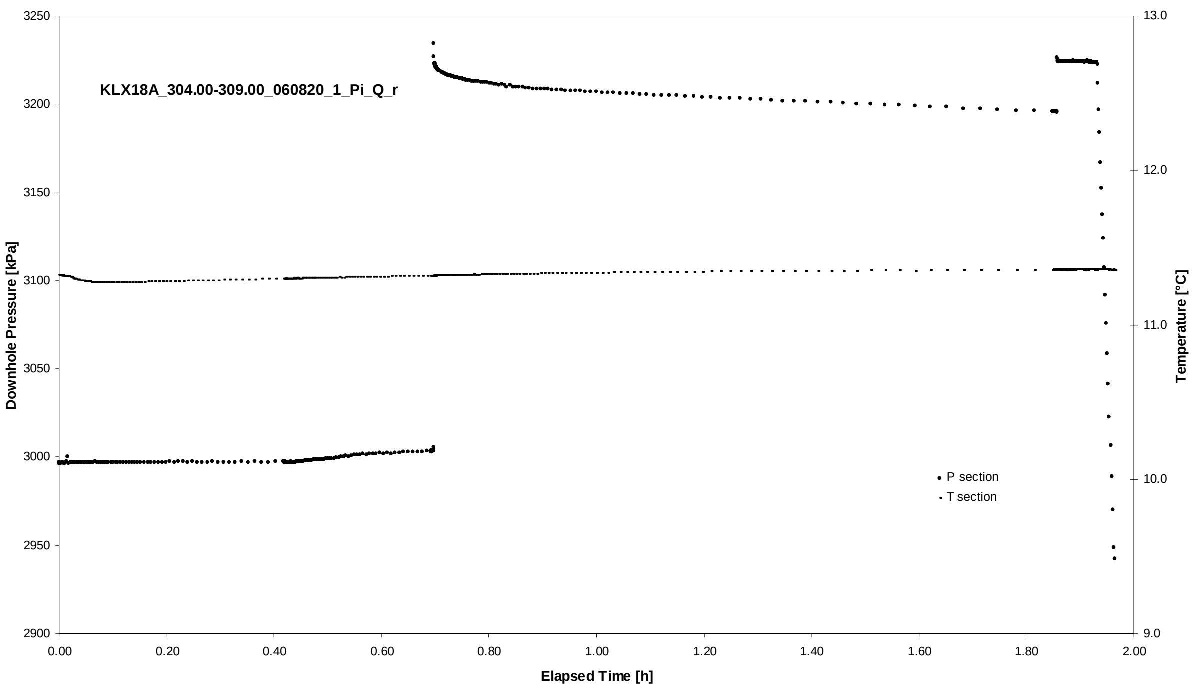
APPENDIX 2-32

Test 304.00 – 309.00 m

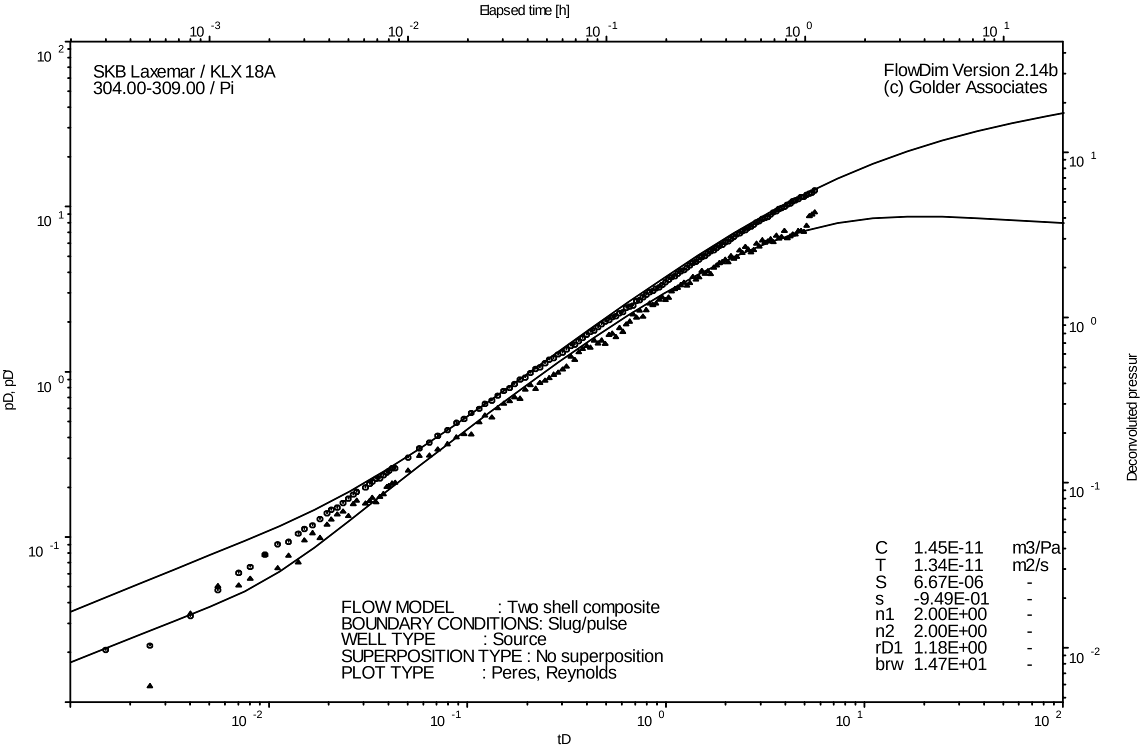
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

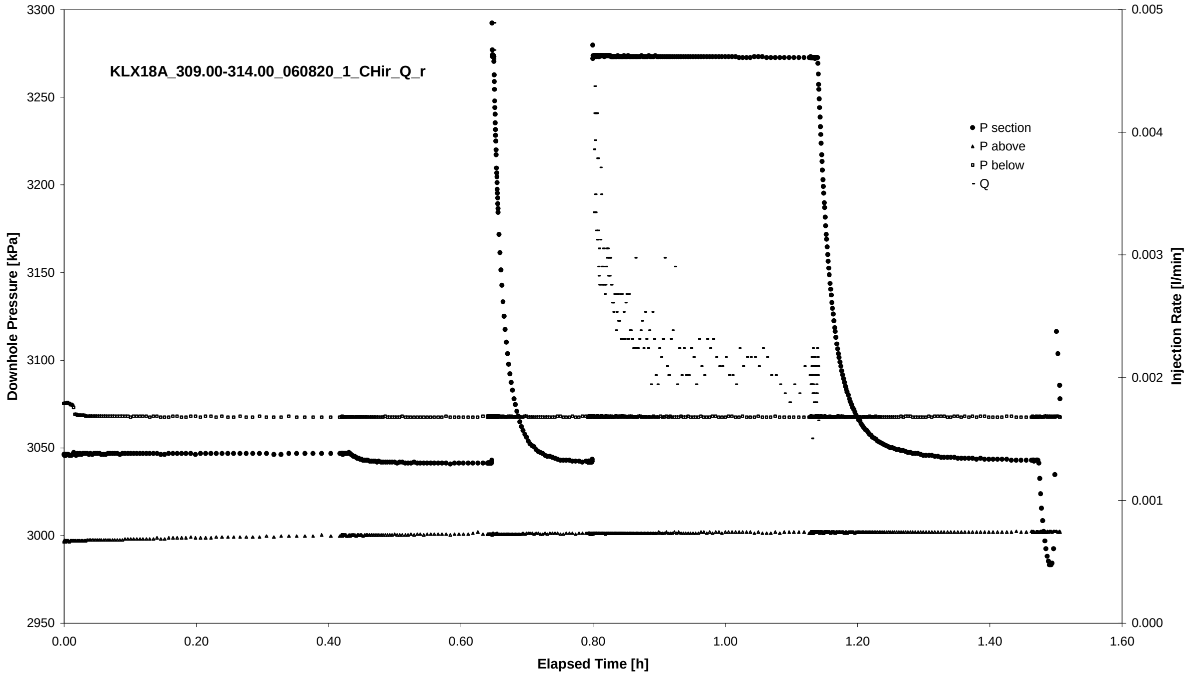


Pulse injection; deconvolution match

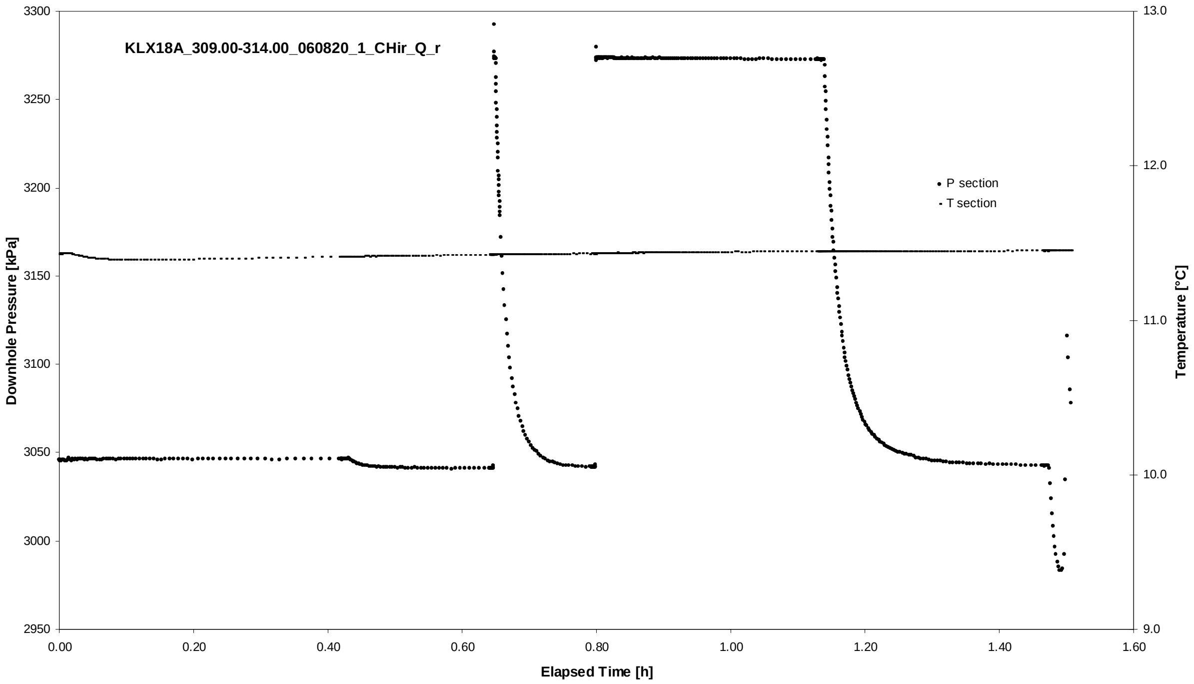
APPENDIX 2-33

Test 309.00 – 314.00 m

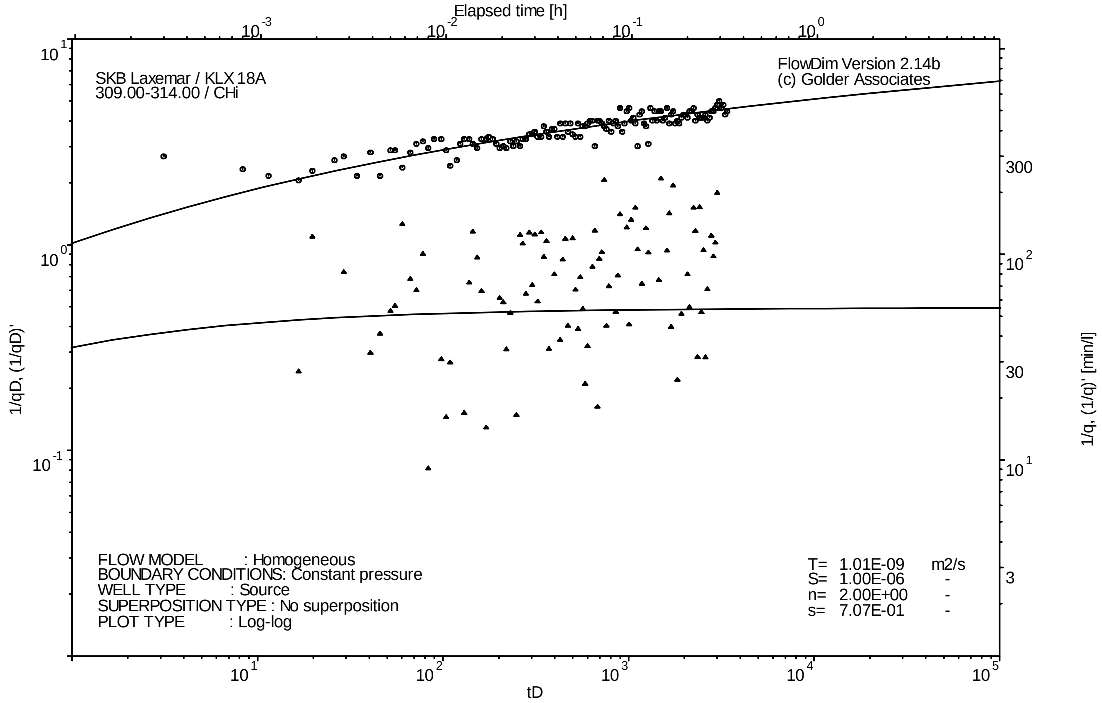
Analysis diagrams



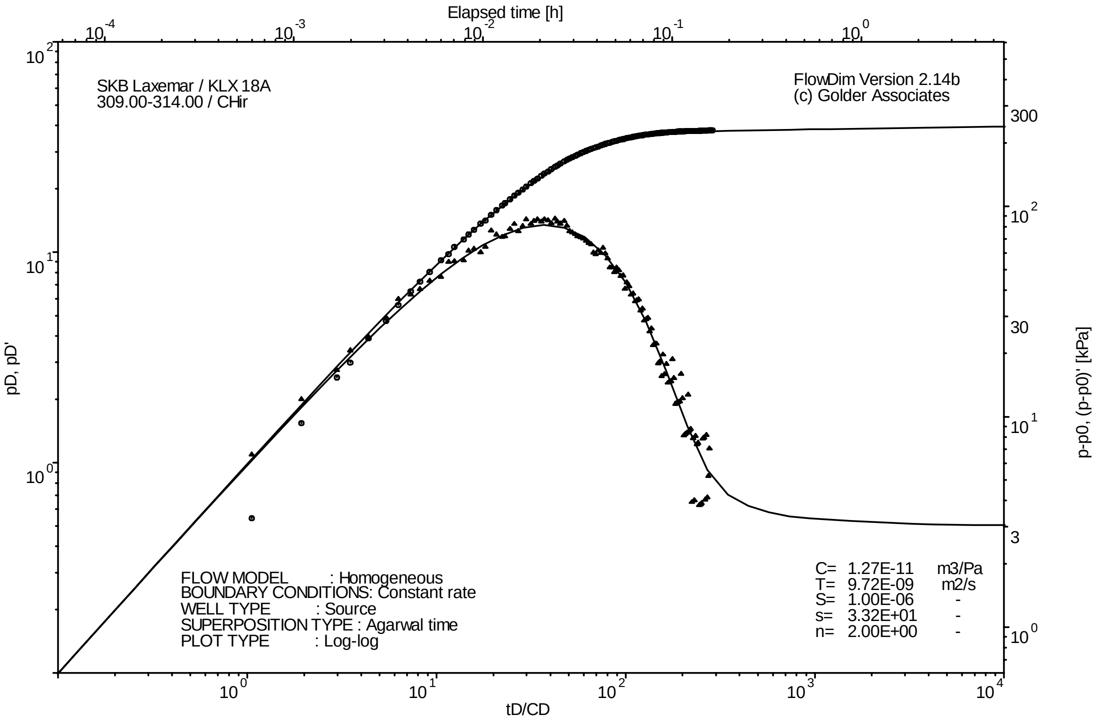
Pressure and flow rate vs. time; cartesian plot



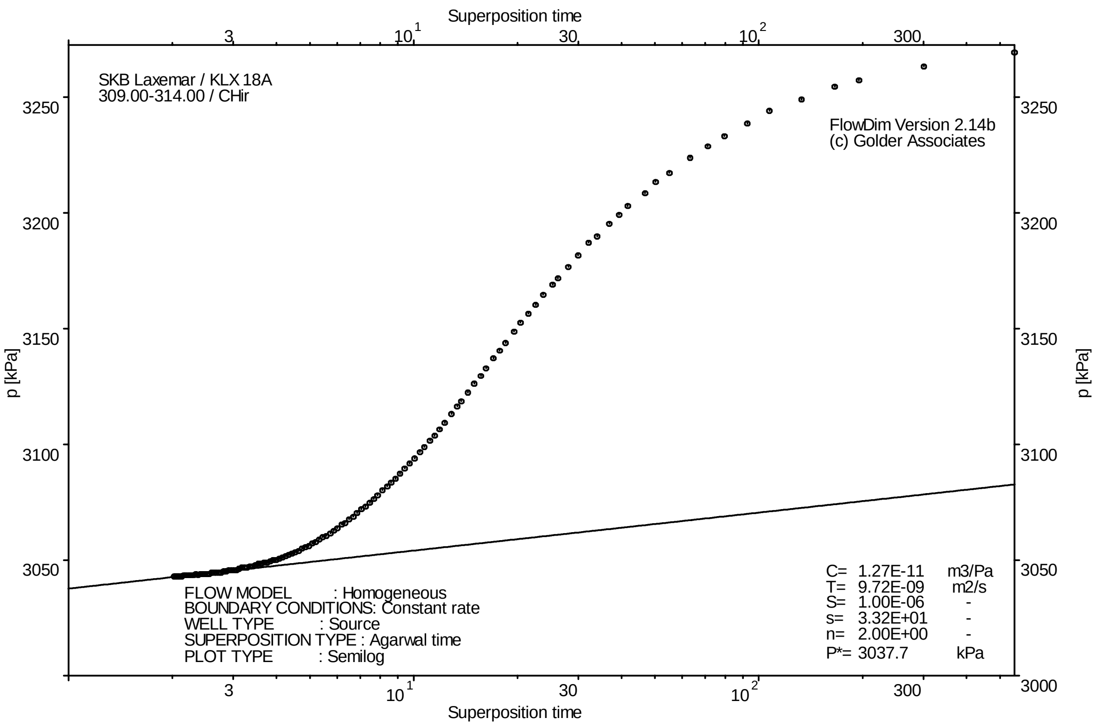
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

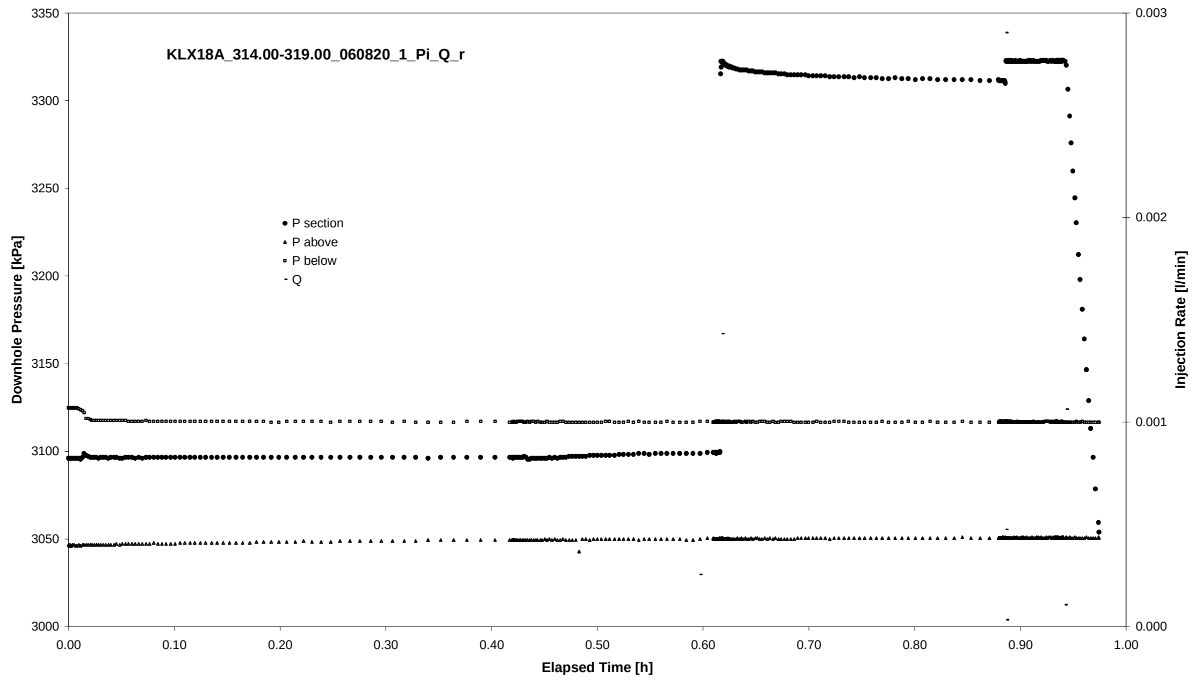


CHIR phase; HORNER match

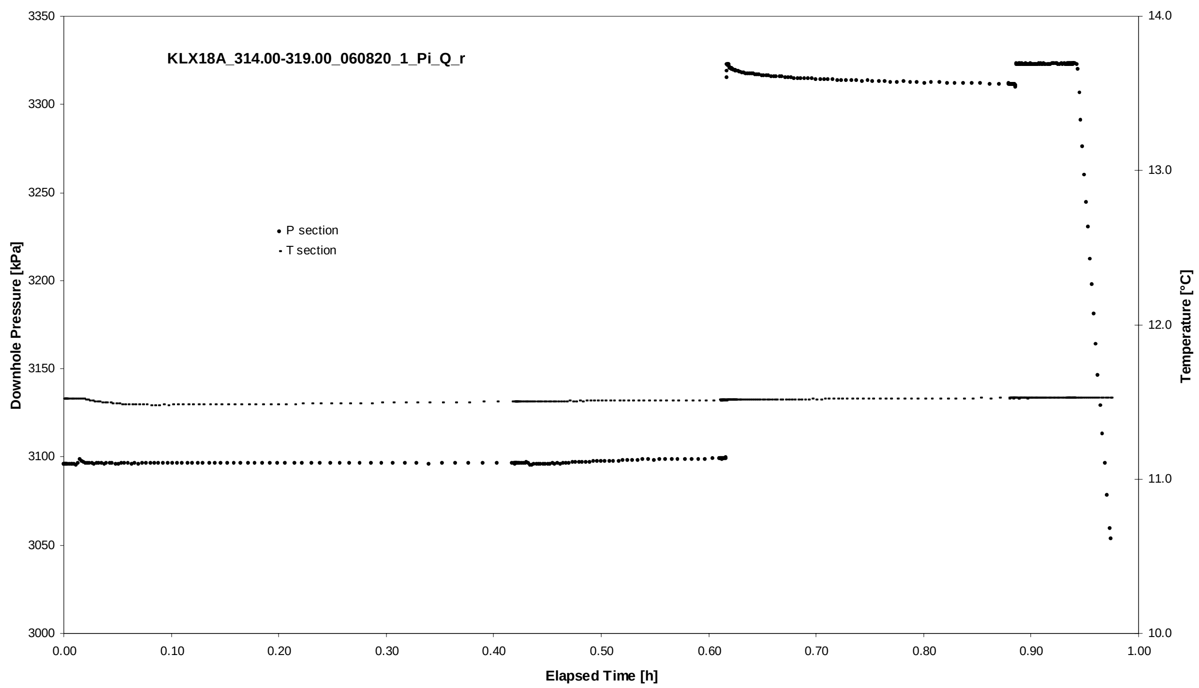
APPENDIX 2-34

Test 314.00 – 319.00 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

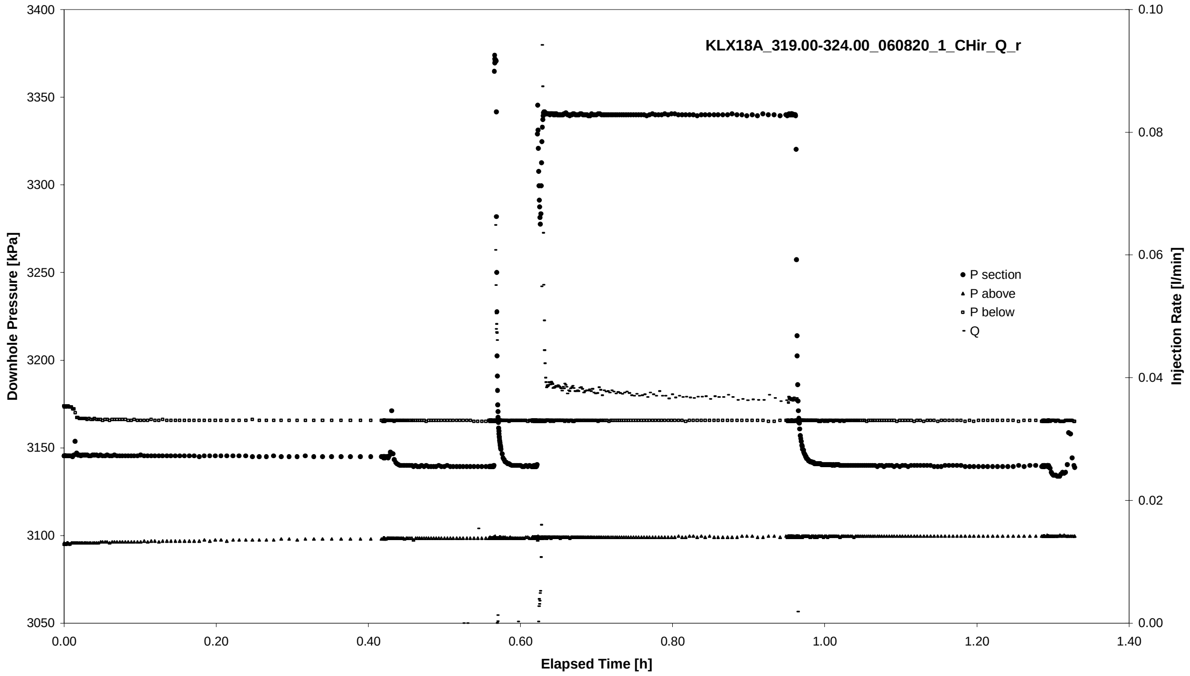
Not Analysed

CHIR phase; HORNER match

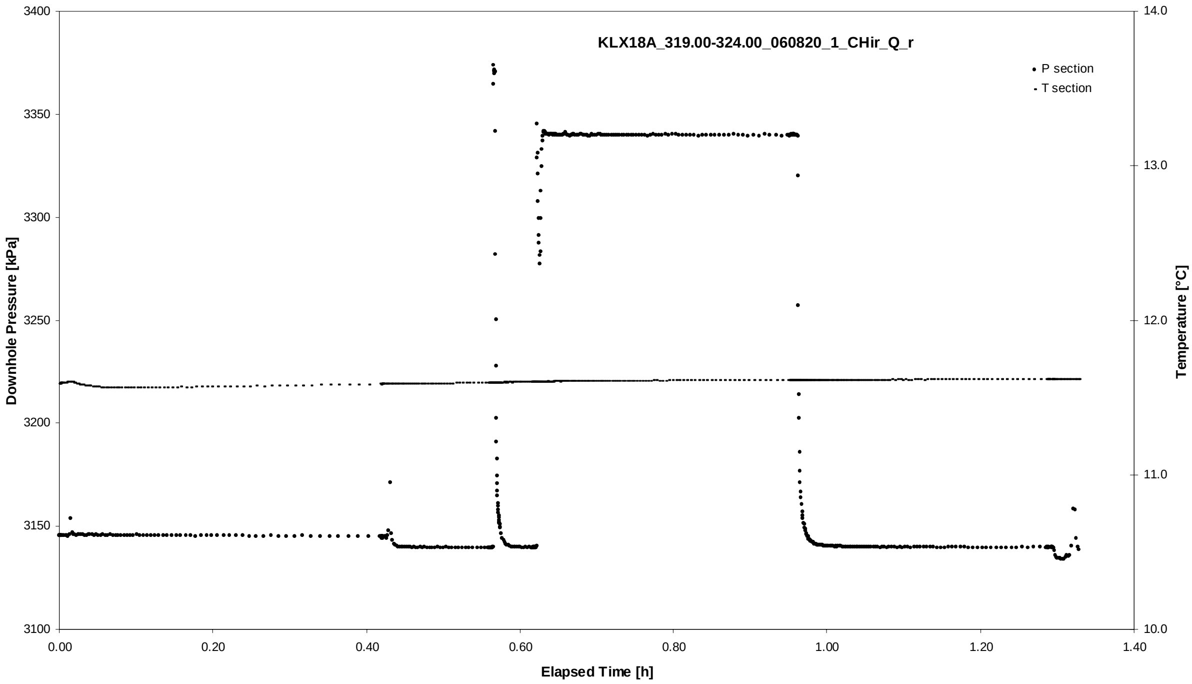
APPENDIX 2-35

Test 319.00 – 324.00 m

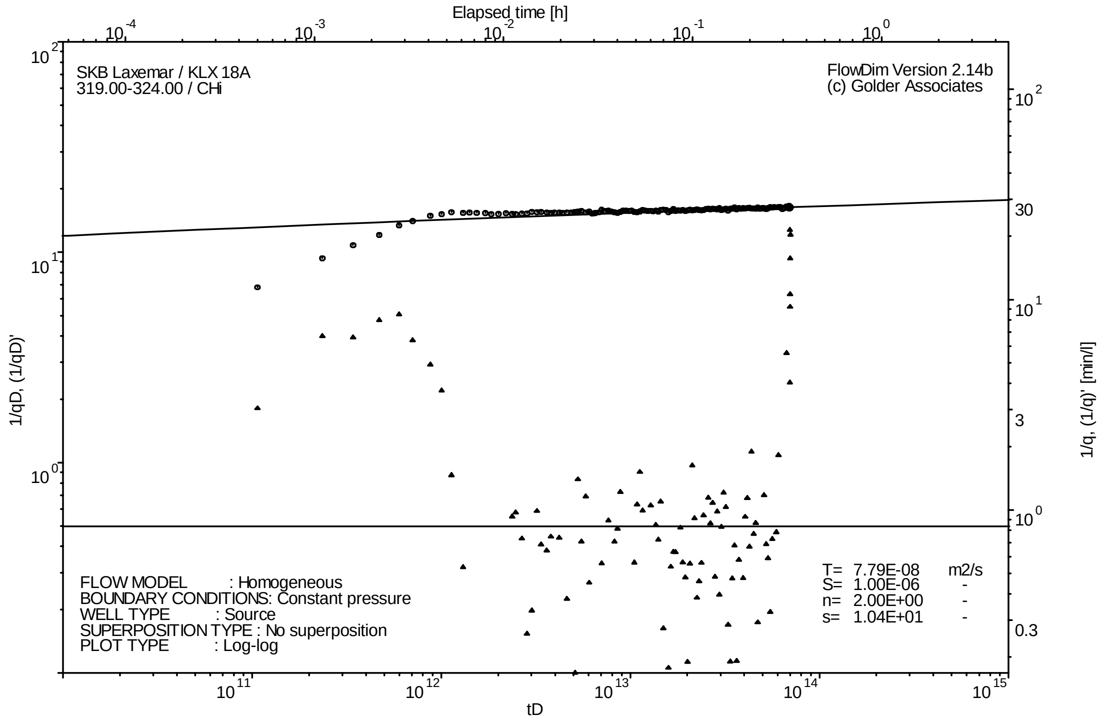
Analysis diagrams



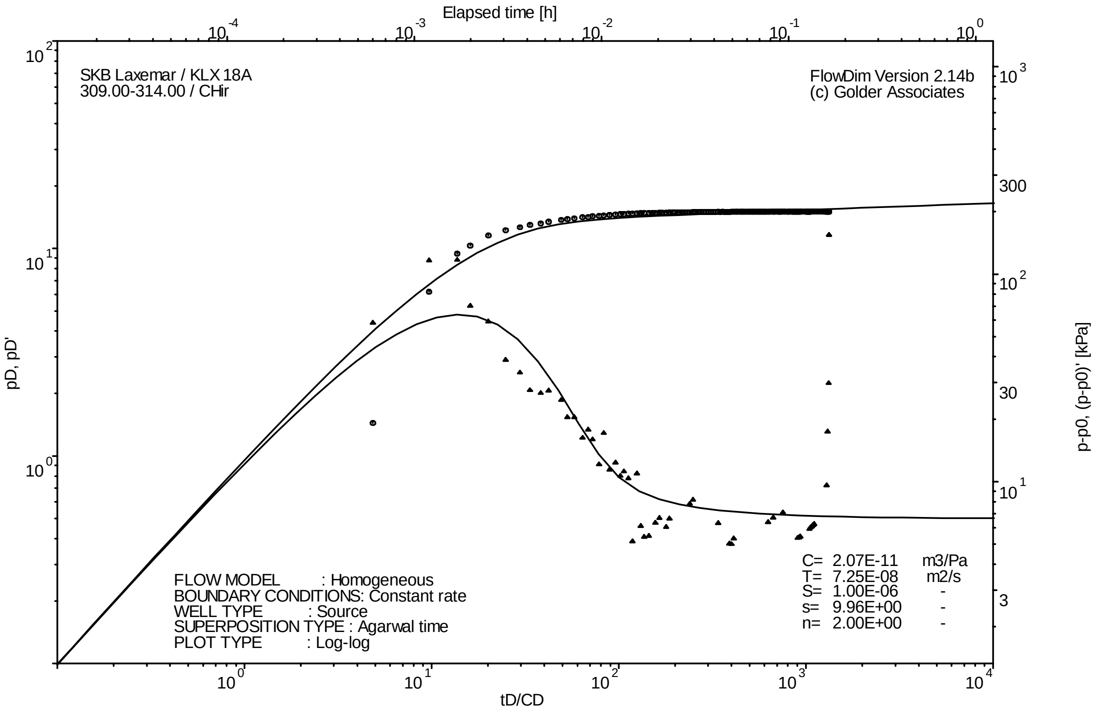
Pressure and flow rate vs. time; cartesian plot



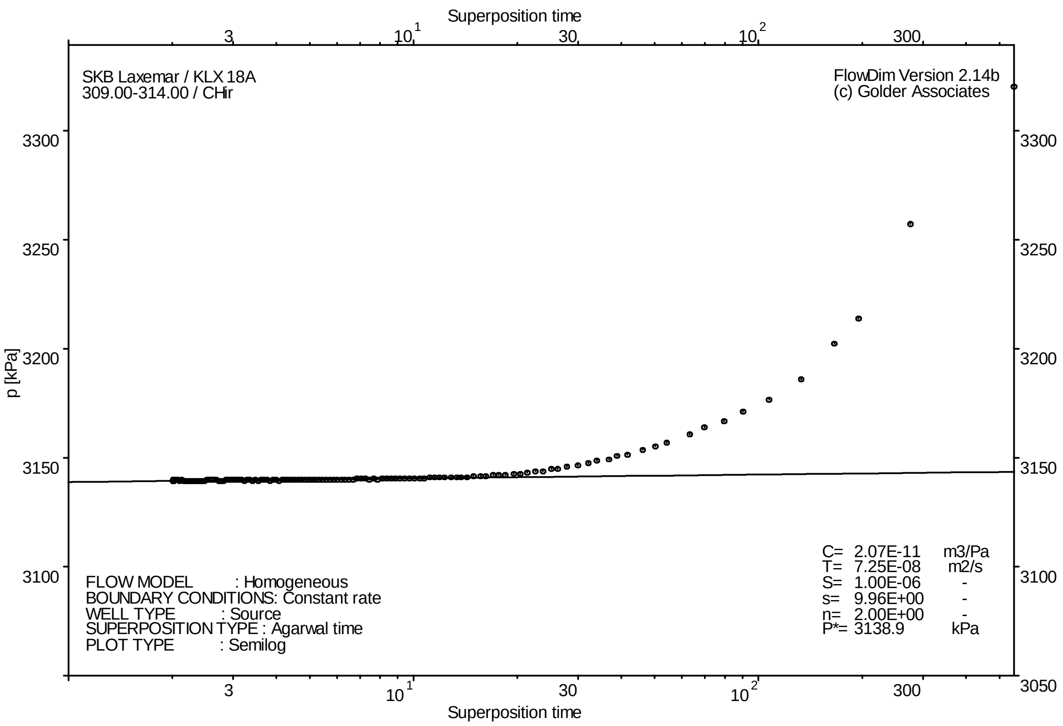
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

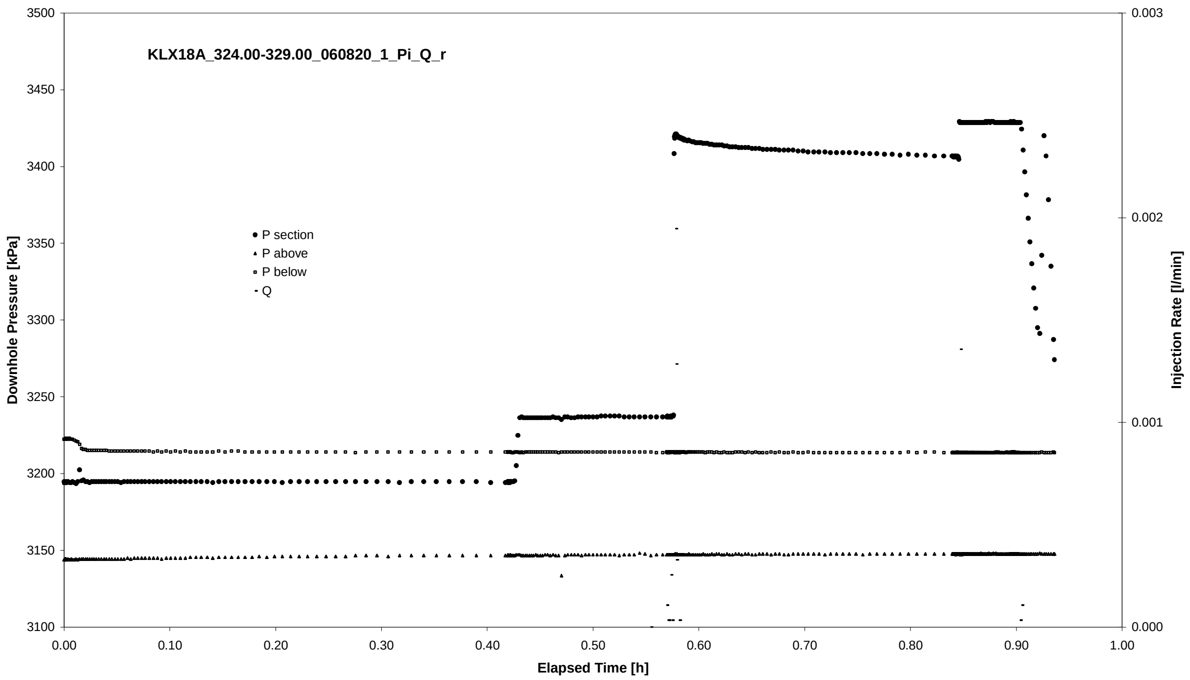


CHIR phase; HORNER match

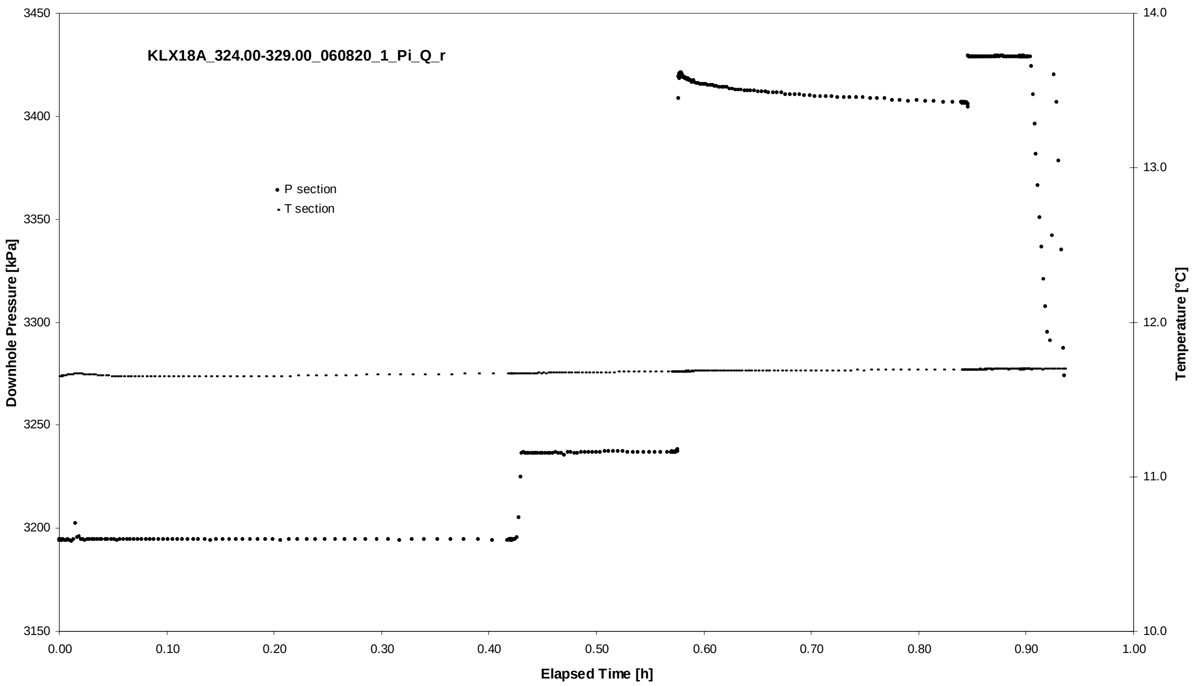
APPENDIX 2-36

Test 324.00 – 329.00 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

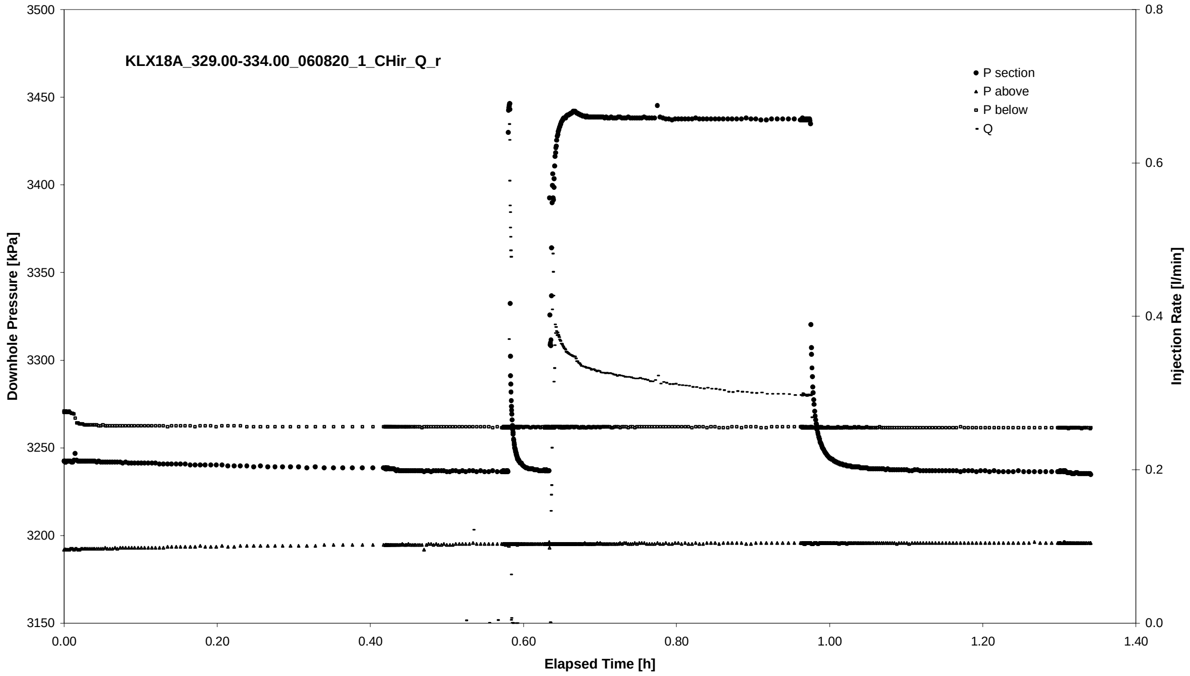
Not Analysed

CHIR phase; HORNER match

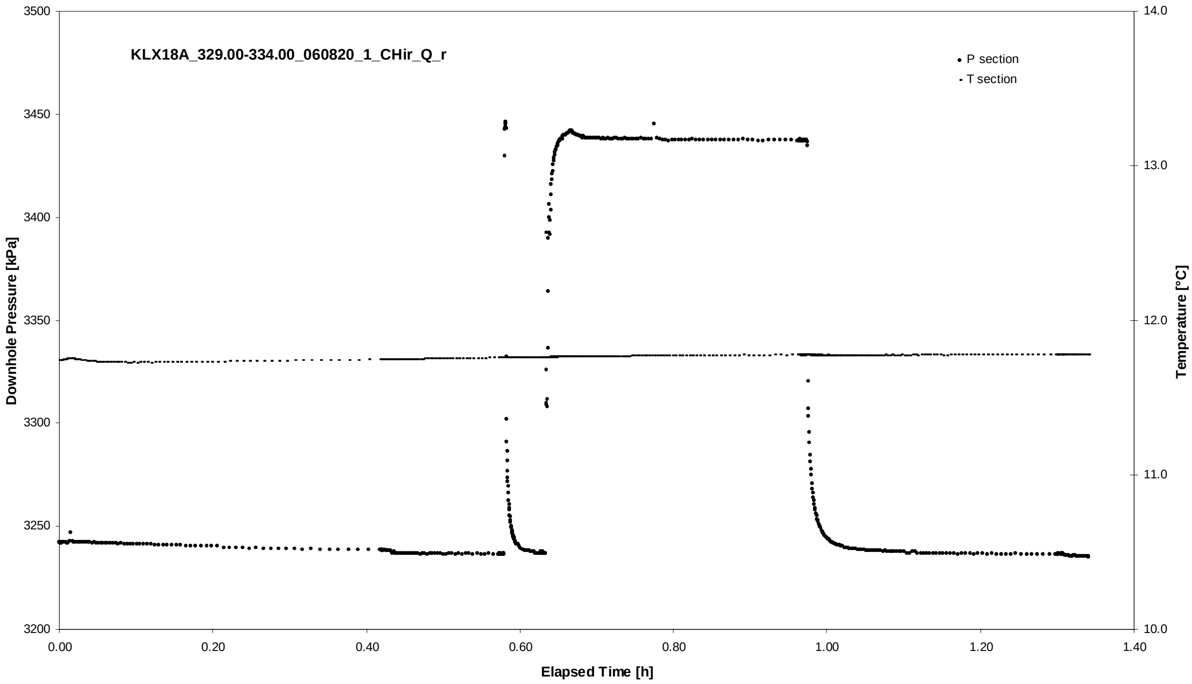
APPENDIX 2-37

Test 329.00 – 334.00 m

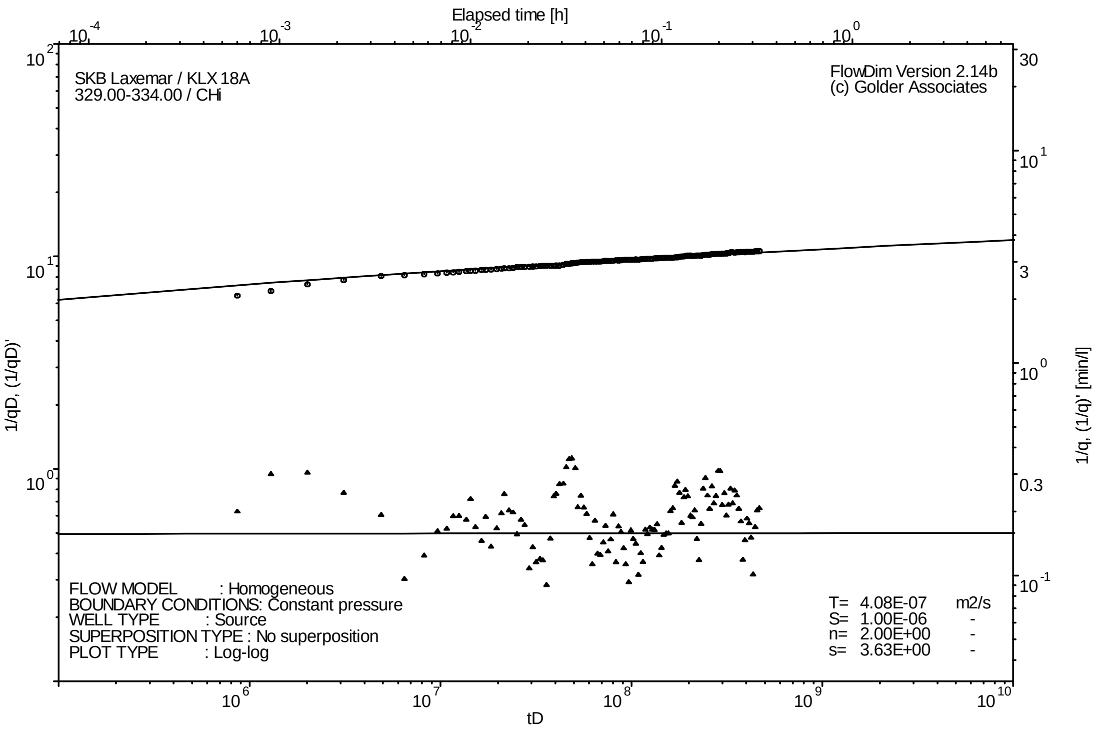
Analysis diagrams



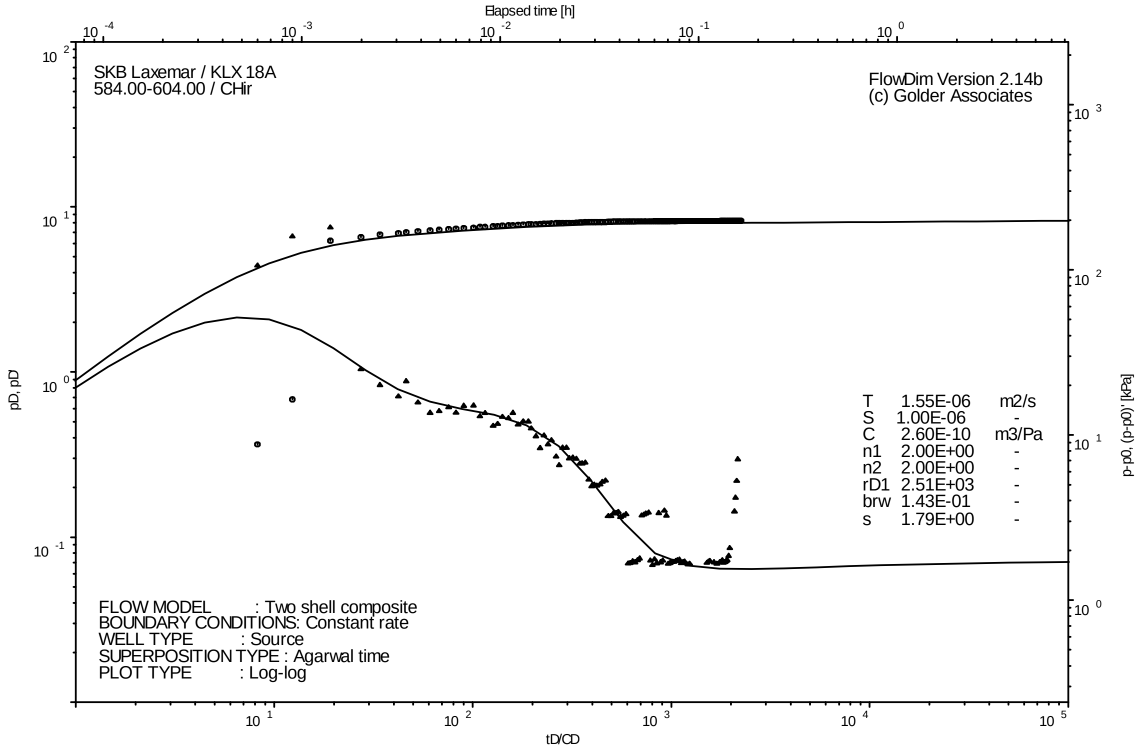
Pressure and flow rate vs. time; cartesian plot



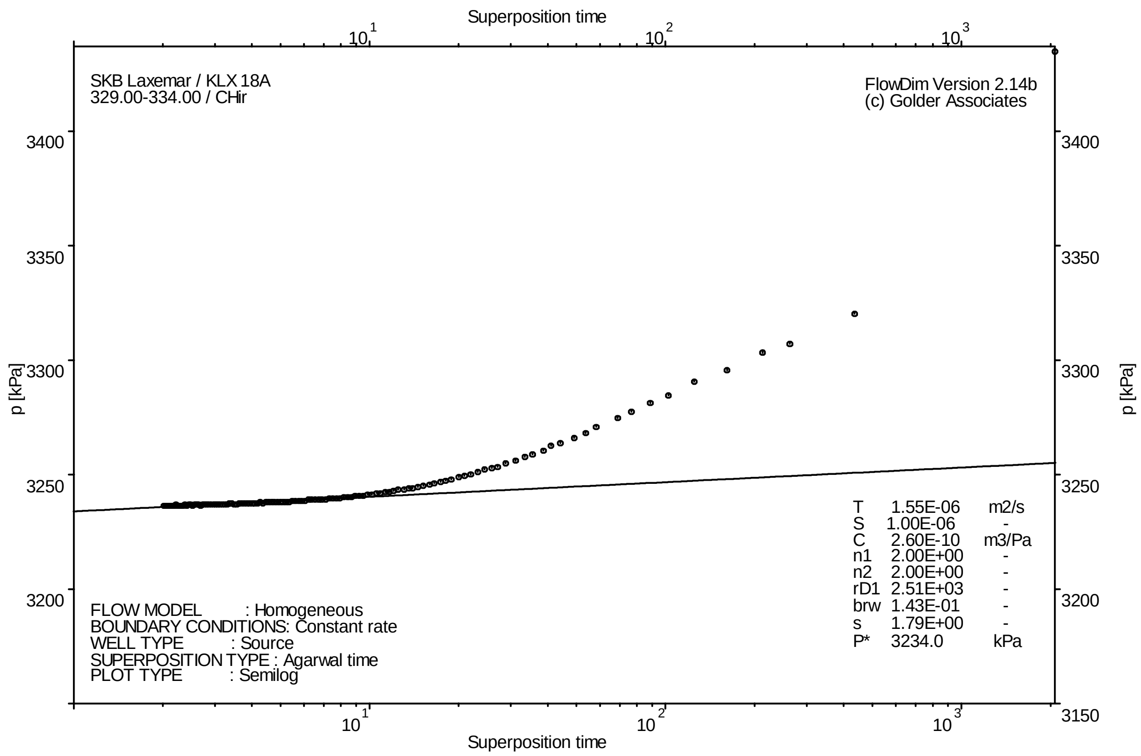
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

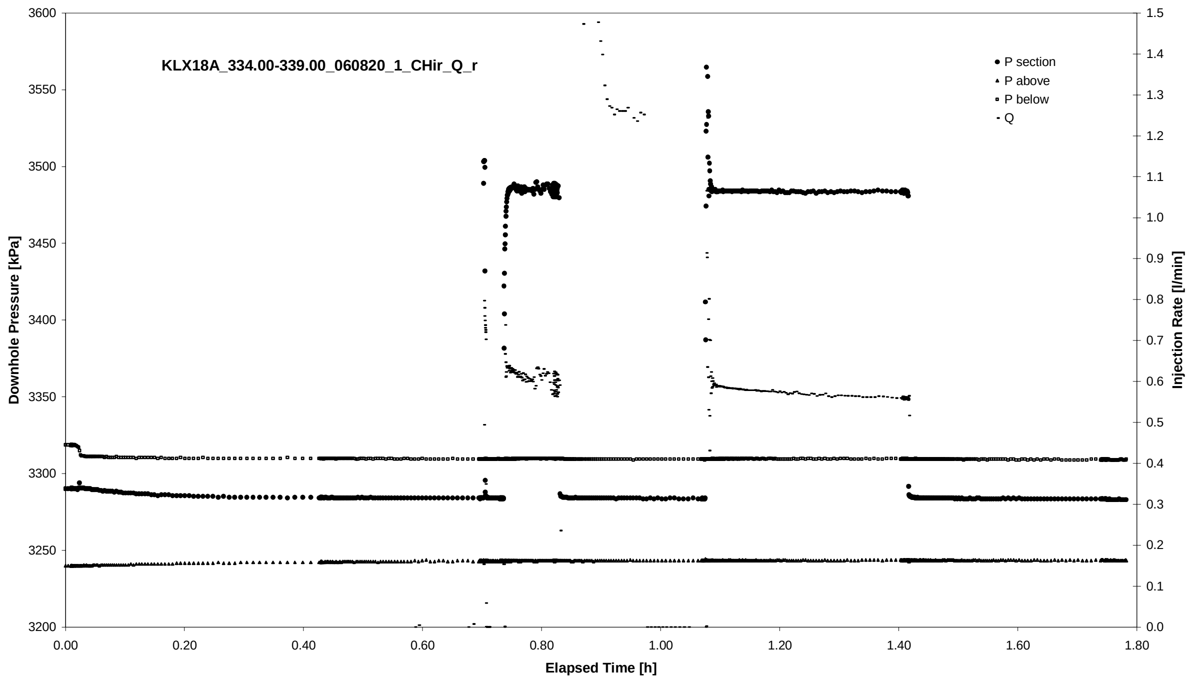


CHIR phase; HORNER match

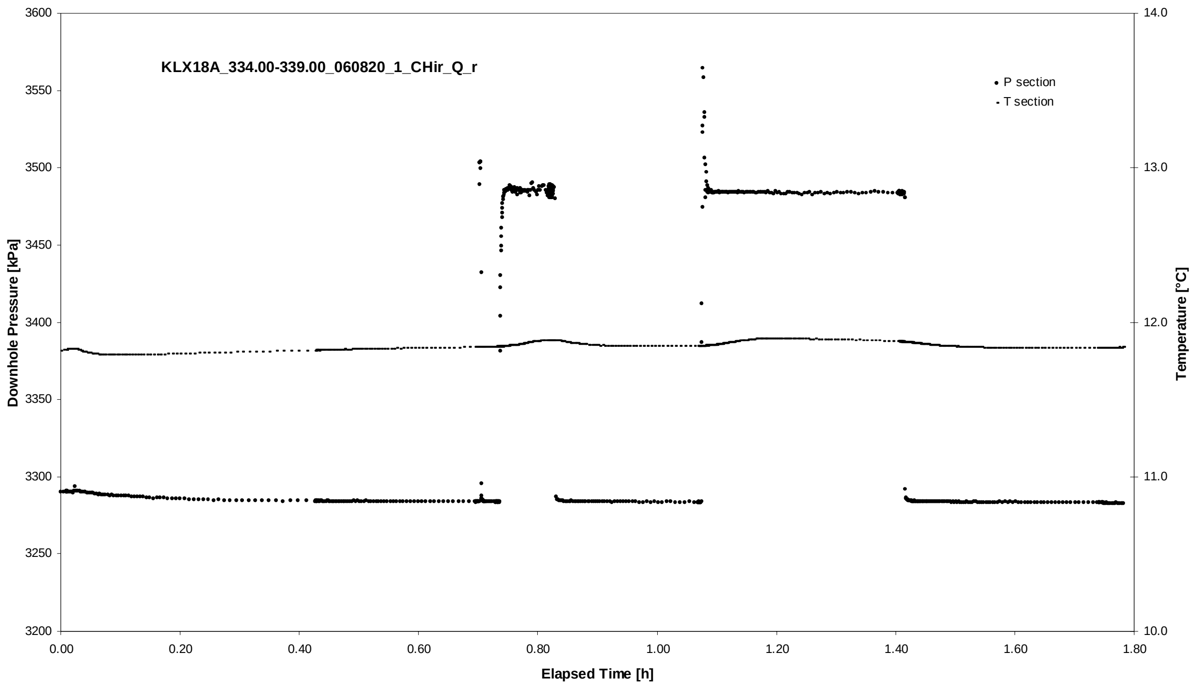
APPENDIX 2-38

Test 334.00 – 339.00 m

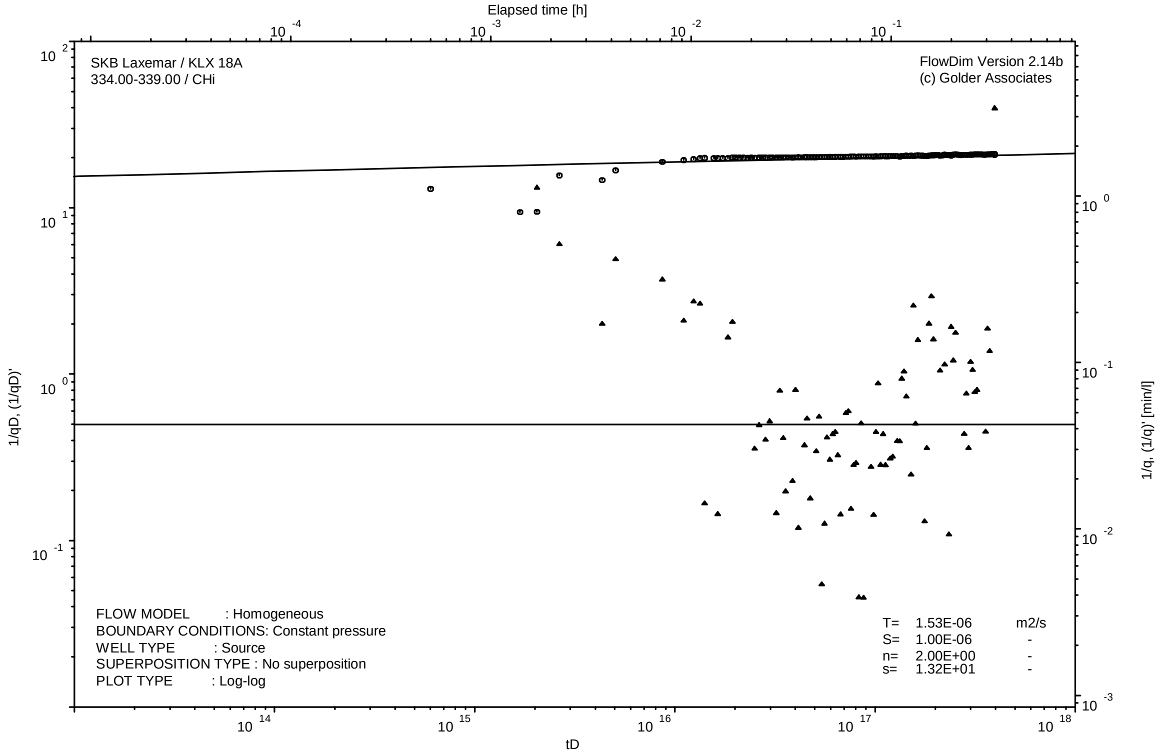
Analysis diagrams



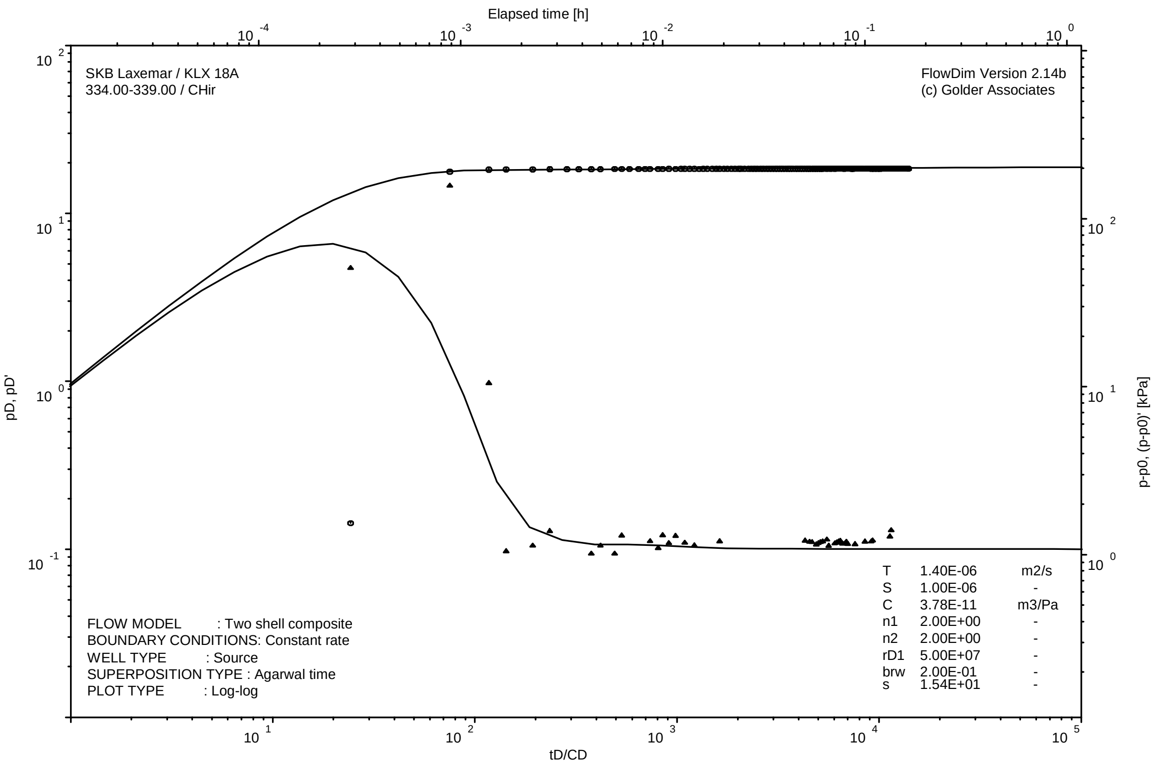
Pressure and flow rate vs. time; cartesian plot



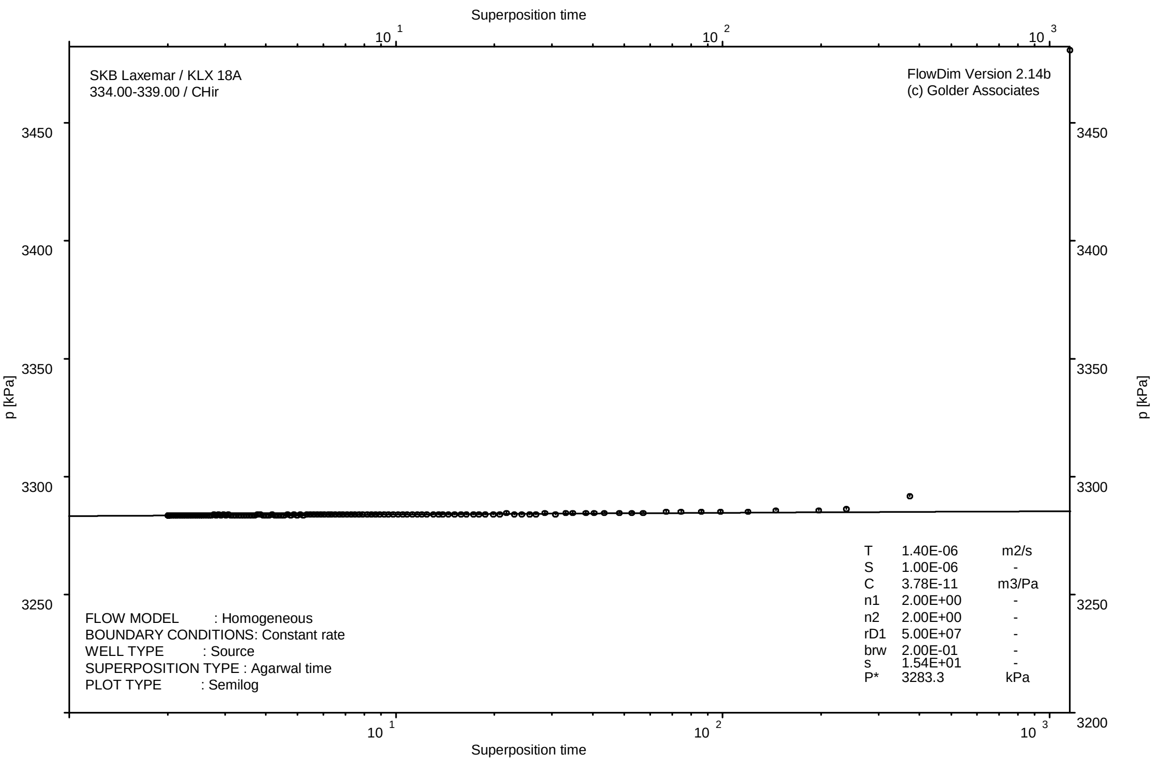
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

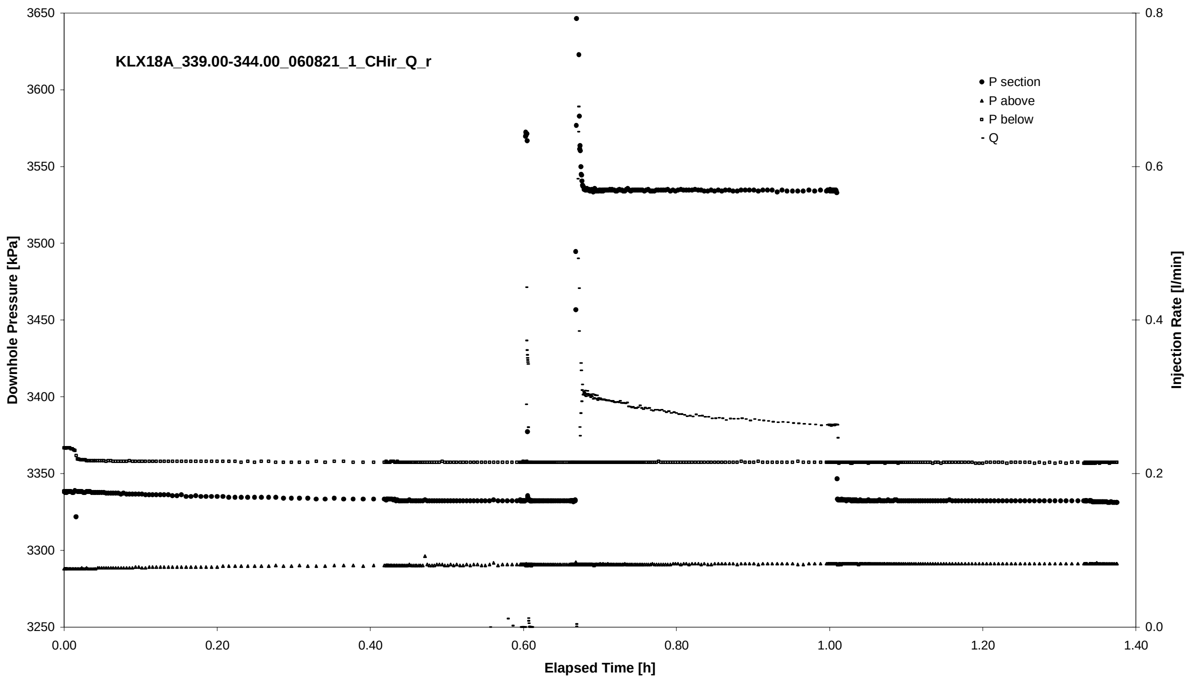


CHIR phase; HORNER match

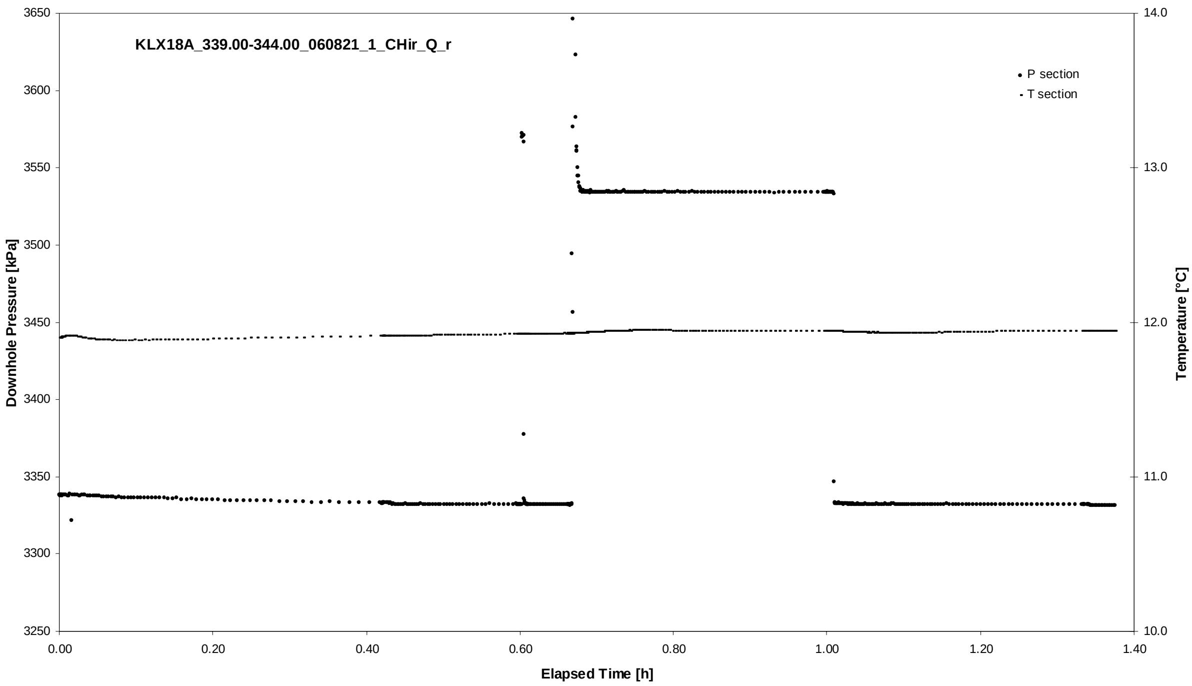
APPENDIX 2-39

Test 339.00 – 344.00 m

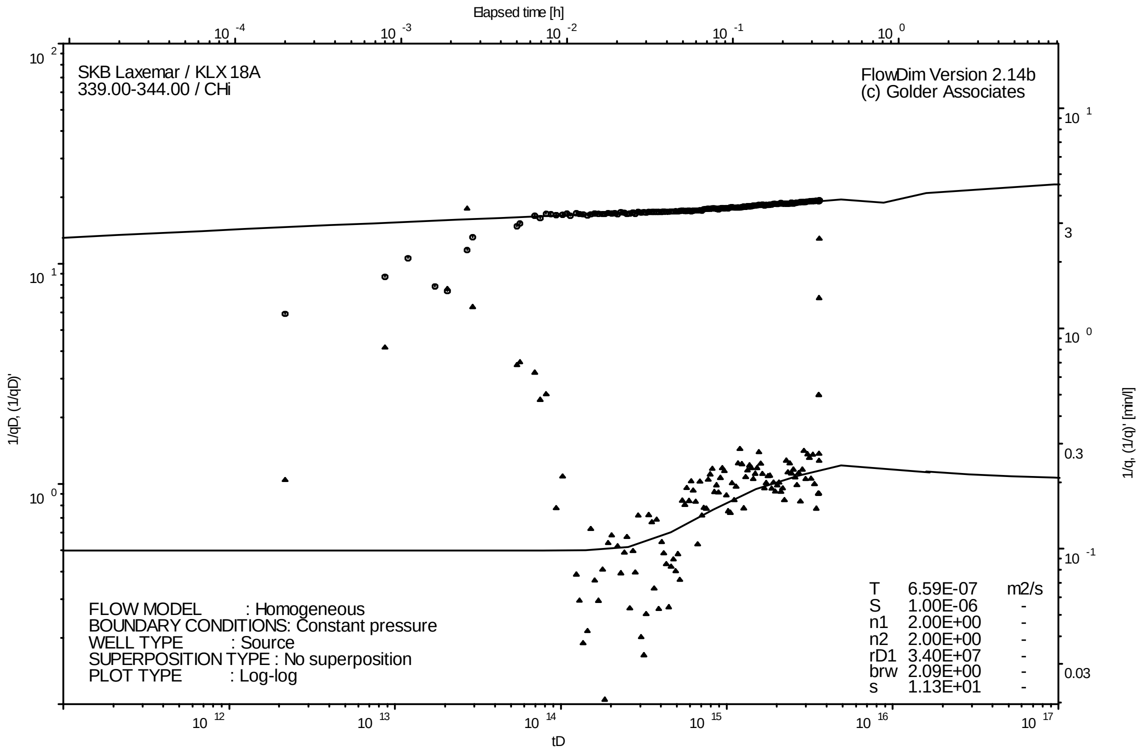
Analysis diagrams



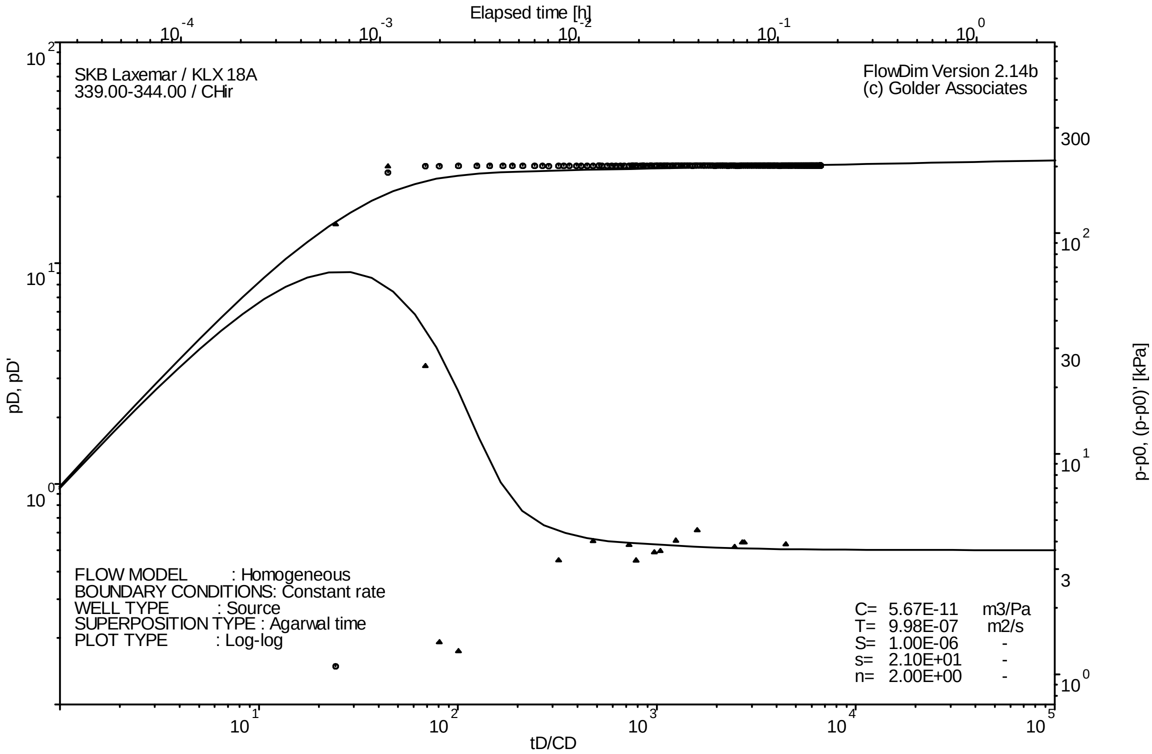
Pressure and flow rate vs. time; cartesian plot



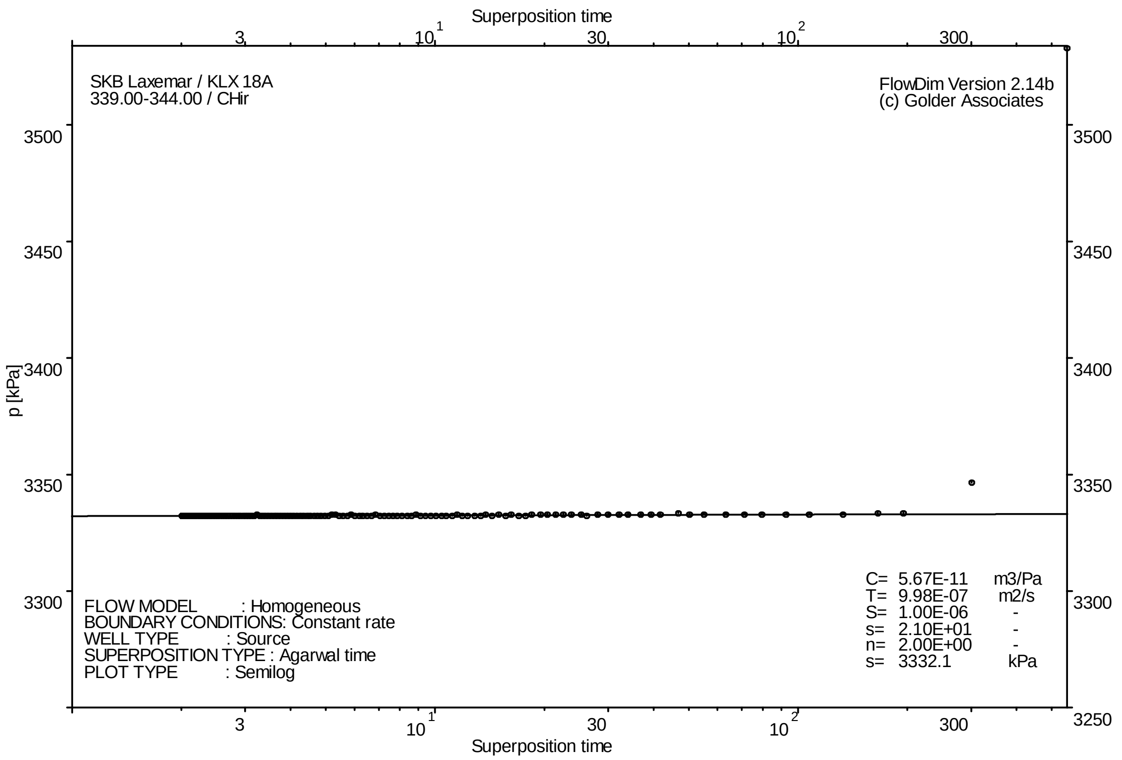
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

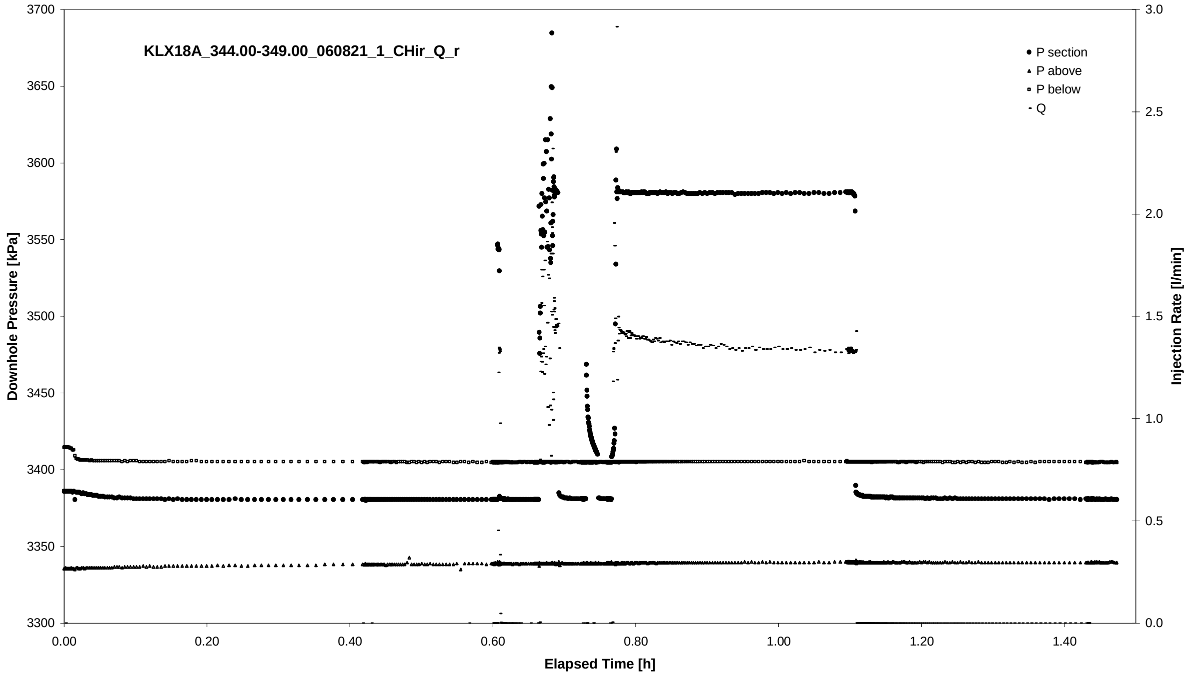


CHIR phase; HORNER match

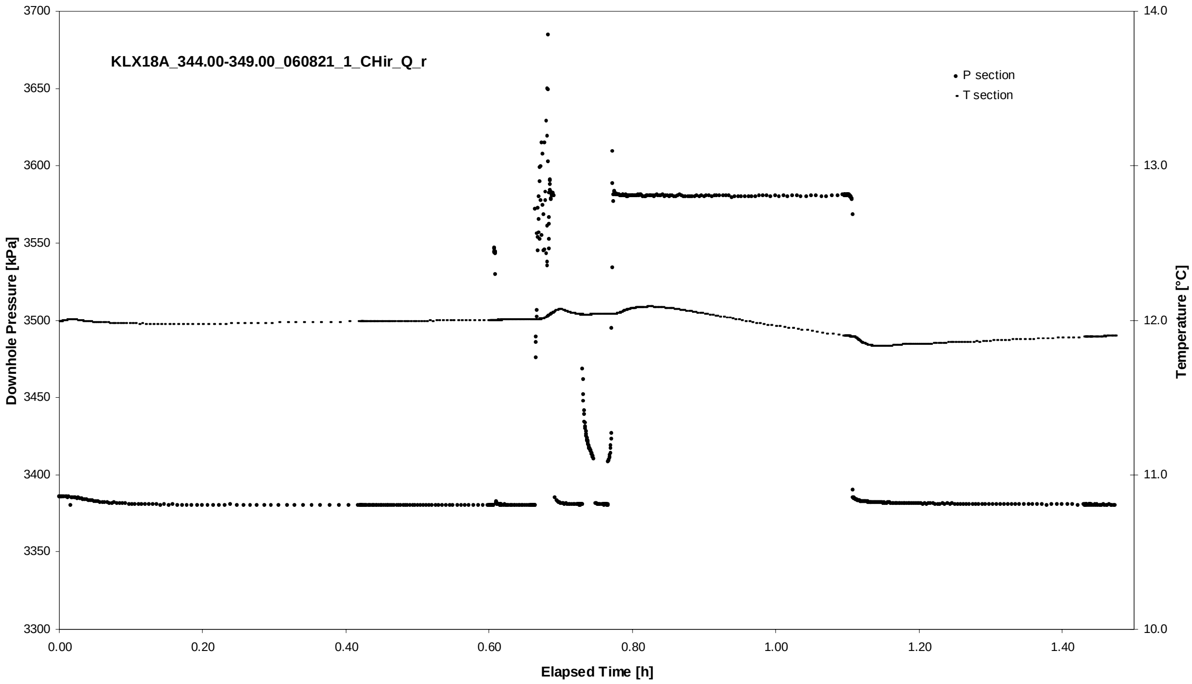
APPENDIX 2-40

Test 344.00 – 349.00 m

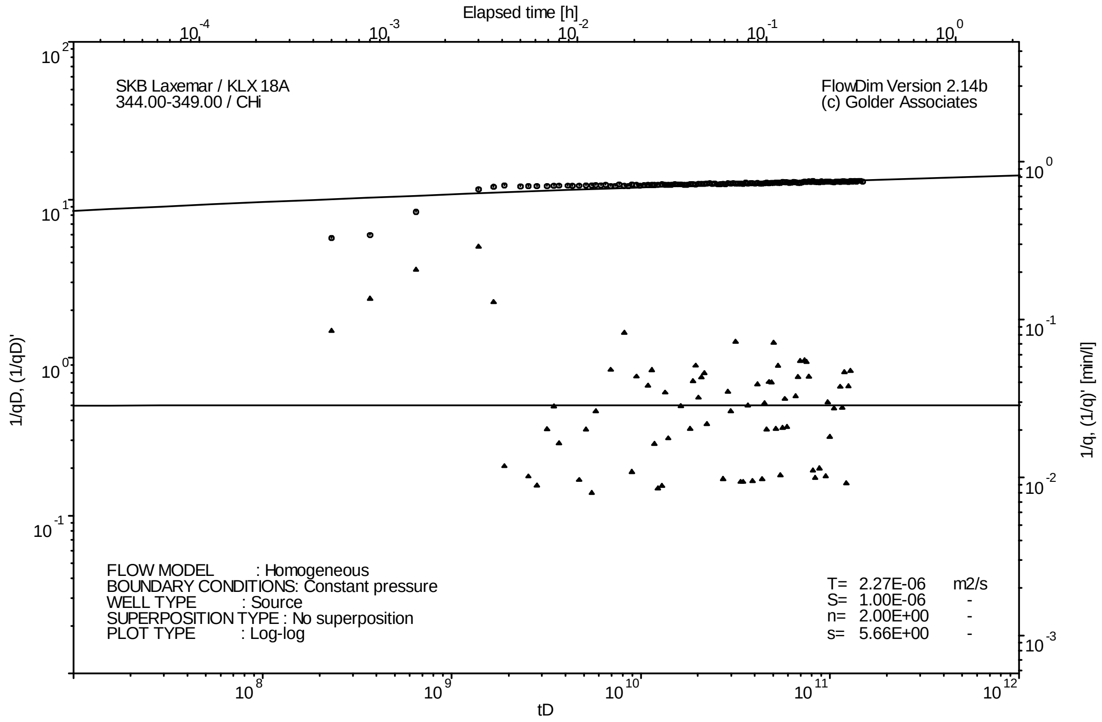
Analysis diagrams



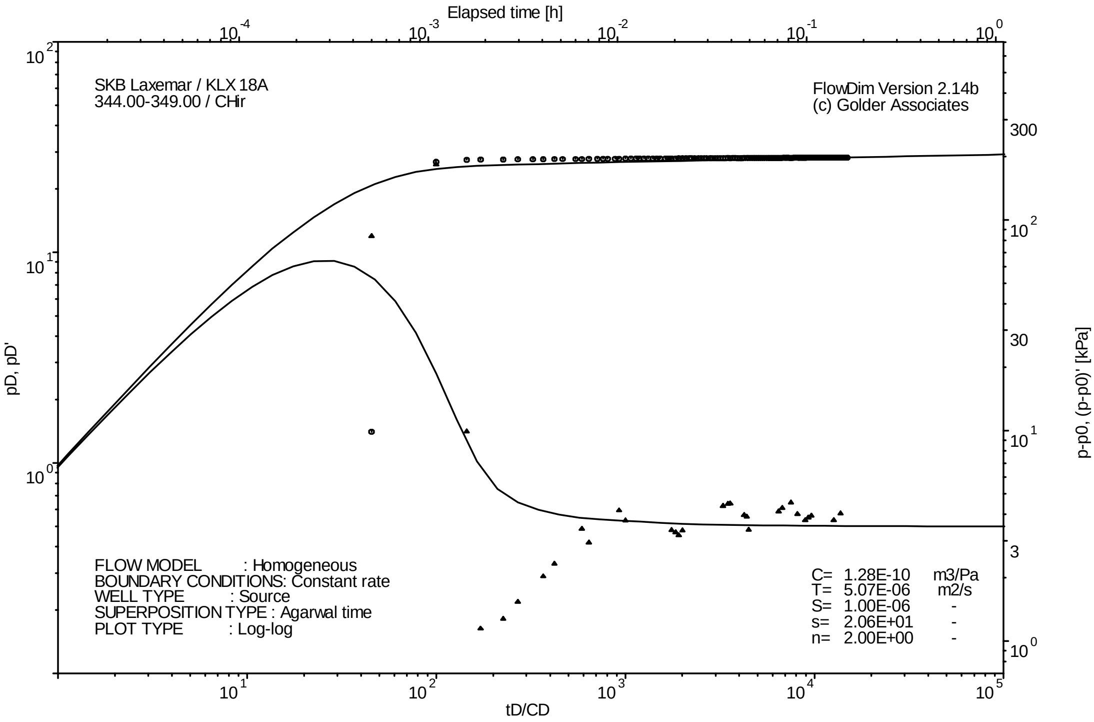
Pressure and flow rate vs. time; cartesian plot



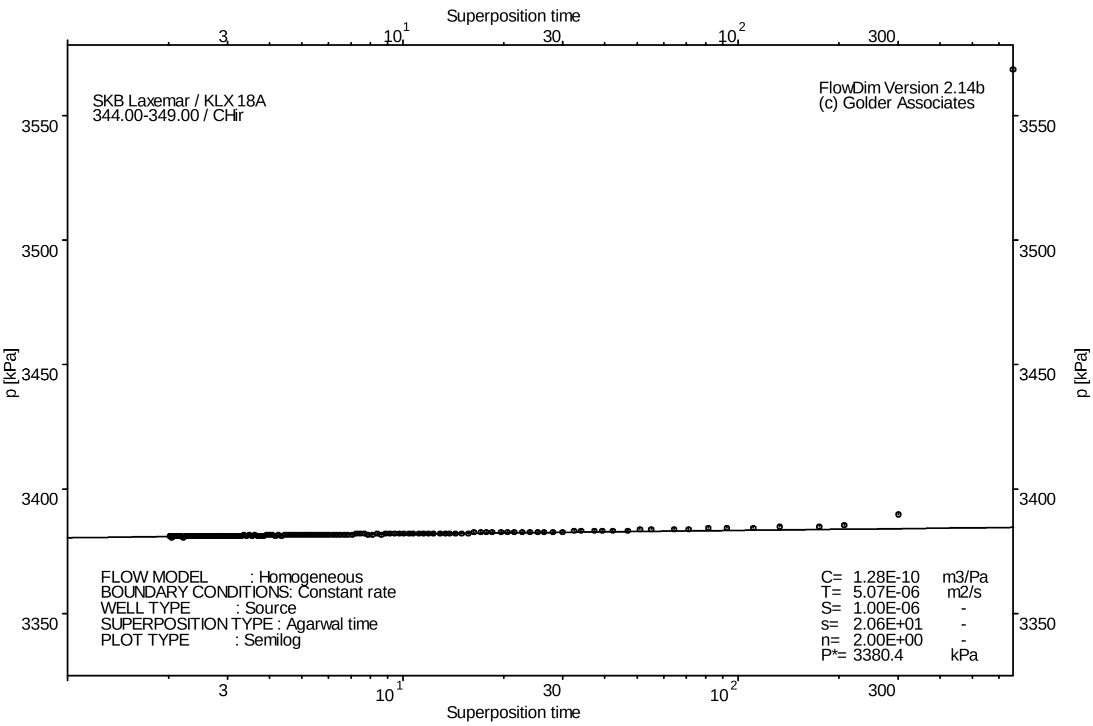
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

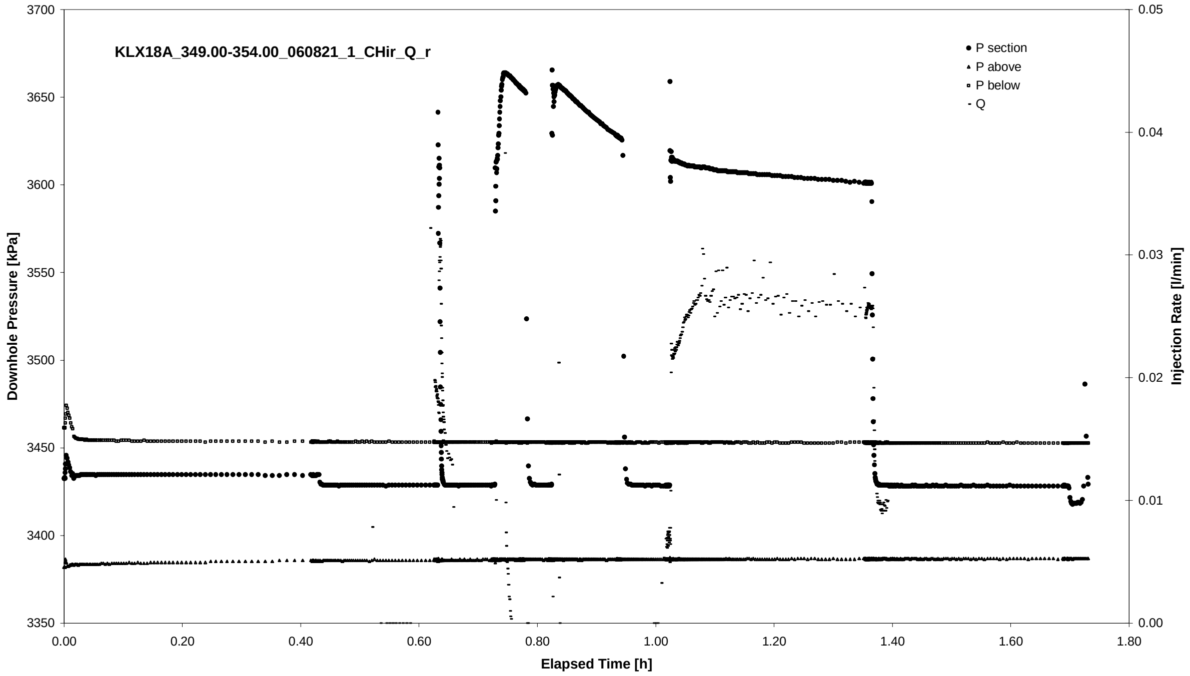


CHIR phase; HORNER match

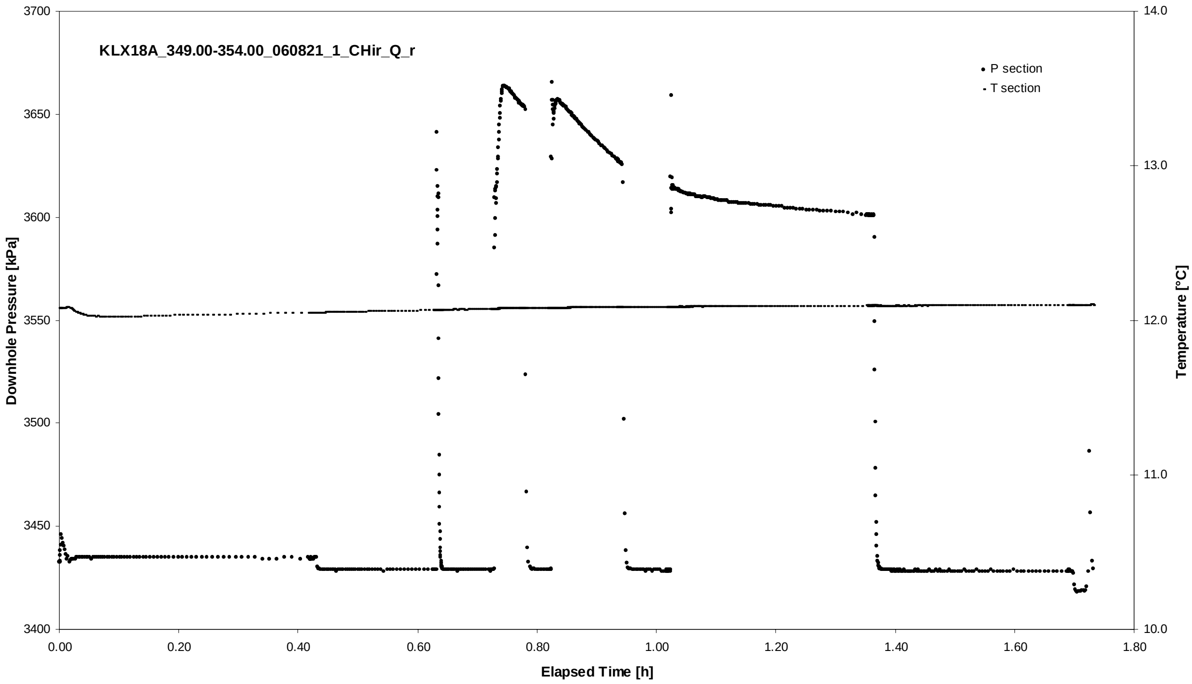
APPENDIX 2-41

Test 349.00 – 354.00 m

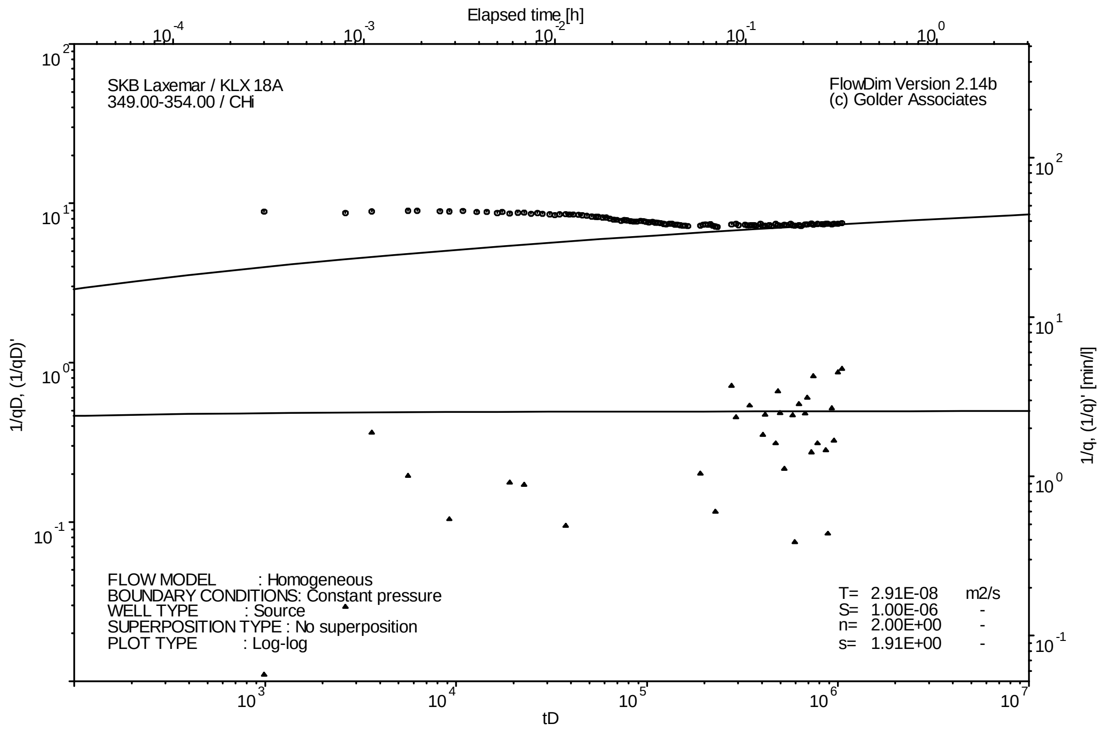
Analysis diagrams



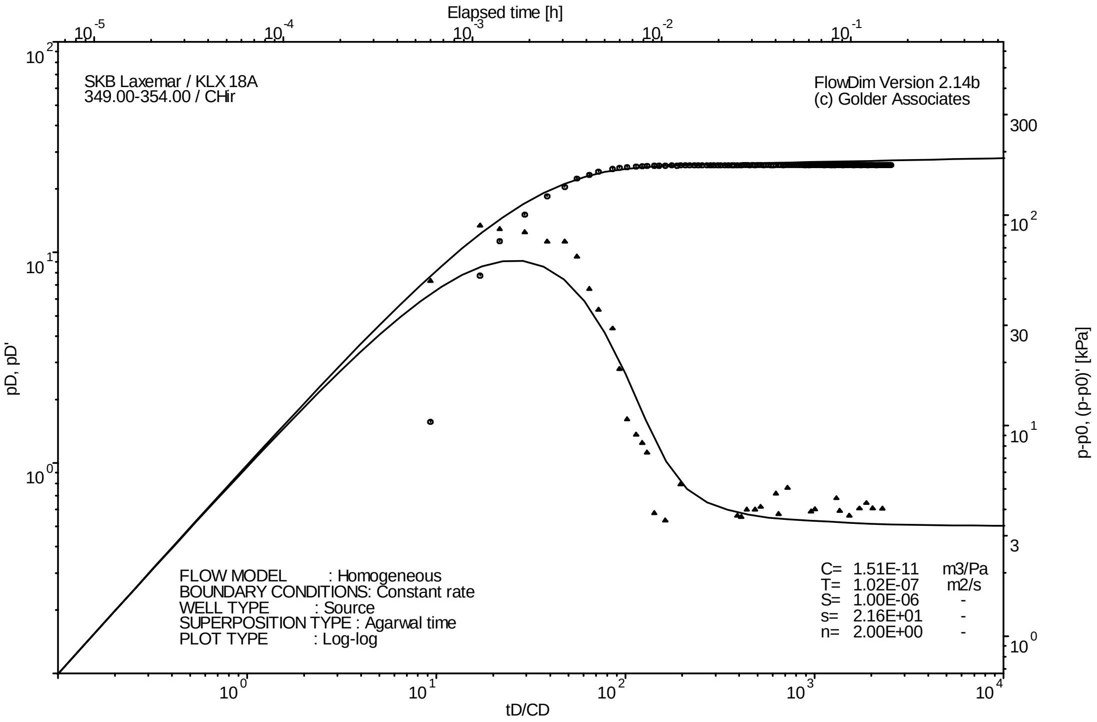
Pressure and flow rate vs. time; cartesian plot



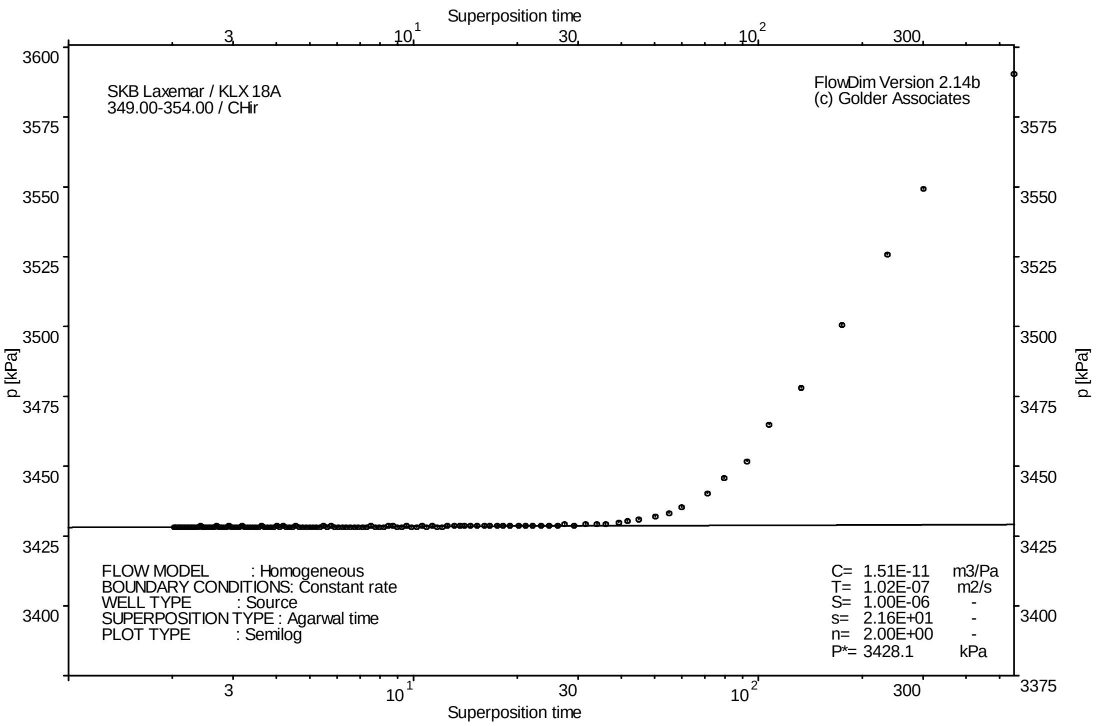
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

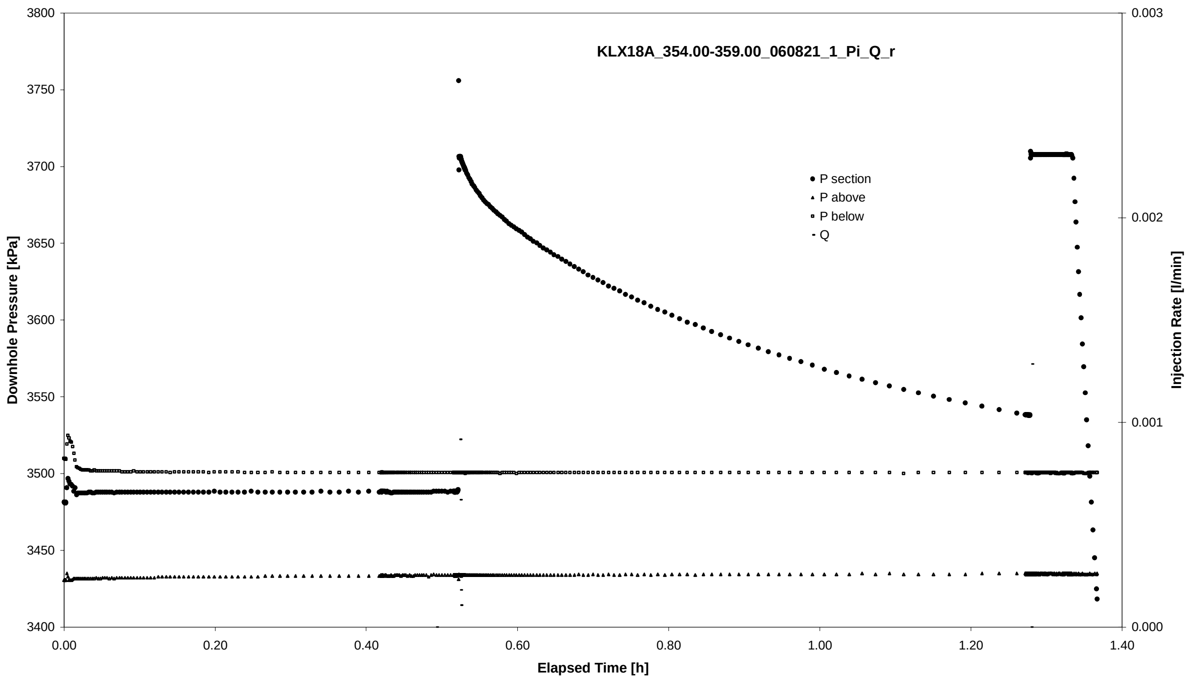


CHIR phase; HORNER match

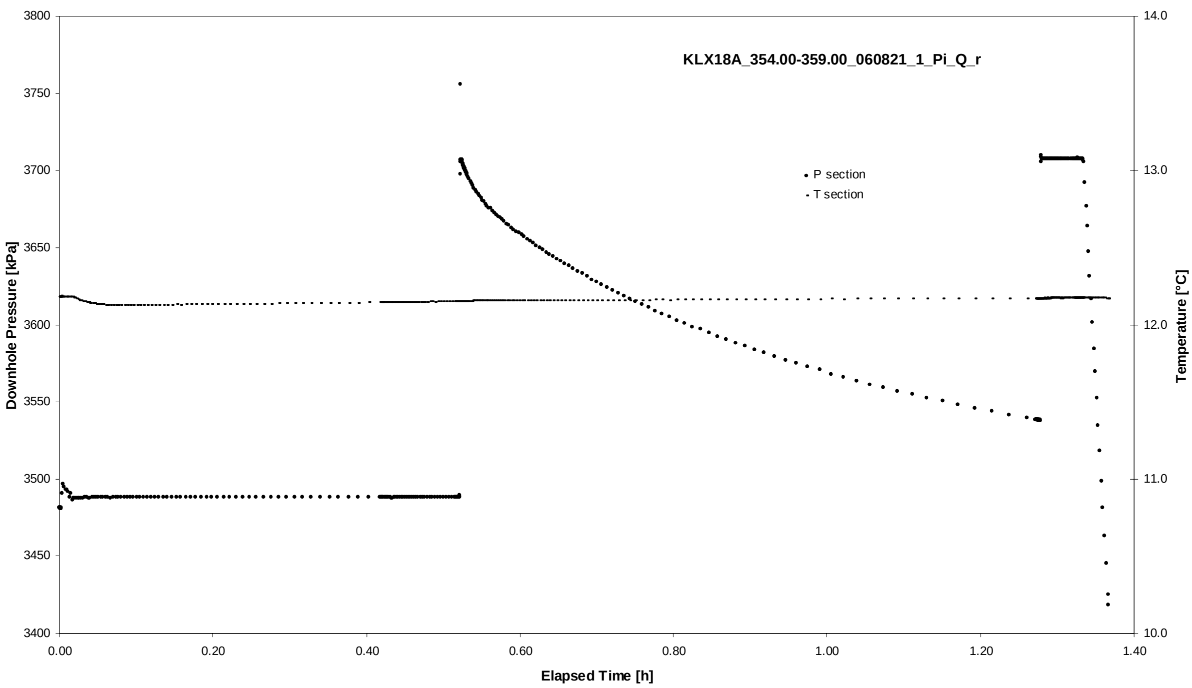
APPENDIX 2-42

Test 354.00 – 359.00 m

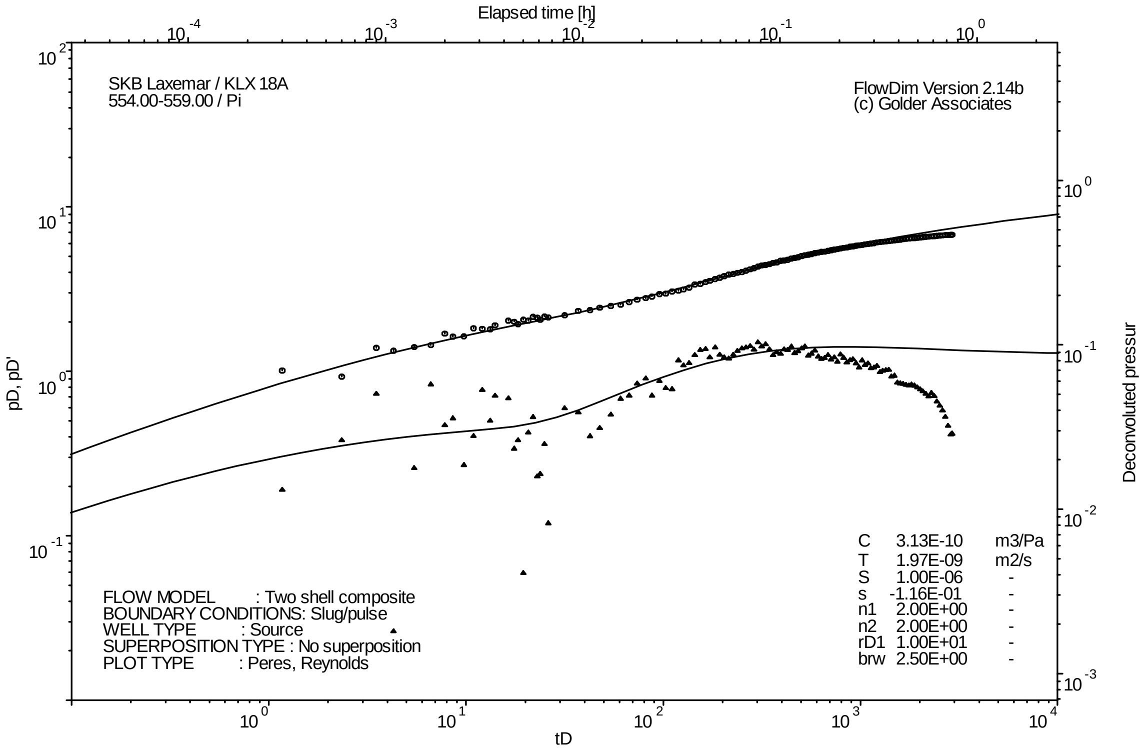
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

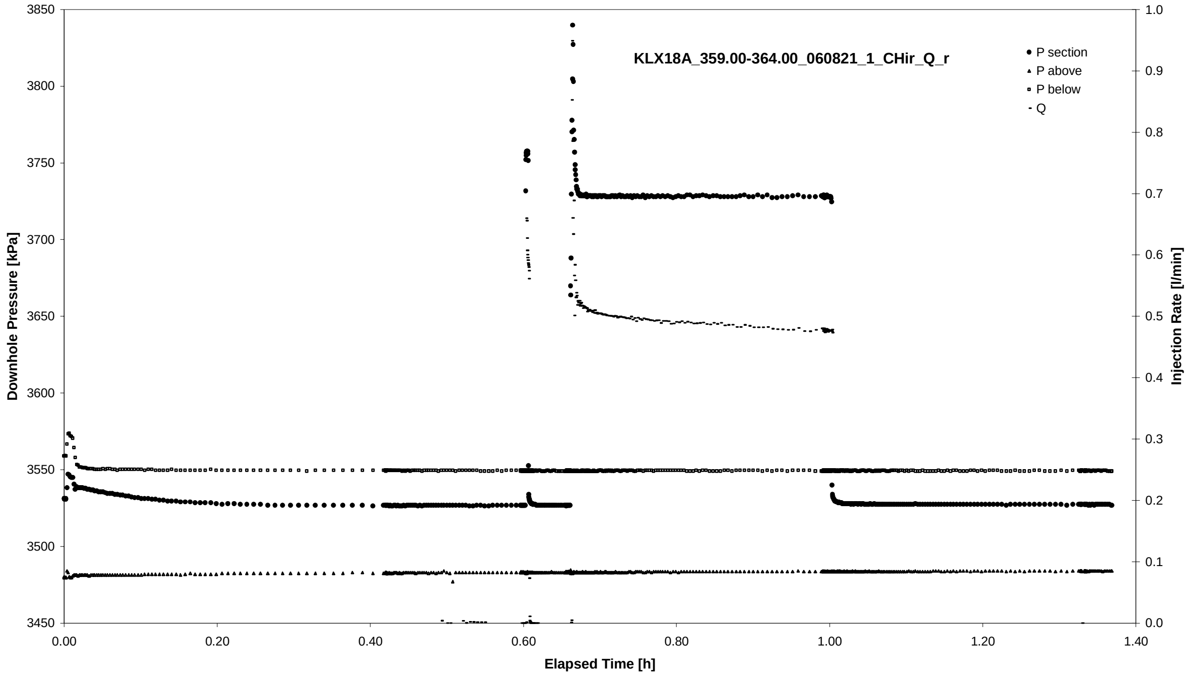


Pulse injection; deconvolution match

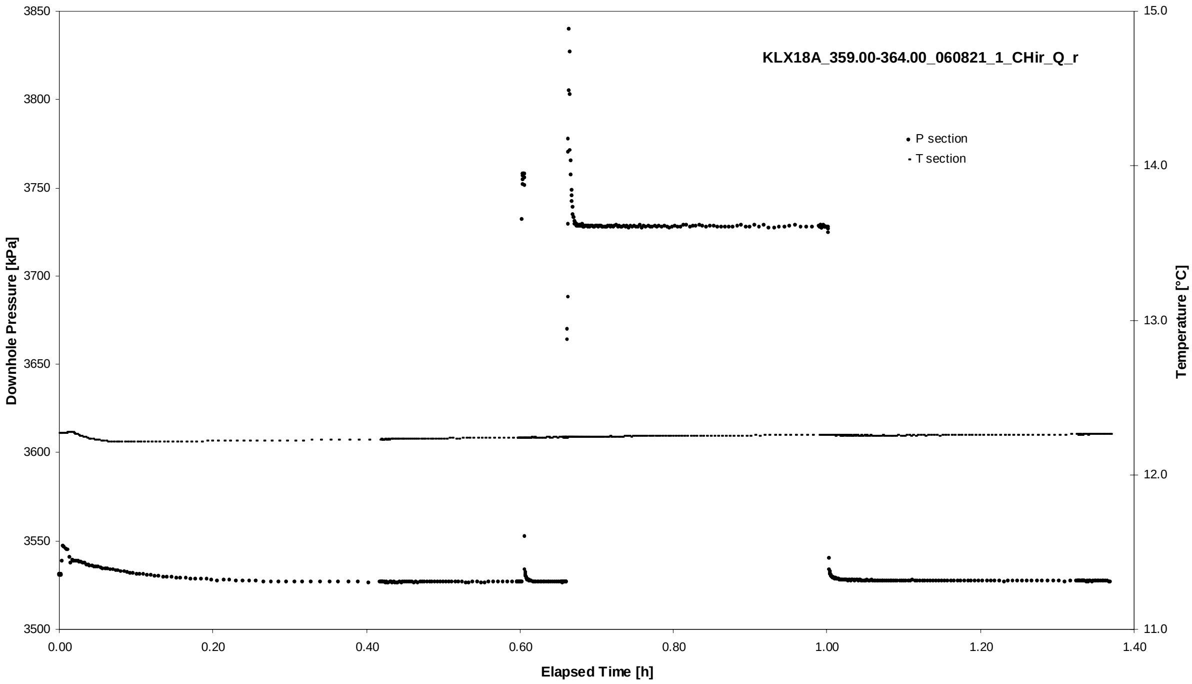
APPENDIX 2-43

Test 359.00 – 364.00 m

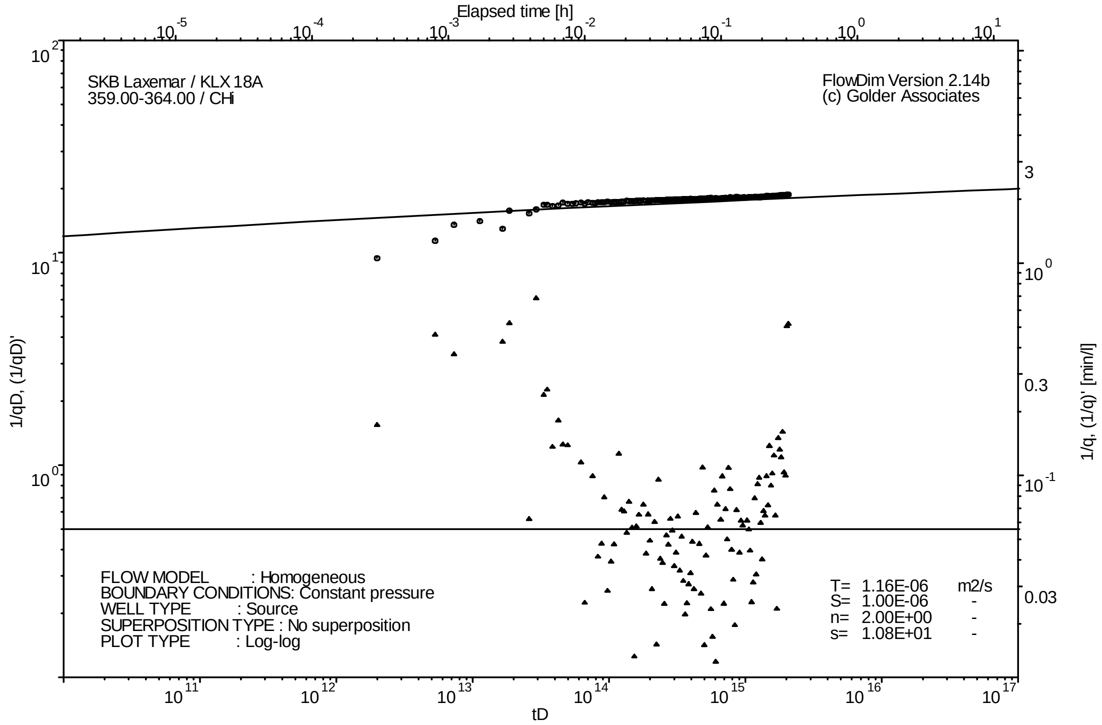
Analysis diagrams



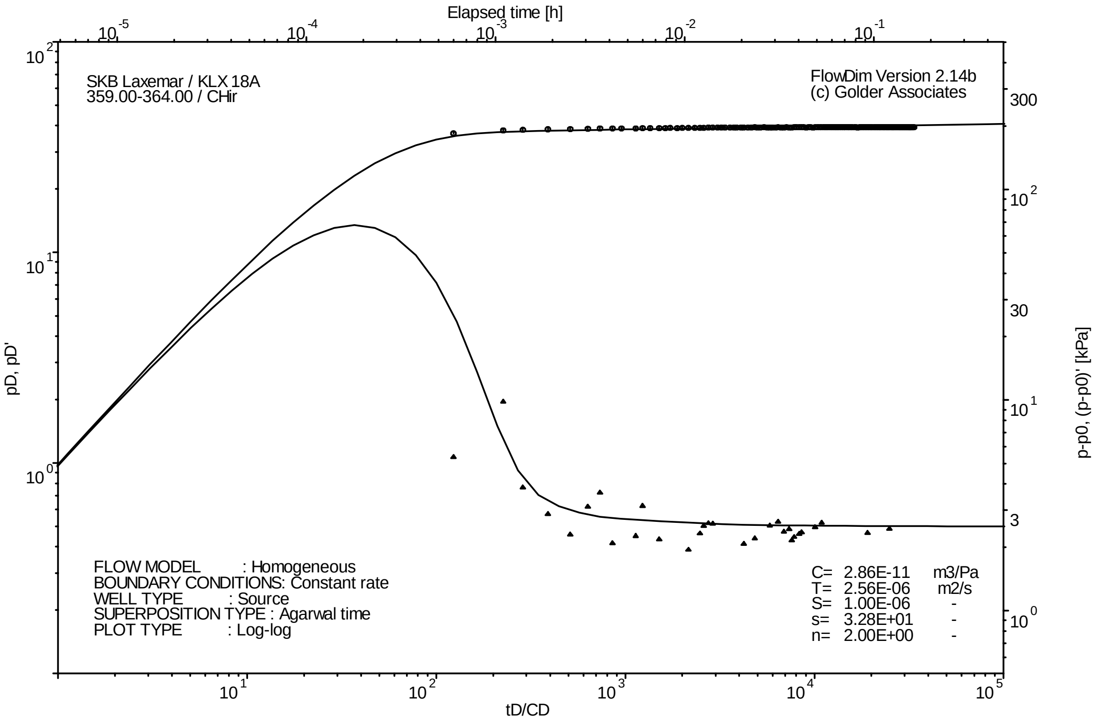
Pressure and flow rate vs. time; cartesian plot



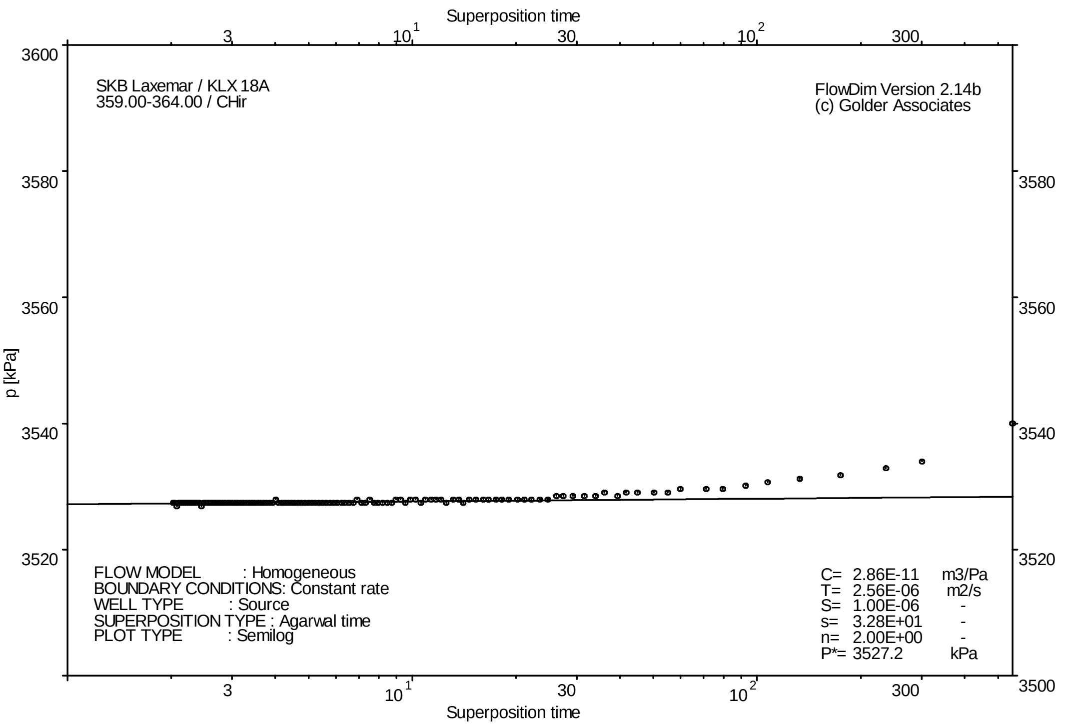
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

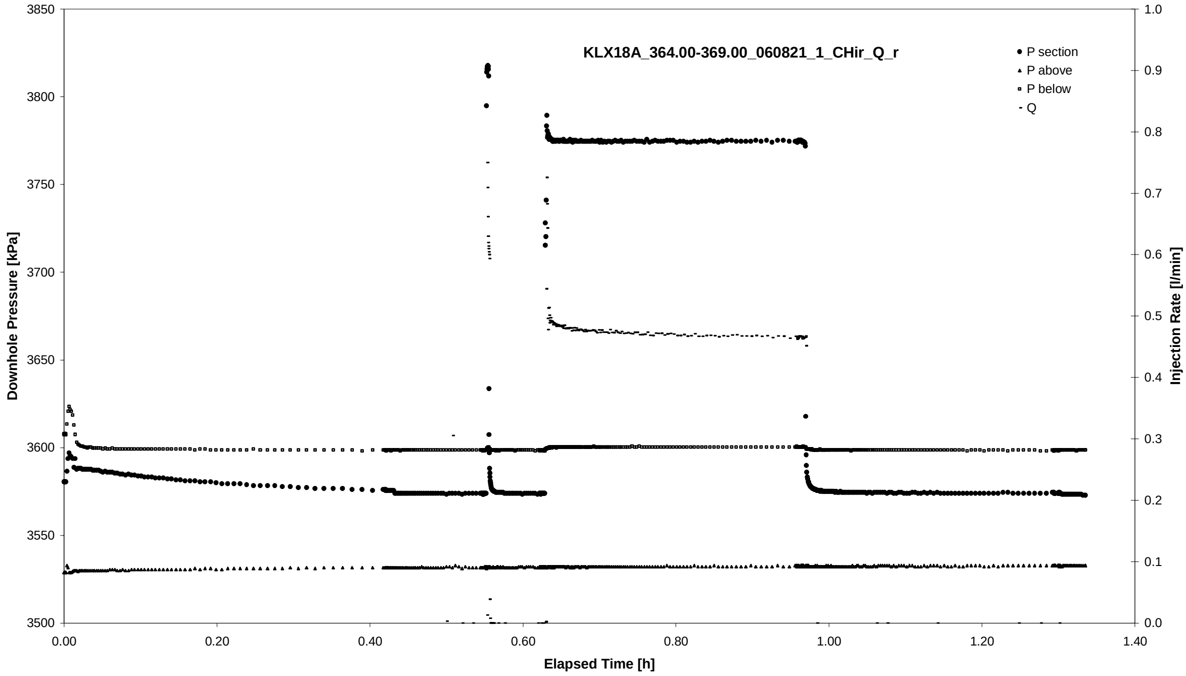


CHIR phase; HORNER match

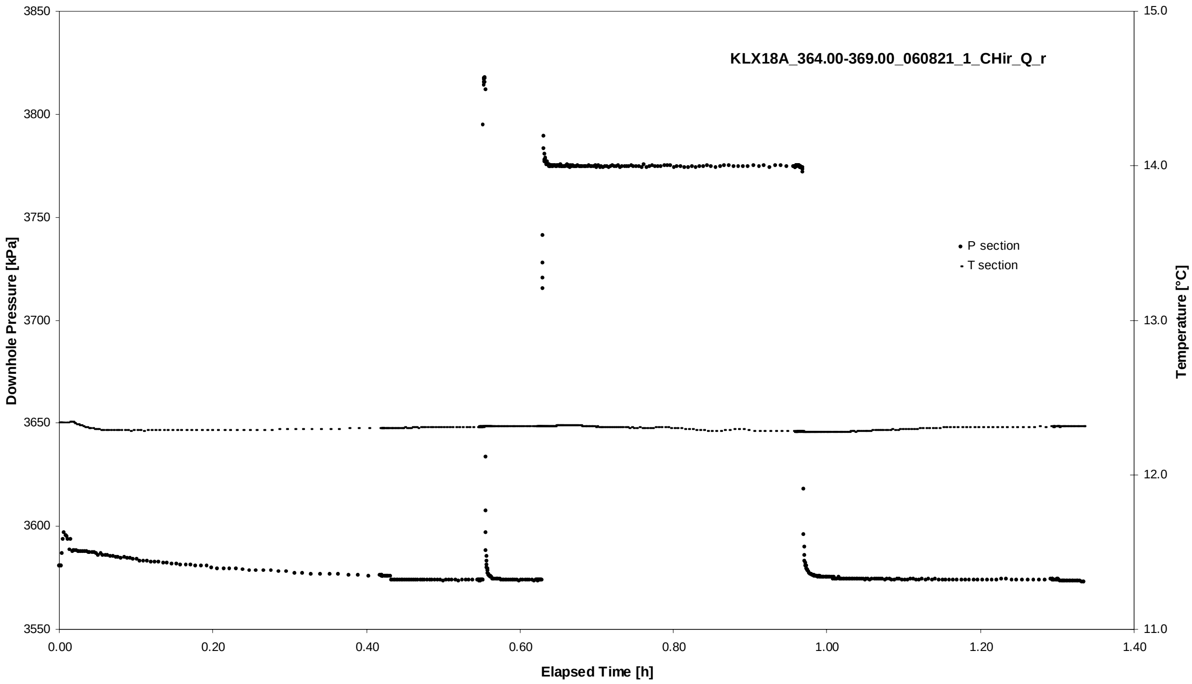
APPENDIX 2-44

Test 364.00 – 369.00 m

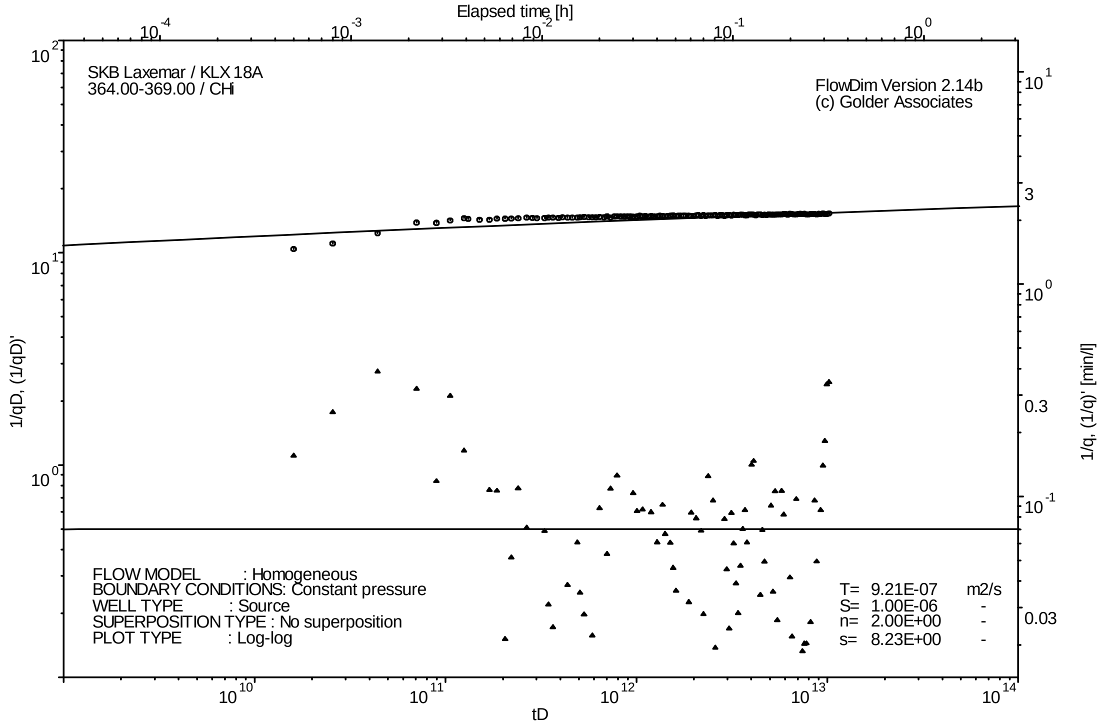
Analysis diagrams



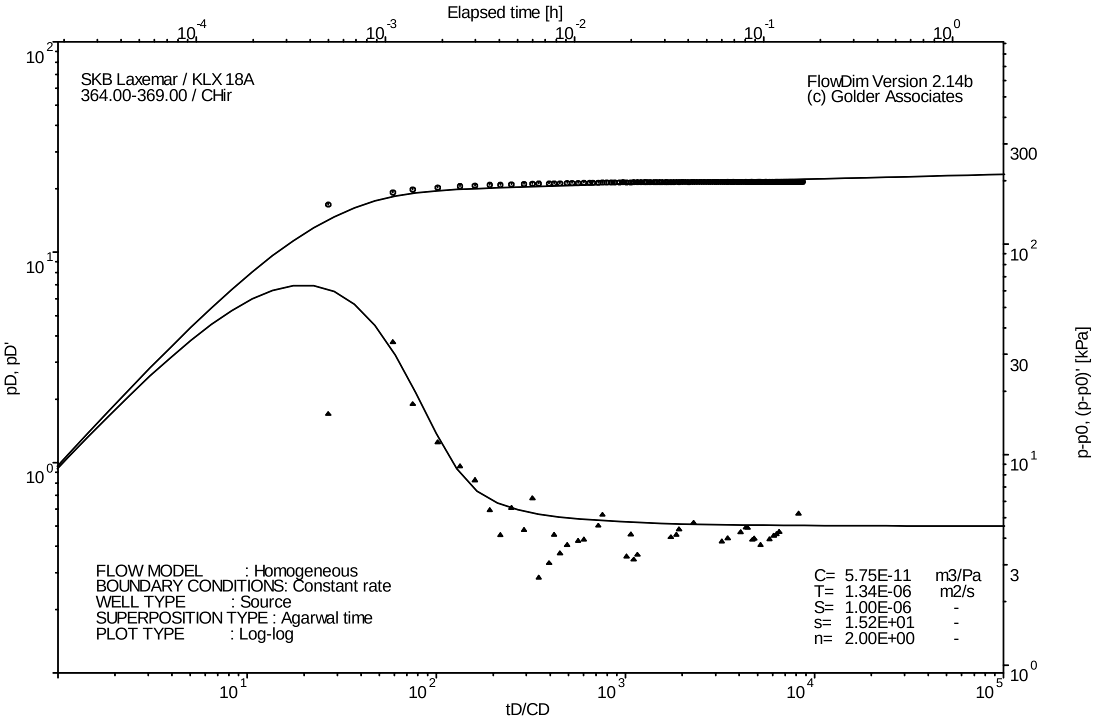
Pressure and flow rate vs. time; cartesian plot



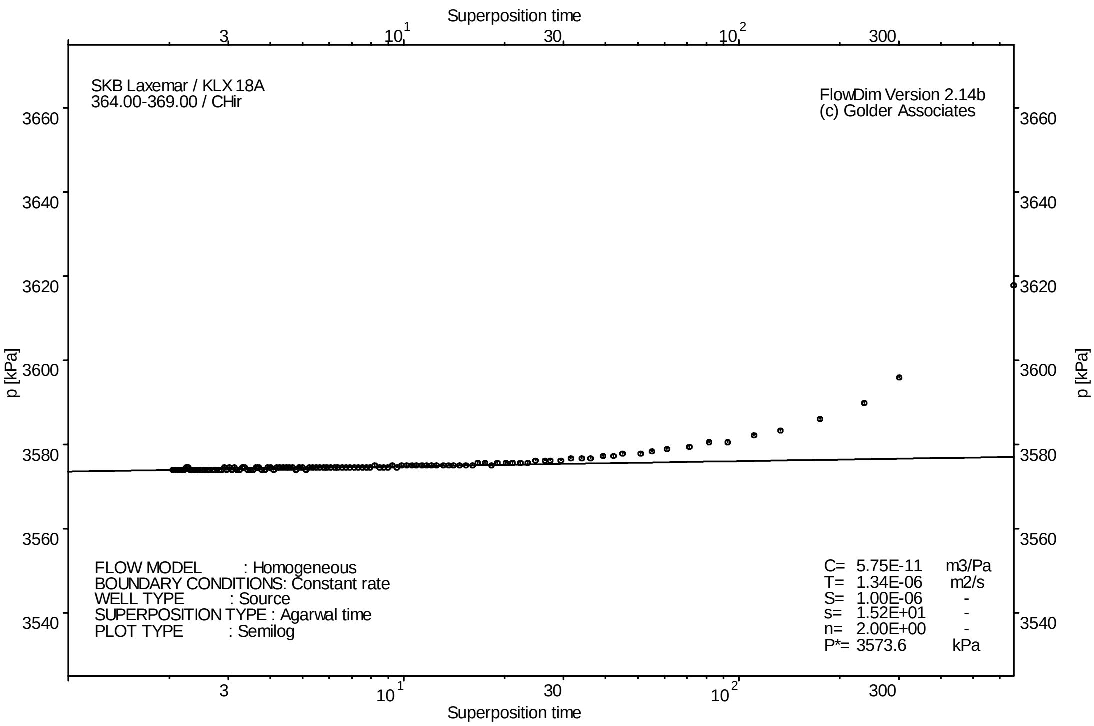
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

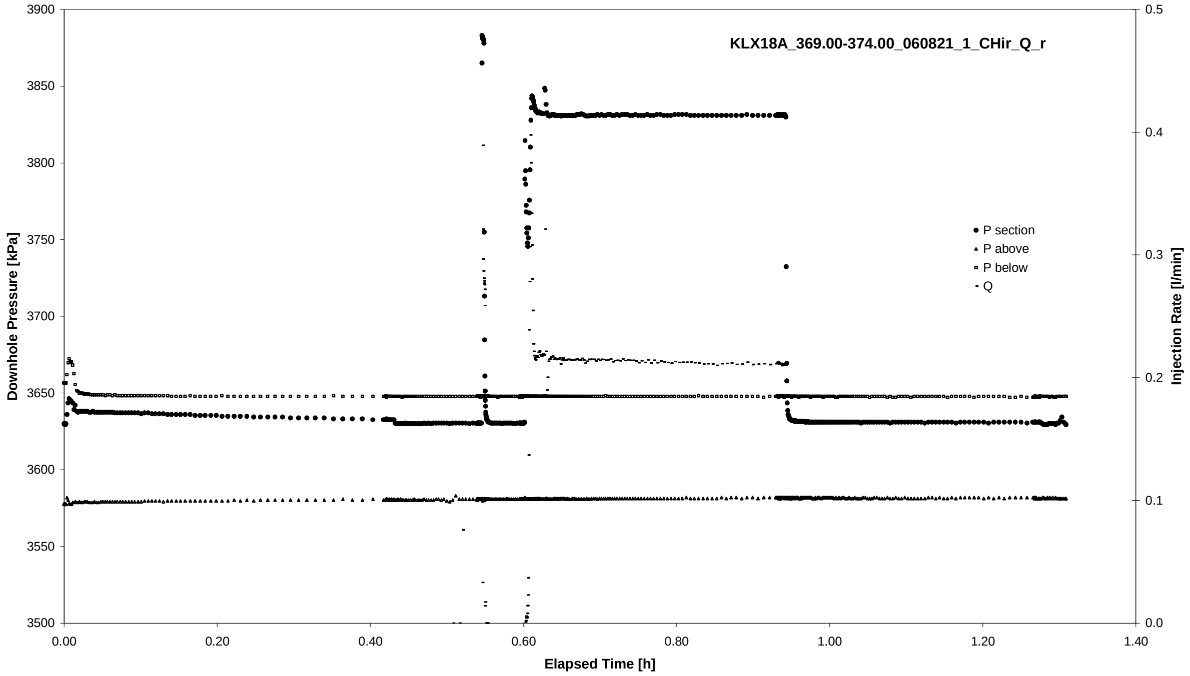


CHIR phase; HORNER match

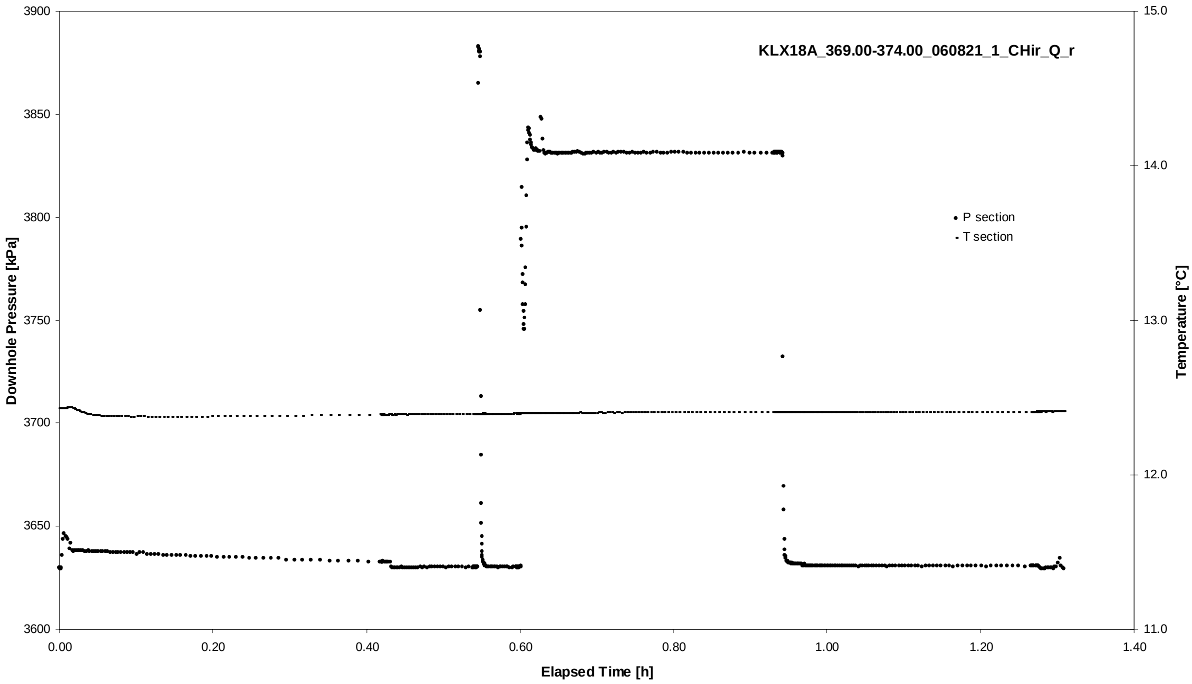
APPENDIX 2-45

Test 369.00 – 374.00 m

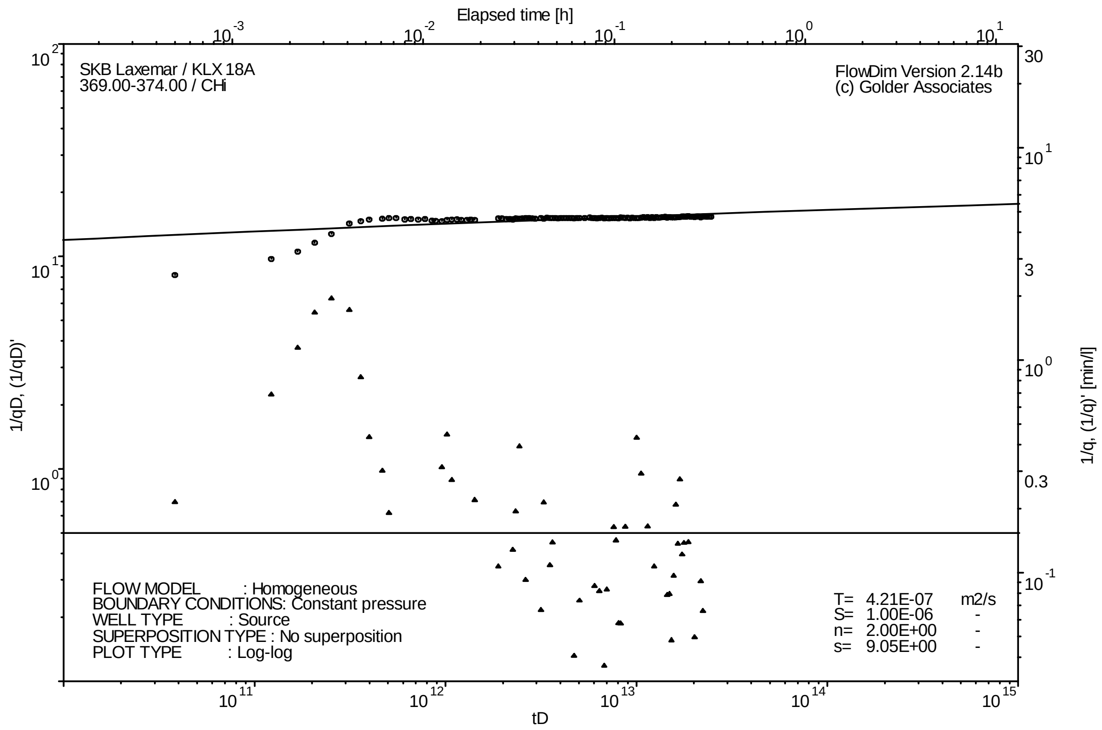
Analysis diagrams



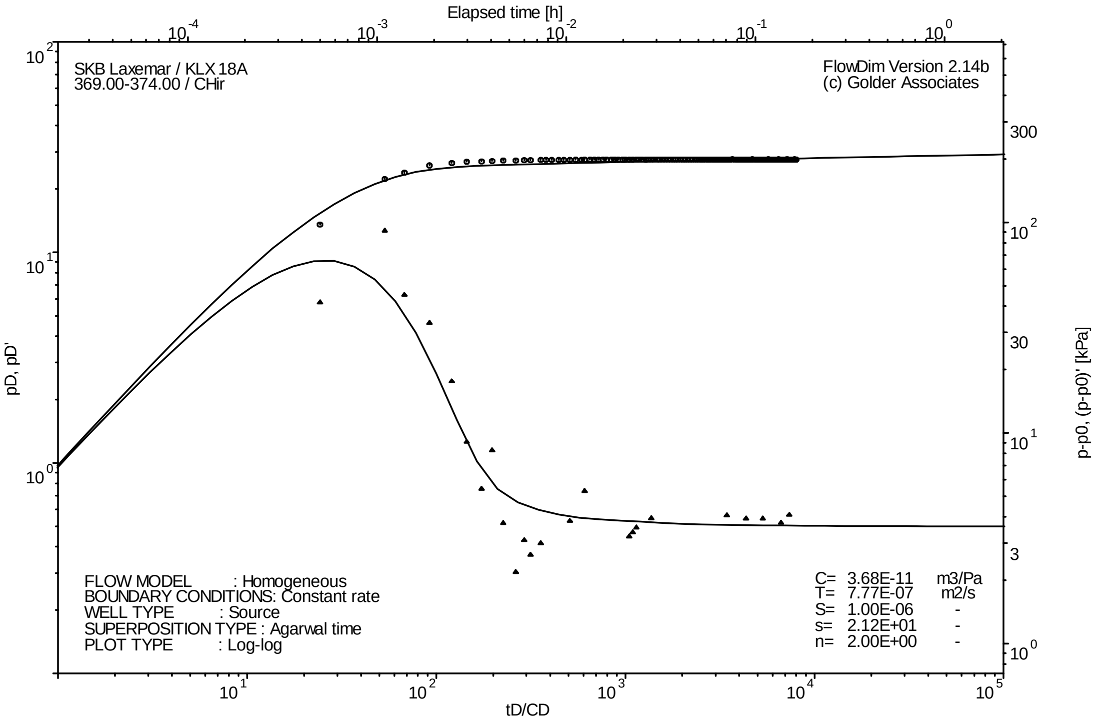
Pressure and flow rate vs. time; cartesian plot



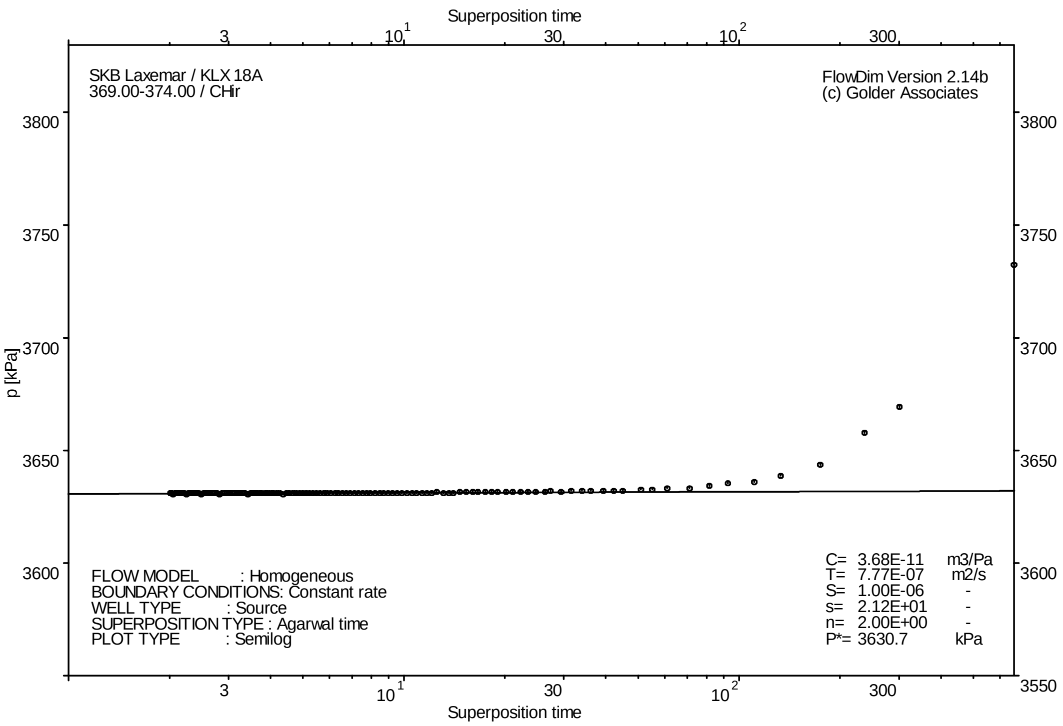
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

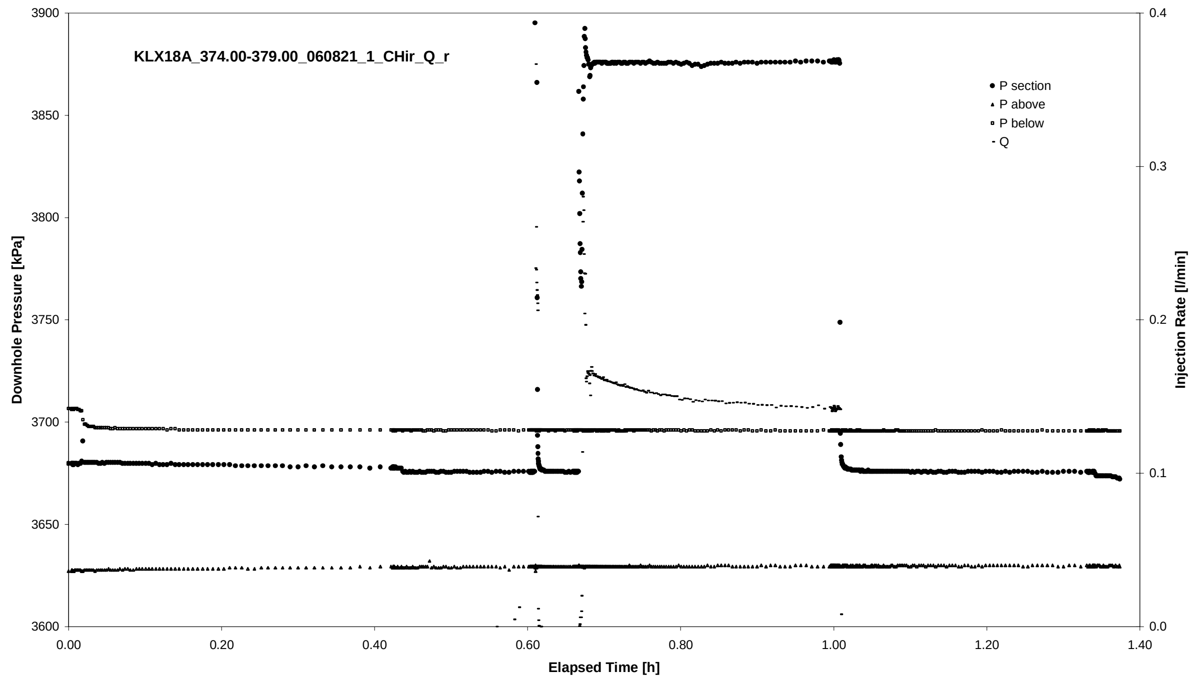


CHIR phase; HORNER match

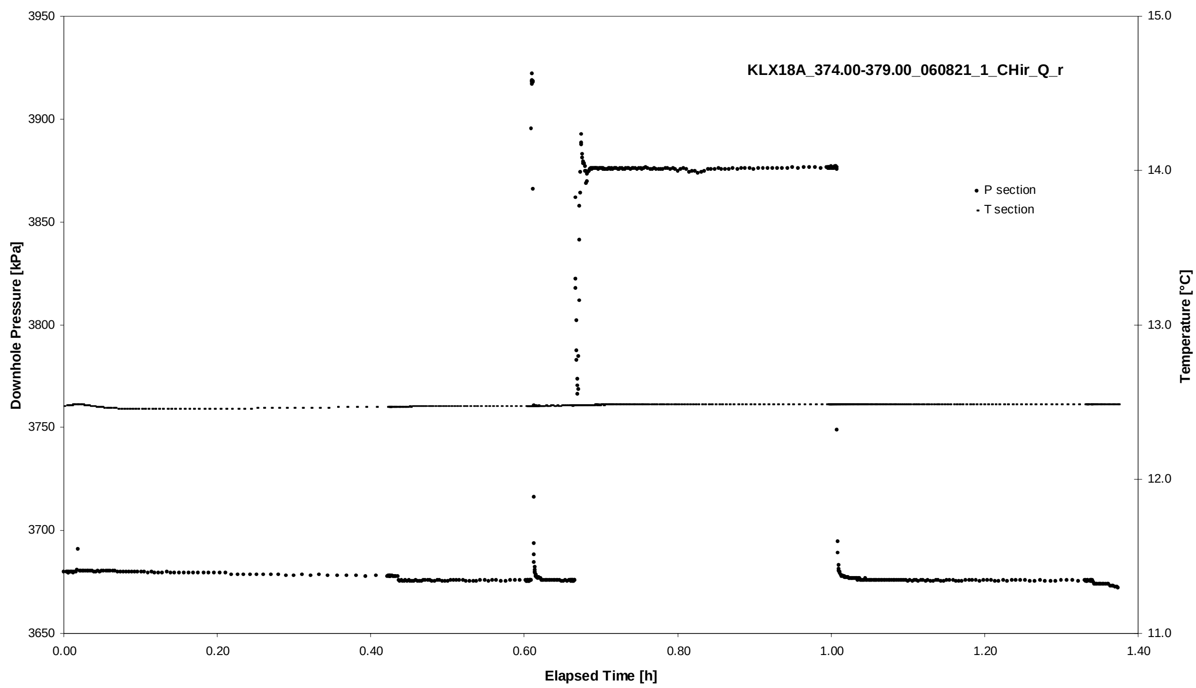
APPENDIX 2-46

Test 374.00 – 379.00 m

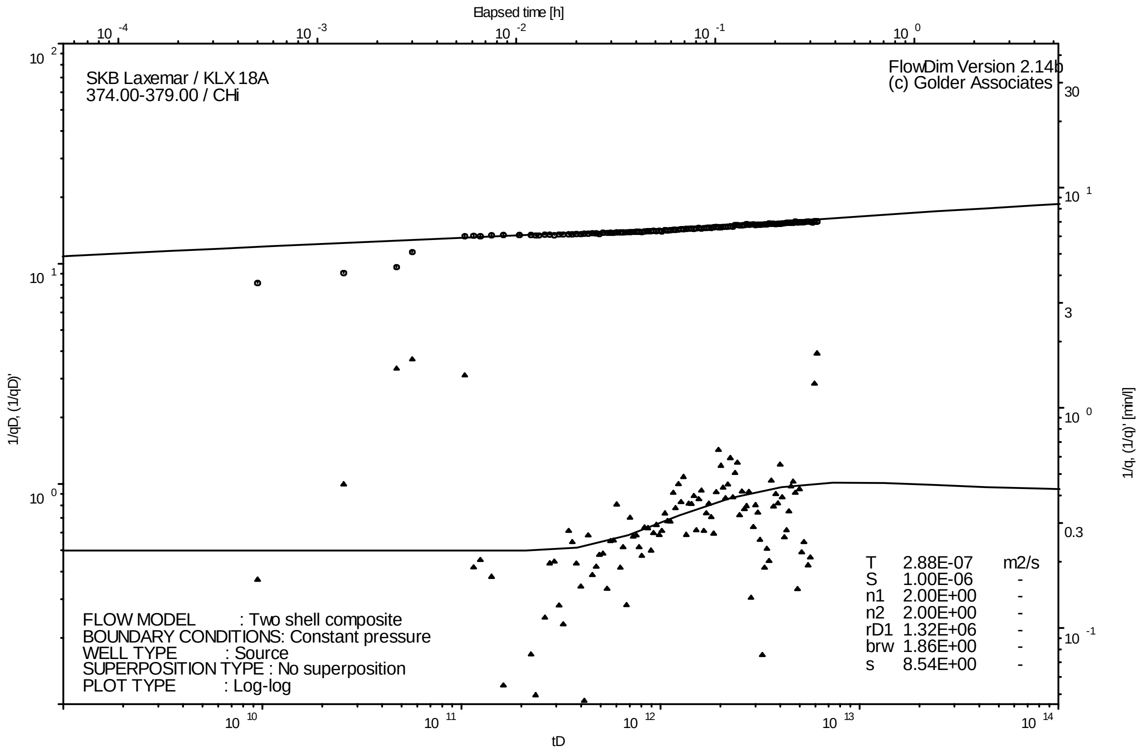
Analysis diagrams



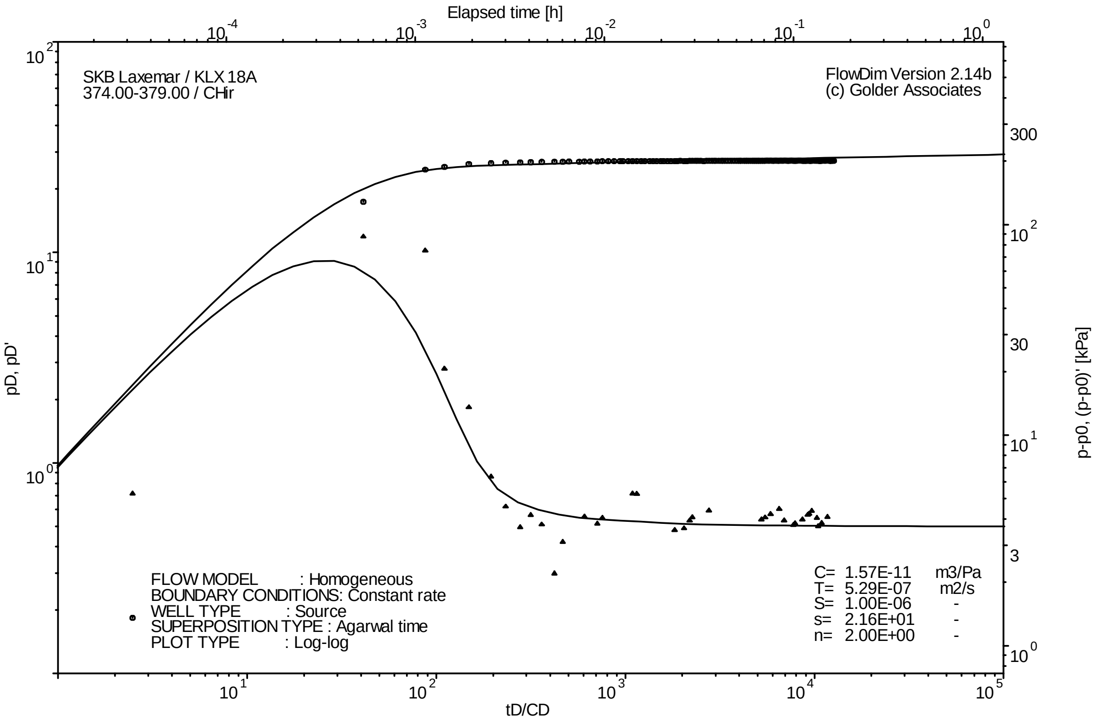
Pressure and flow rate vs. time; cartesian plot



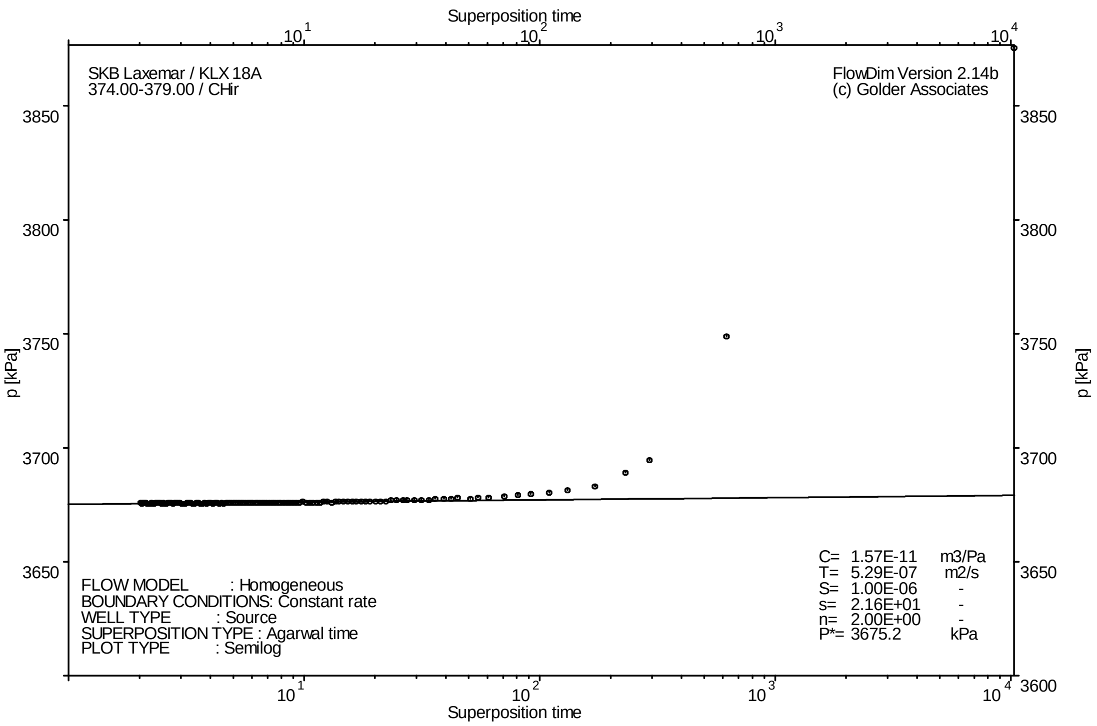
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

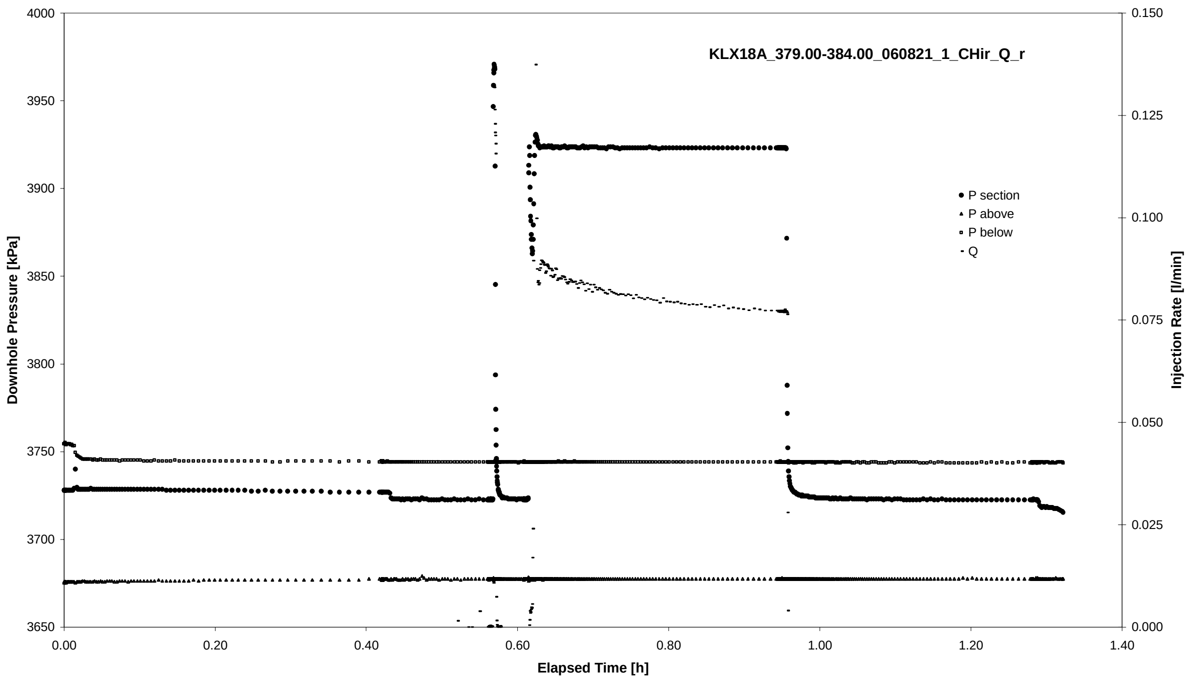


CHIR phase; HORNER match

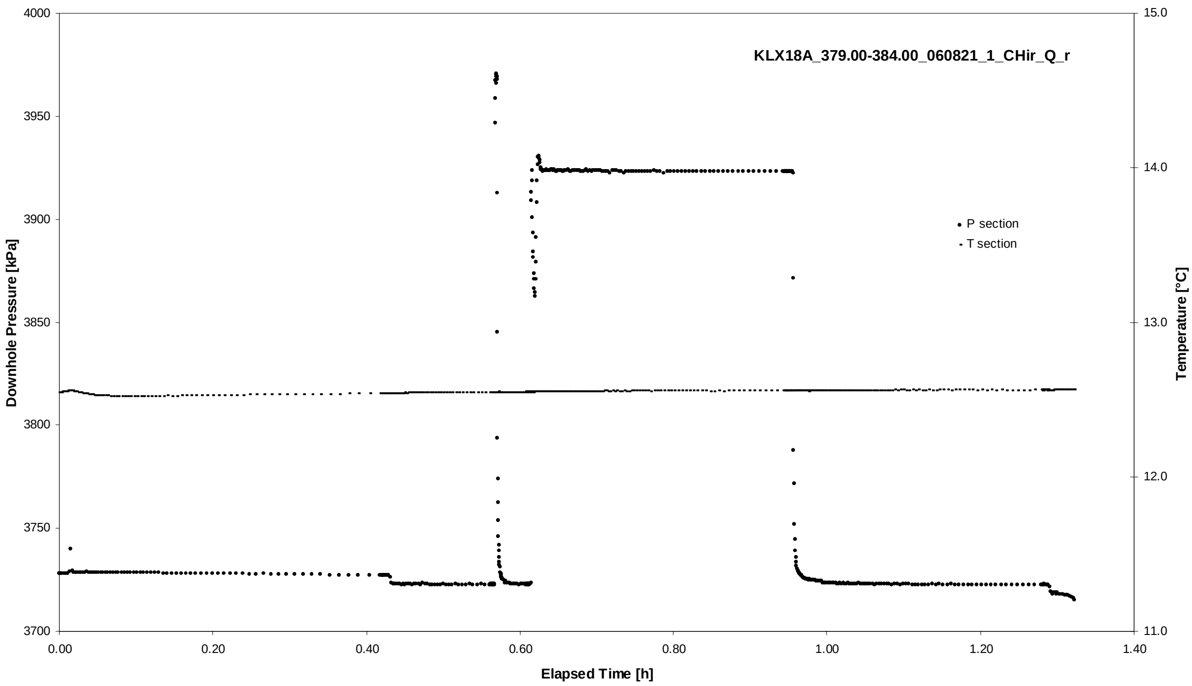
APPENDIX 2-47

Test 379.00 – 384.00 m

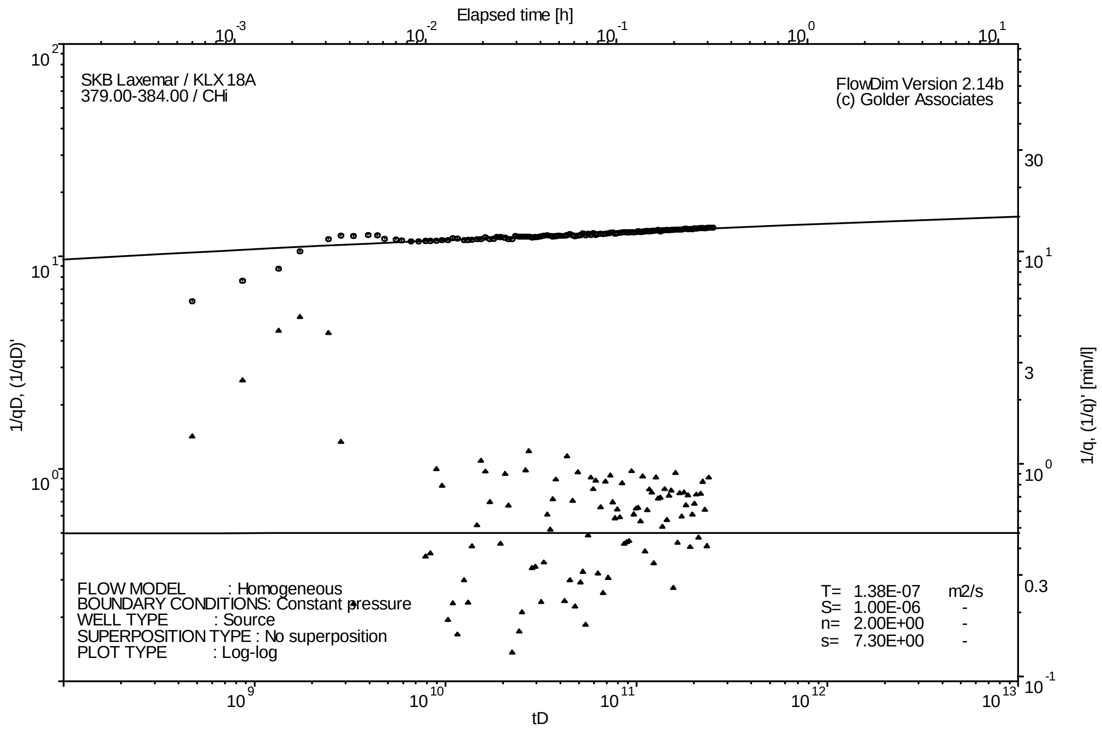
Analysis diagrams



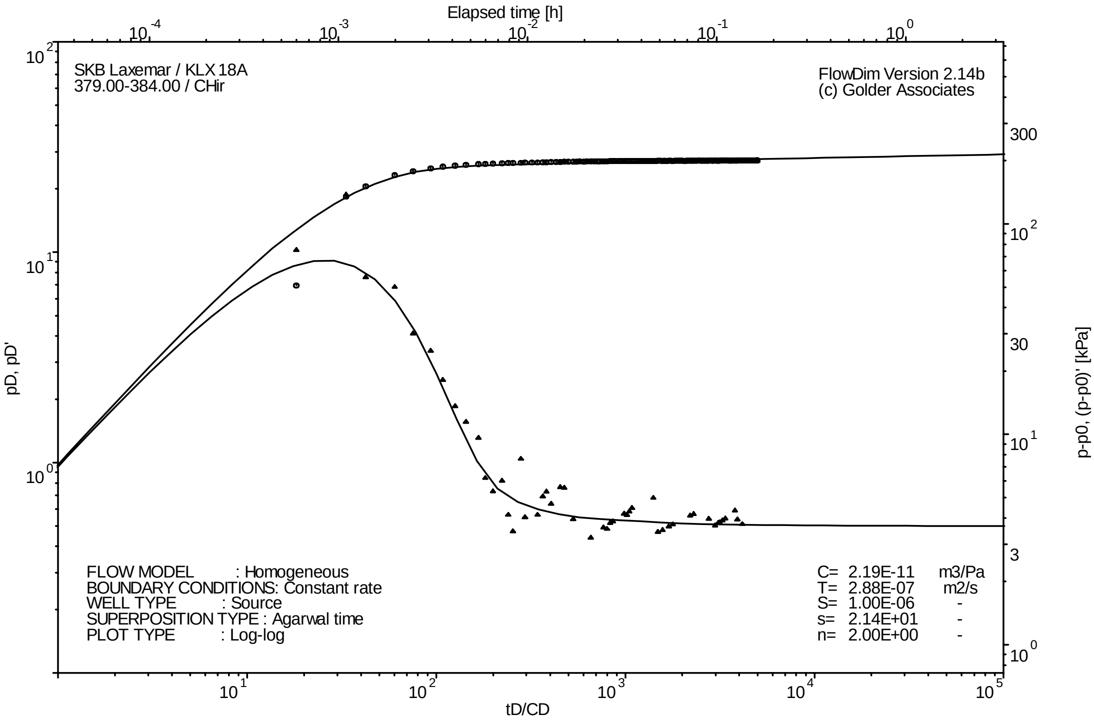
Pressure and flow rate vs. time; cartesian plot



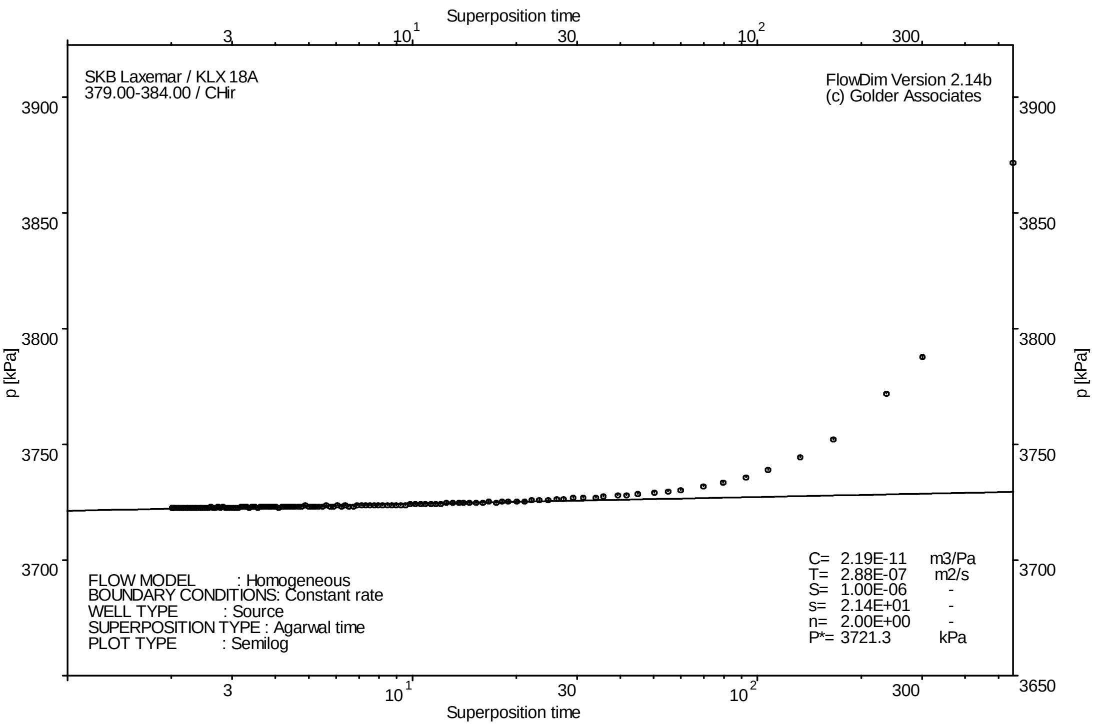
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

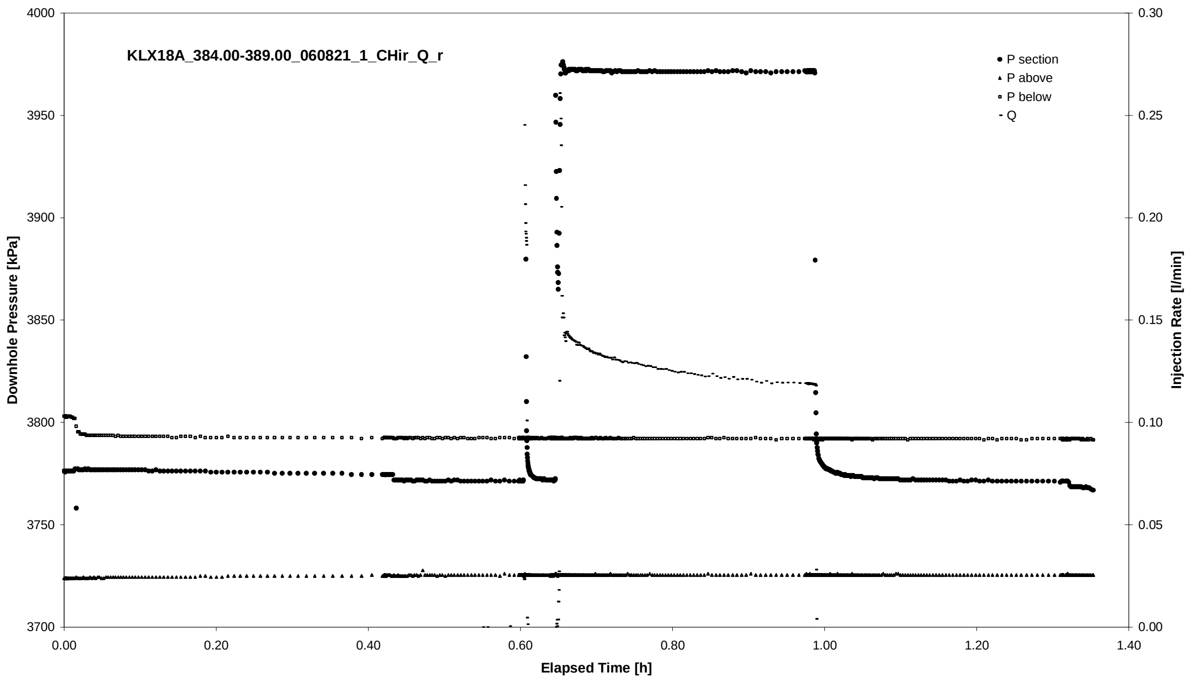


CHIR phase; HORNER match

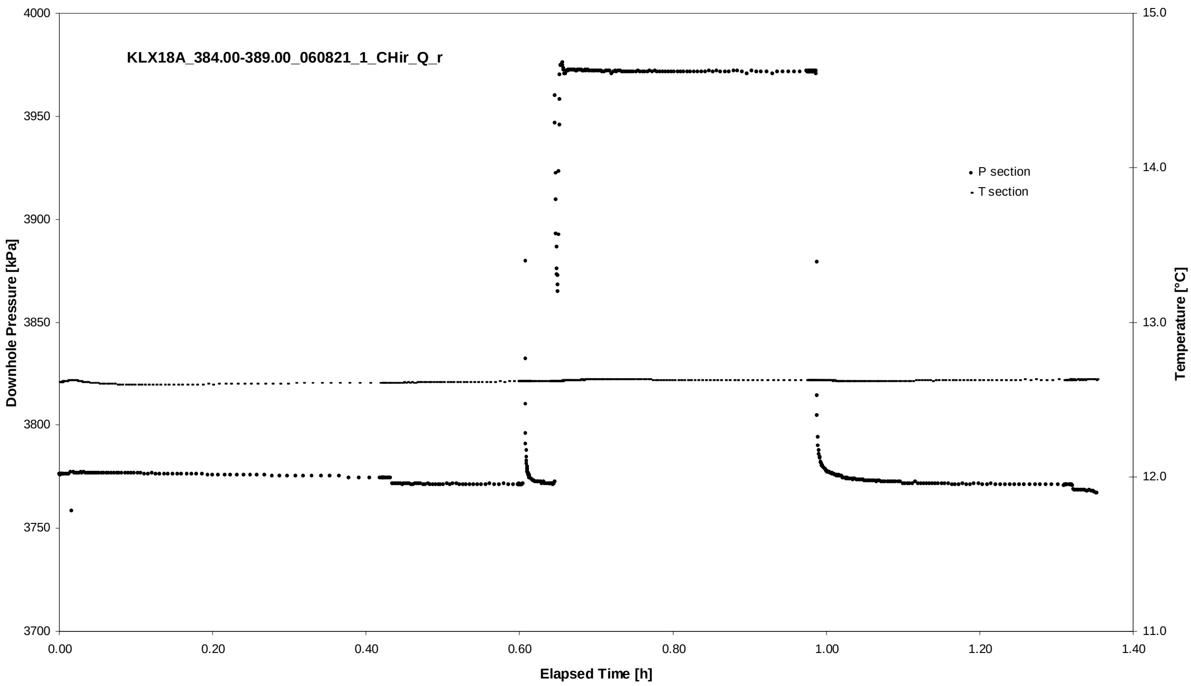
APPENDIX 2-48

Test 384.00 – 389.00 m

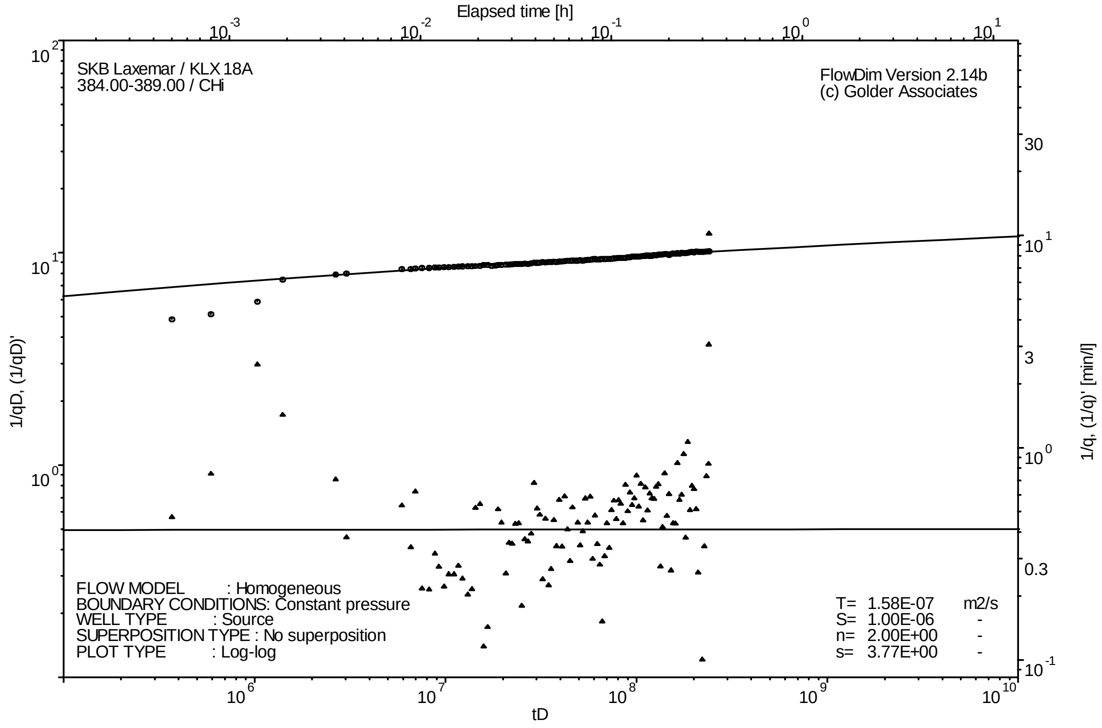
Analysis diagrams



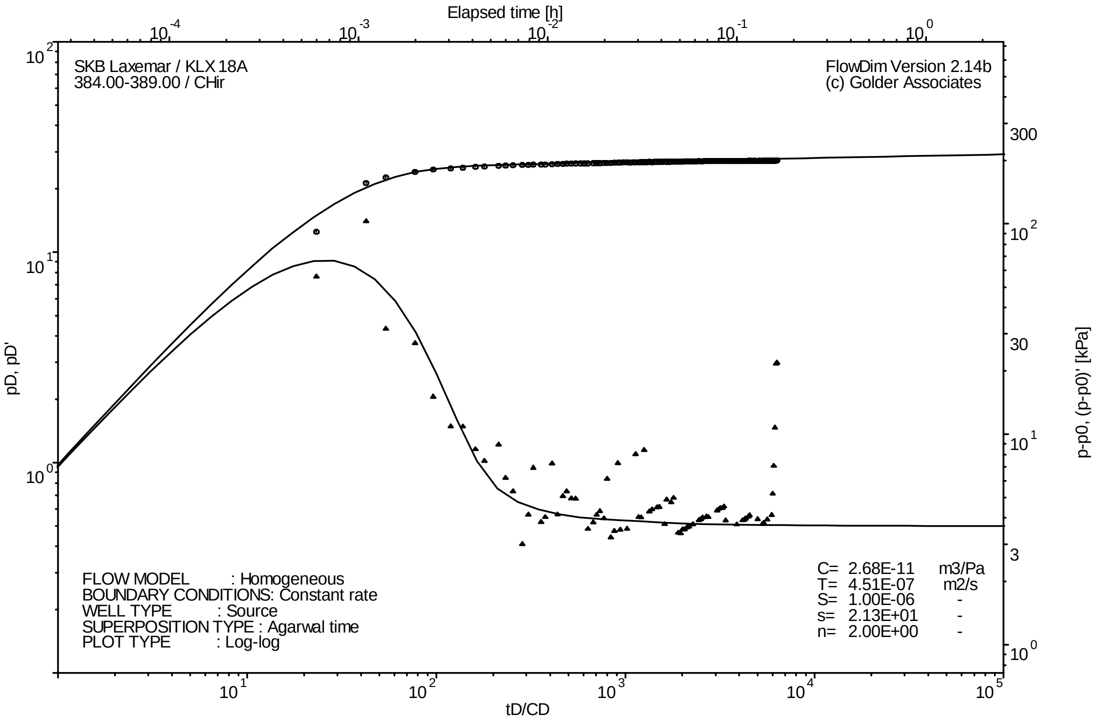
Pressure and flow rate vs. time; cartesian plot



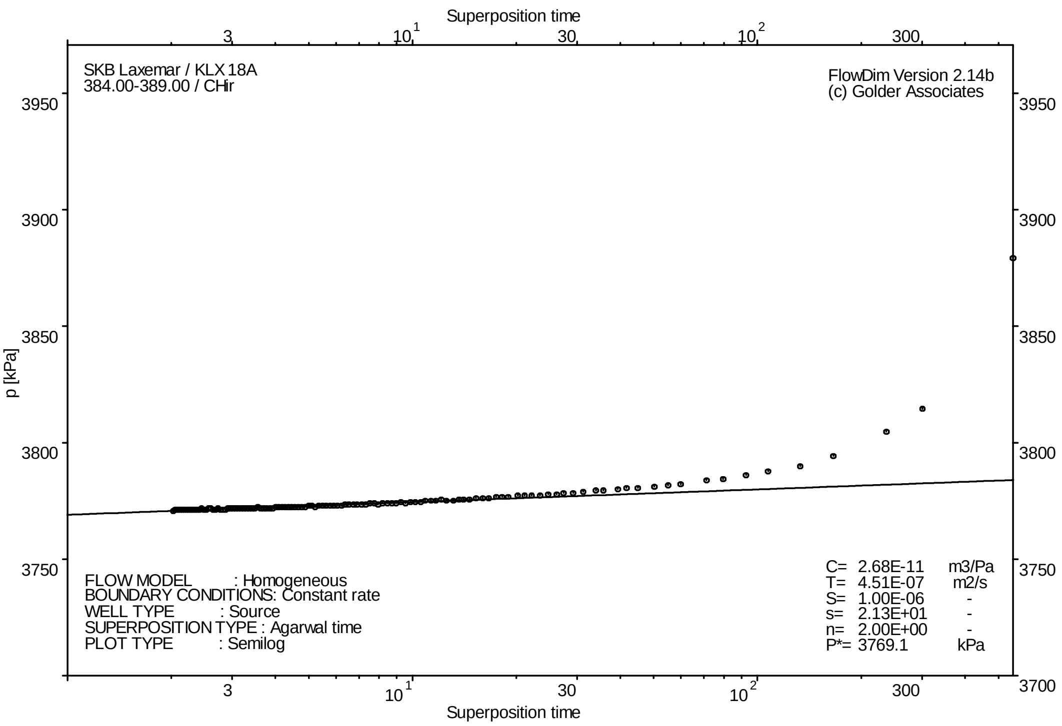
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

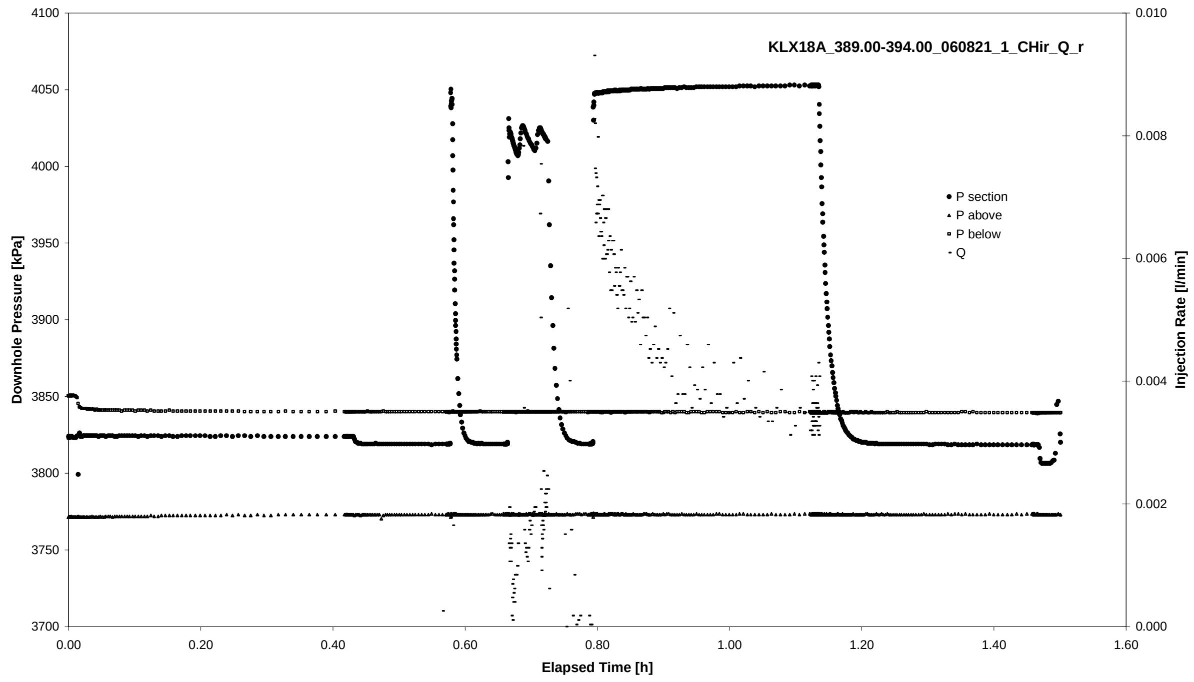


CHIR phase; HORNER match

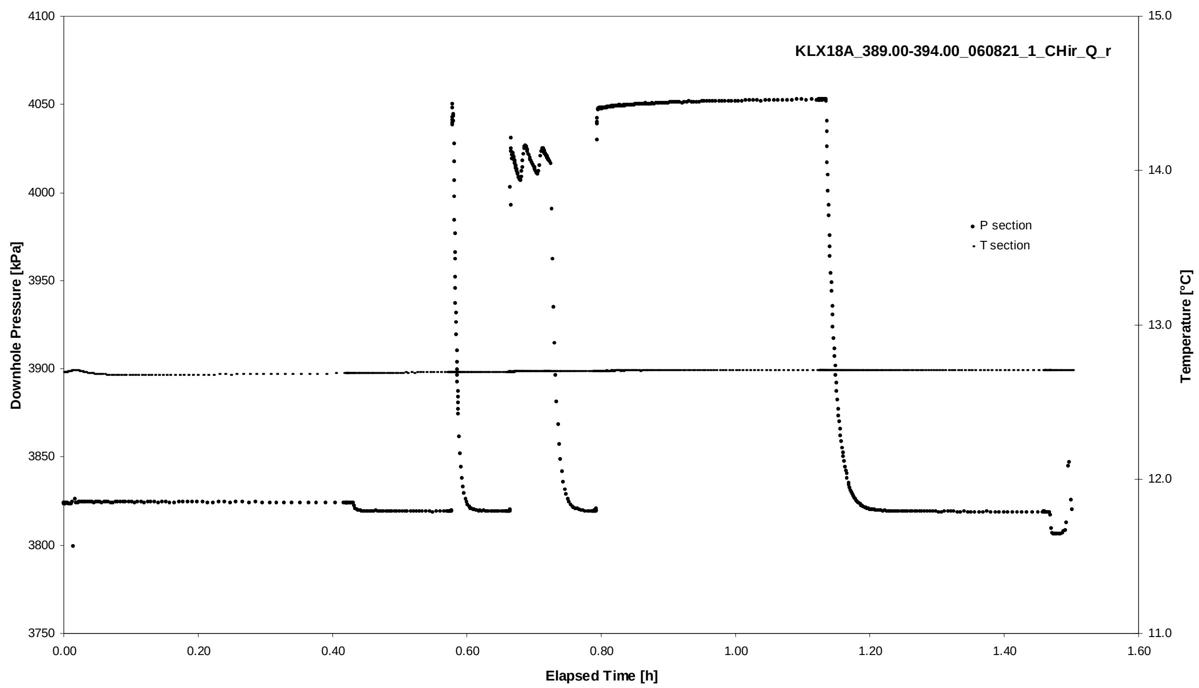
APPENDIX 2-49

Test 389.00 – 394.00 m

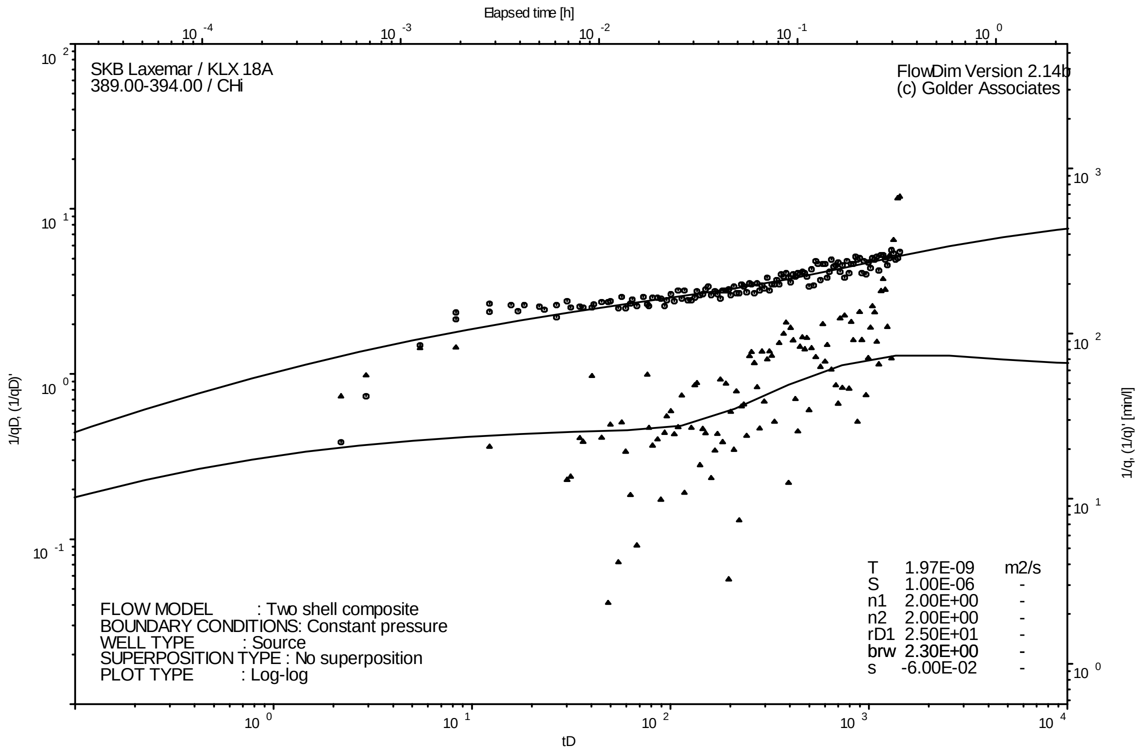
Analysis diagrams



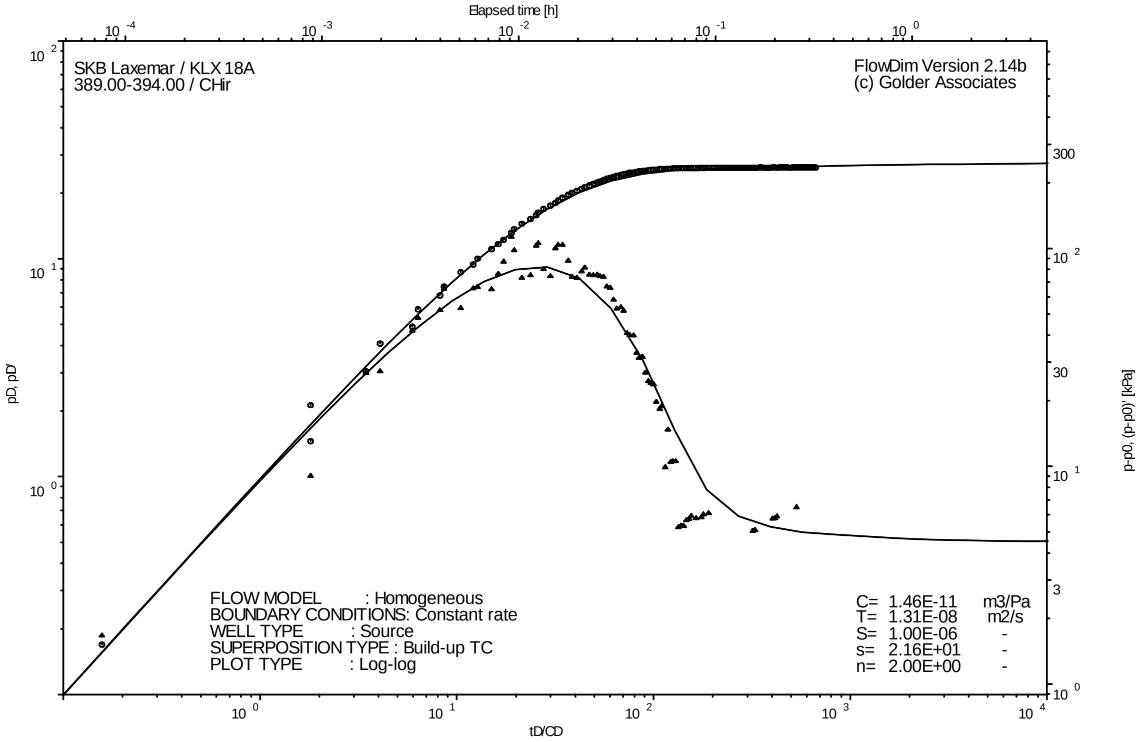
Pressure and flow rate vs. time; cartesian plot



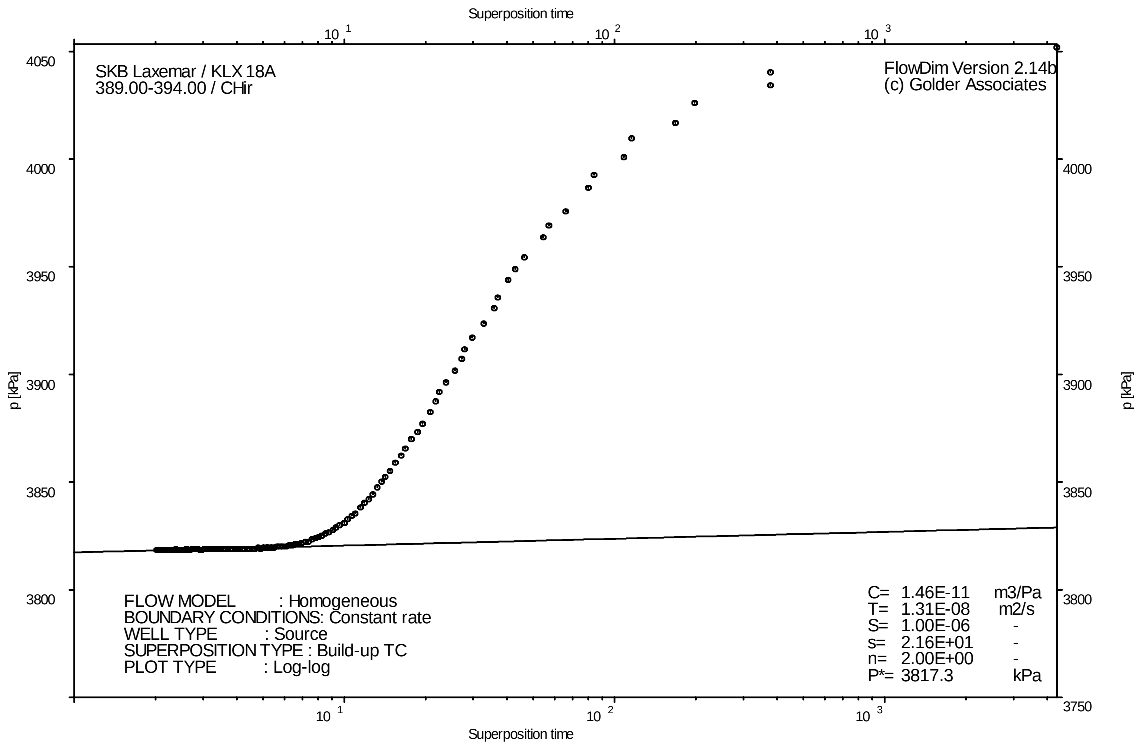
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

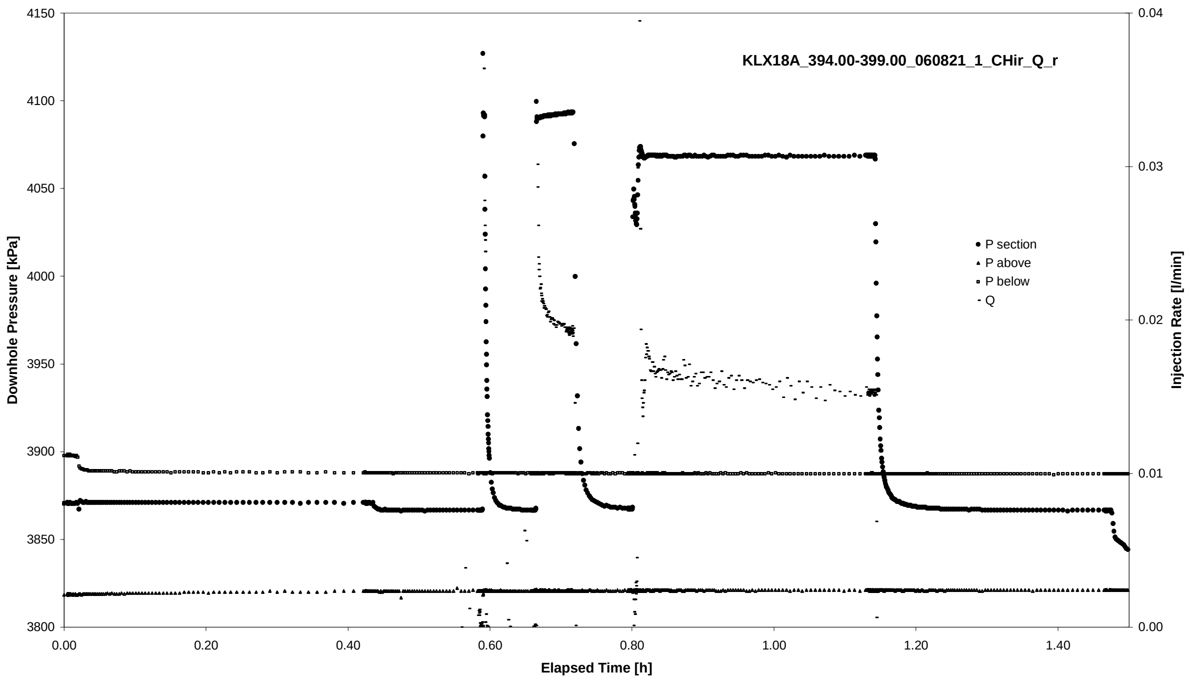


CHIR phase; HORNER match

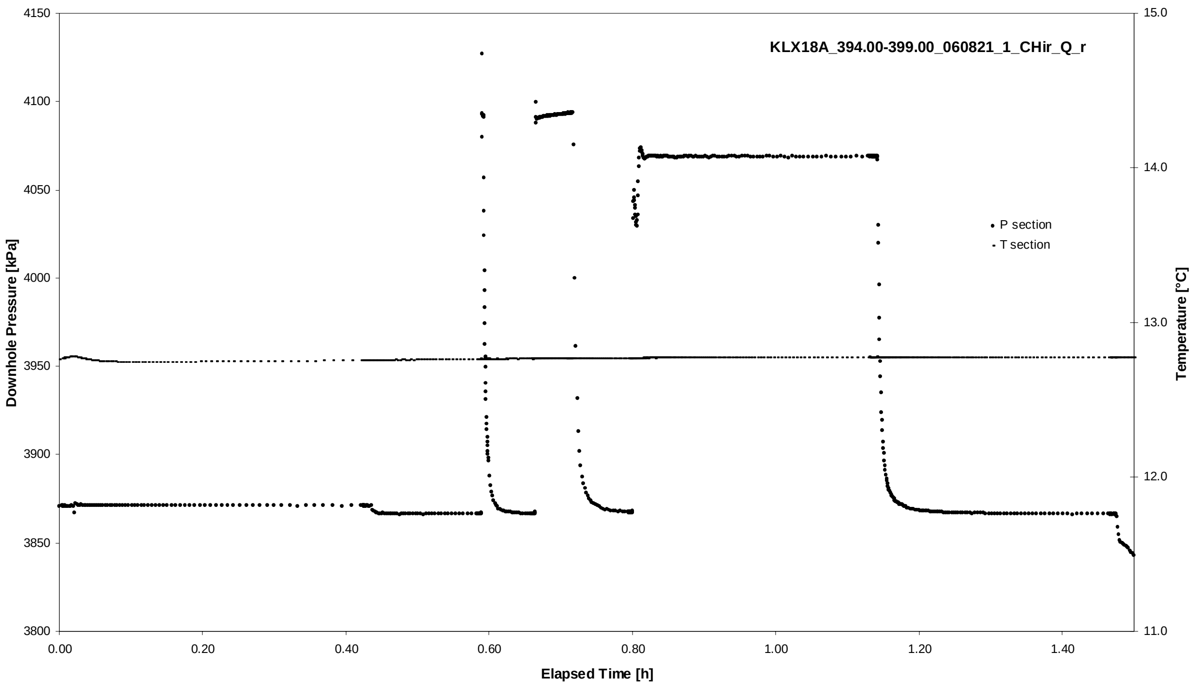
APPENDIX 2-50

Test 394.00 – 399.00 m

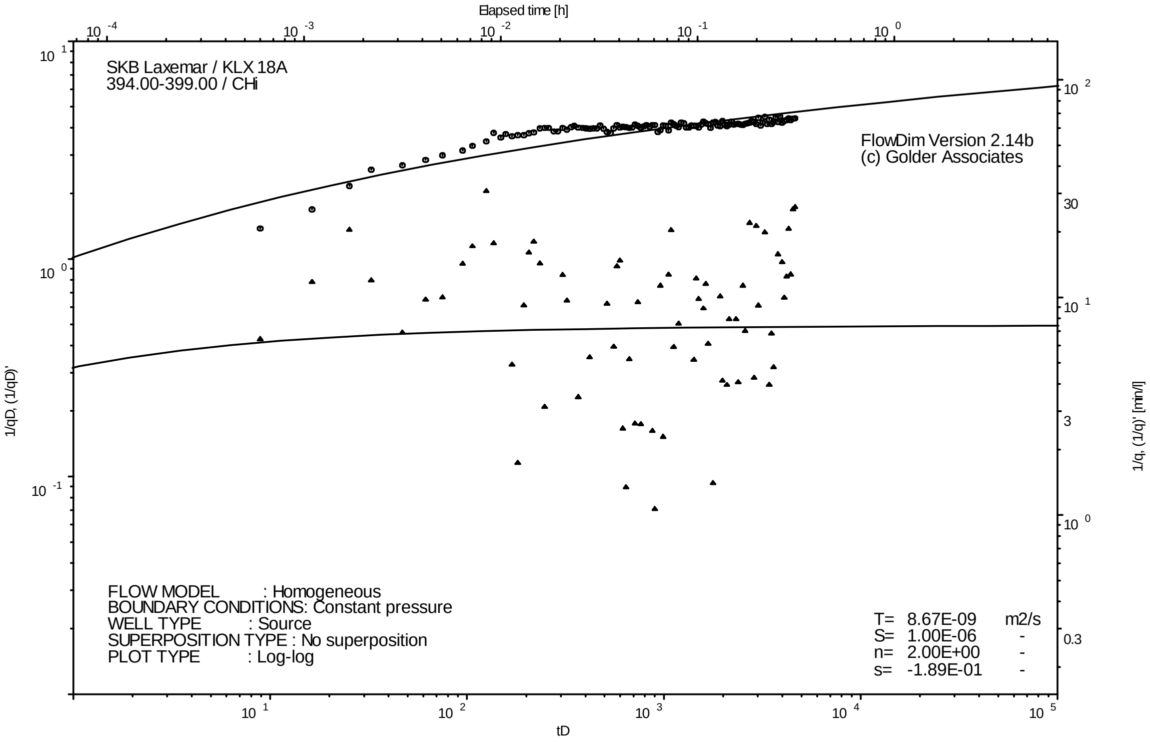
Analysis diagrams



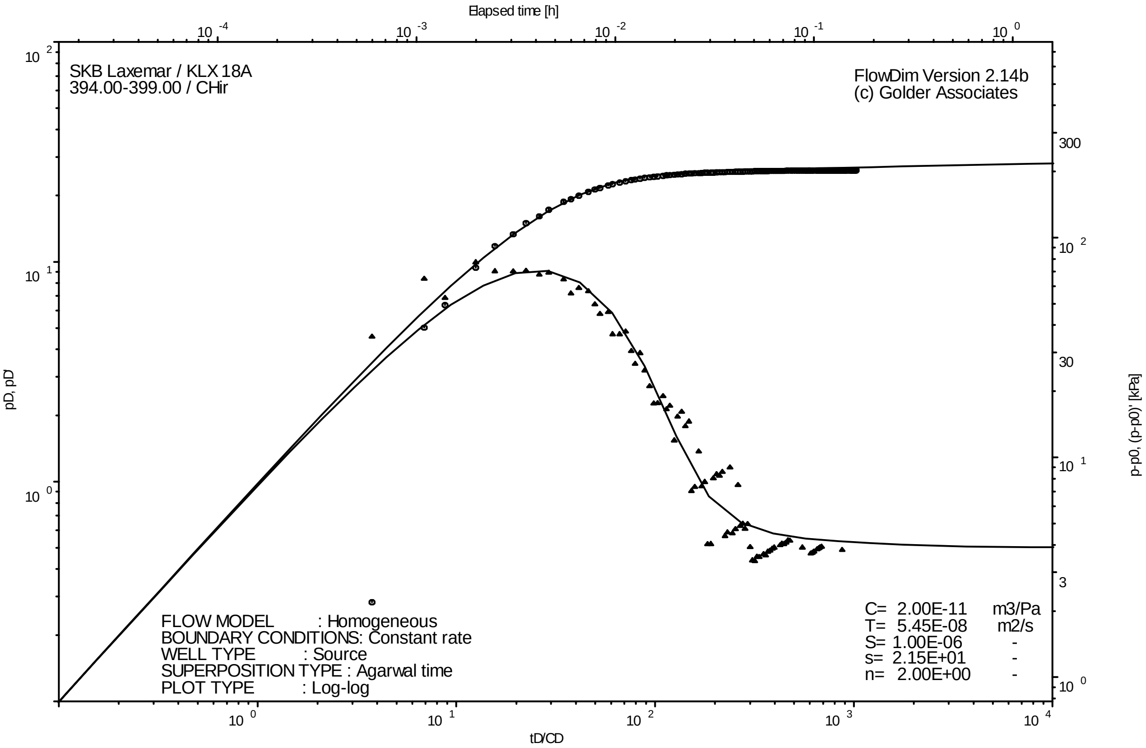
Pressure and flow rate vs. time; cartesian plot



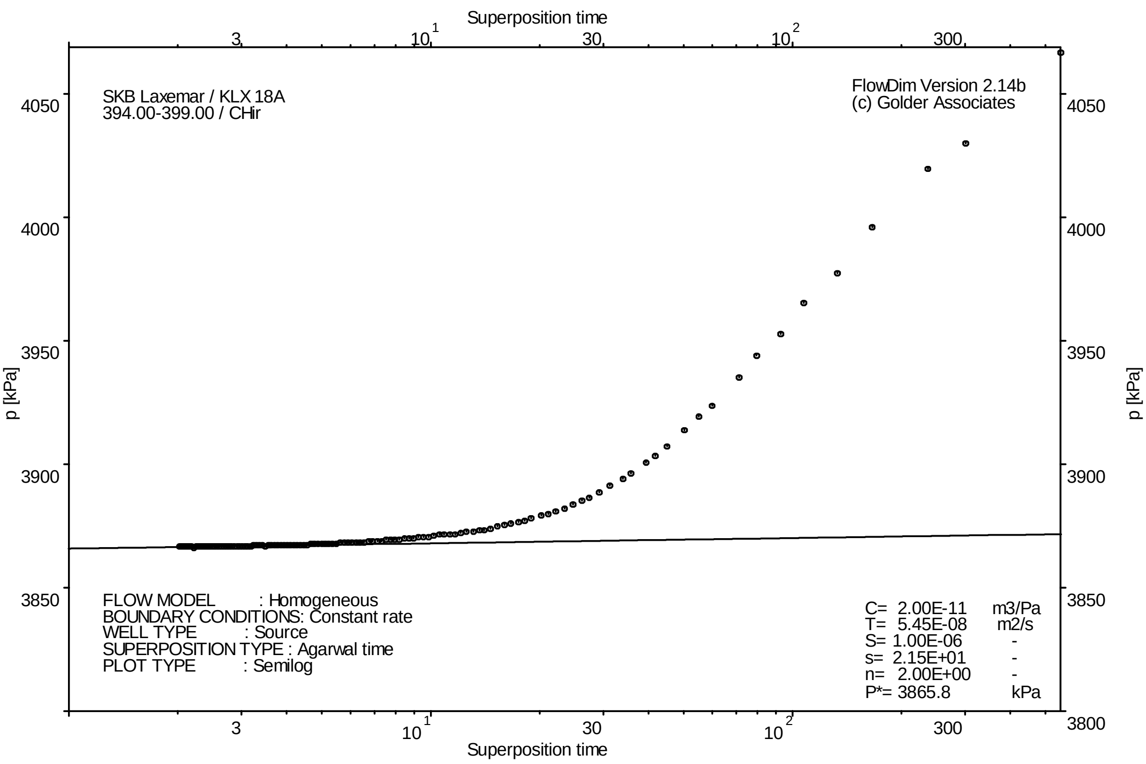
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

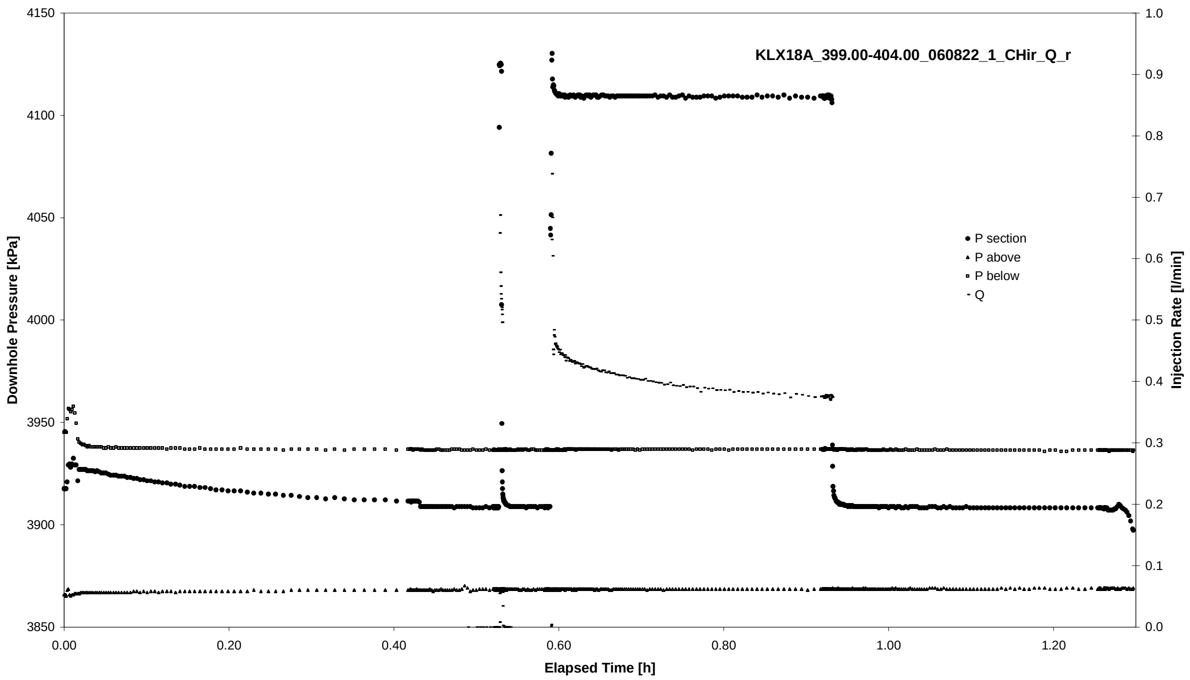


CHIR phase; HORNER match

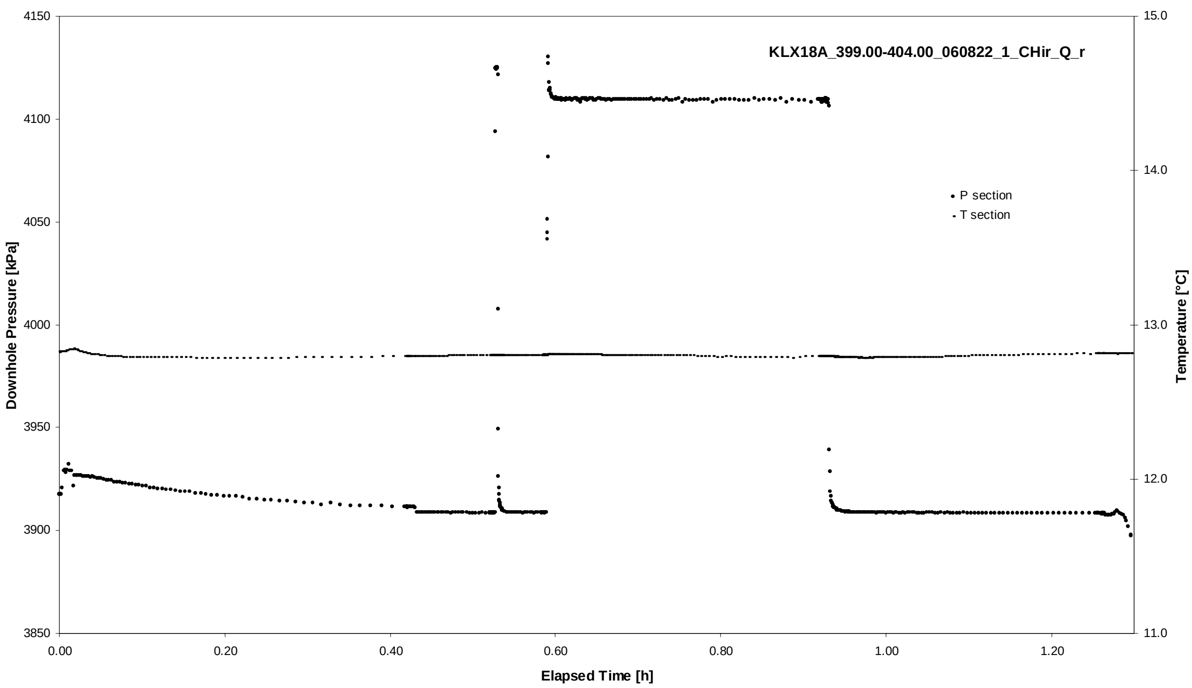
APPENDIX 2-51

Test 399.00 – 404.00 m

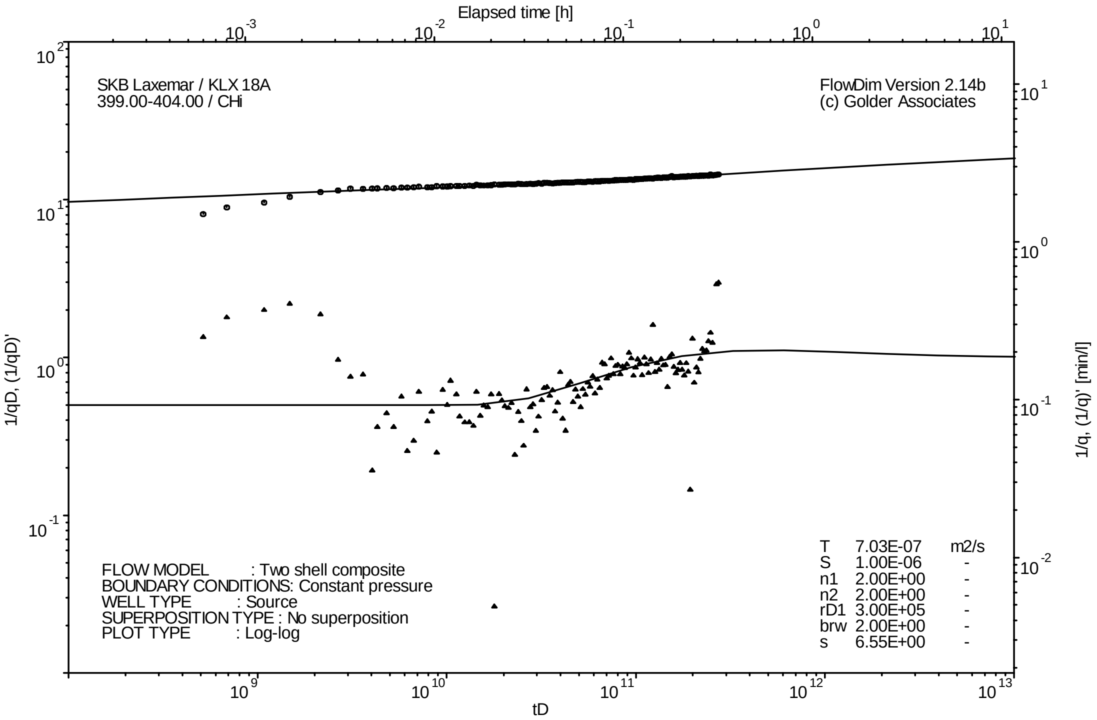
Analysis diagrams



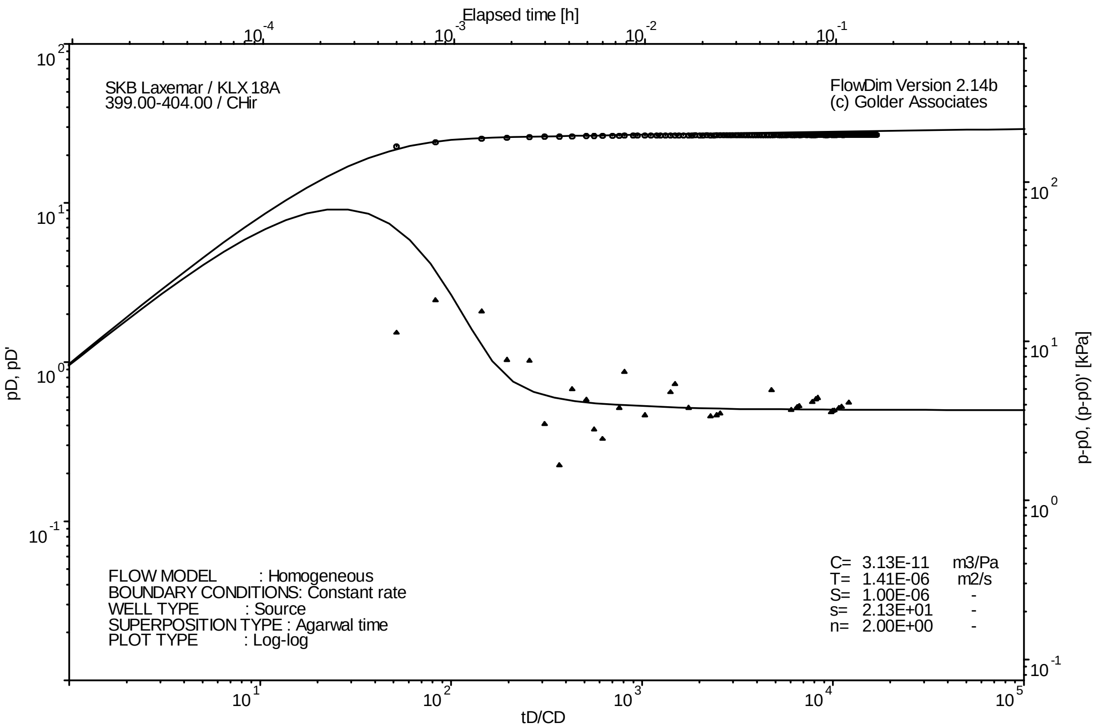
Pressure and flow rate vs. time; cartesian plot



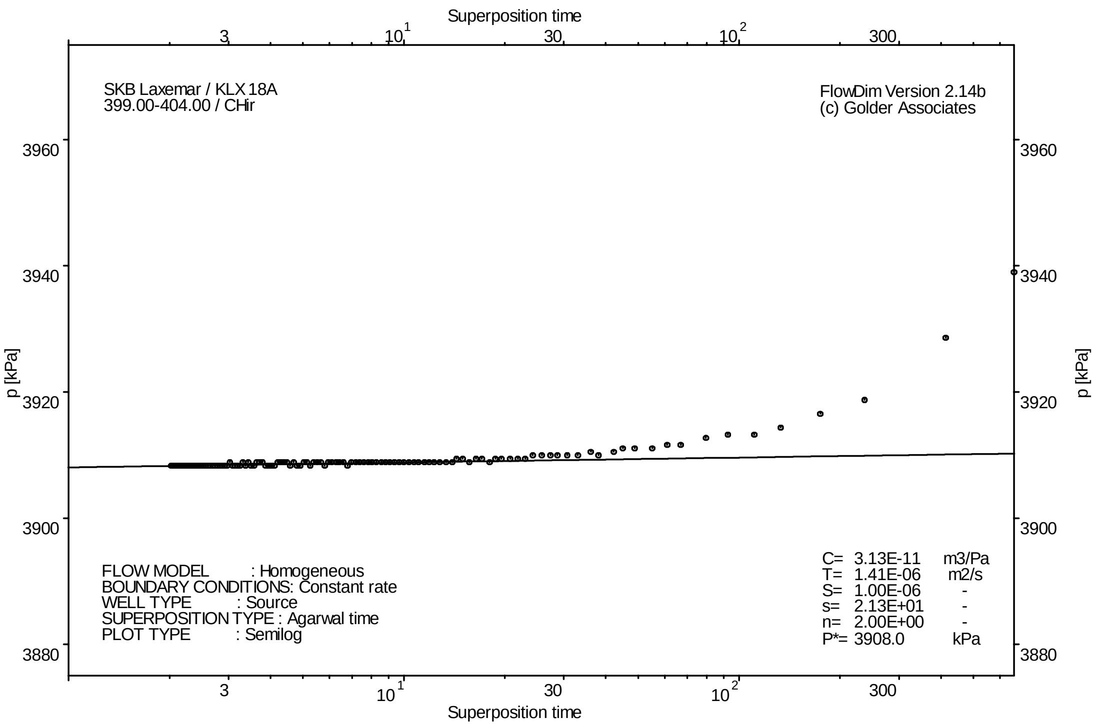
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

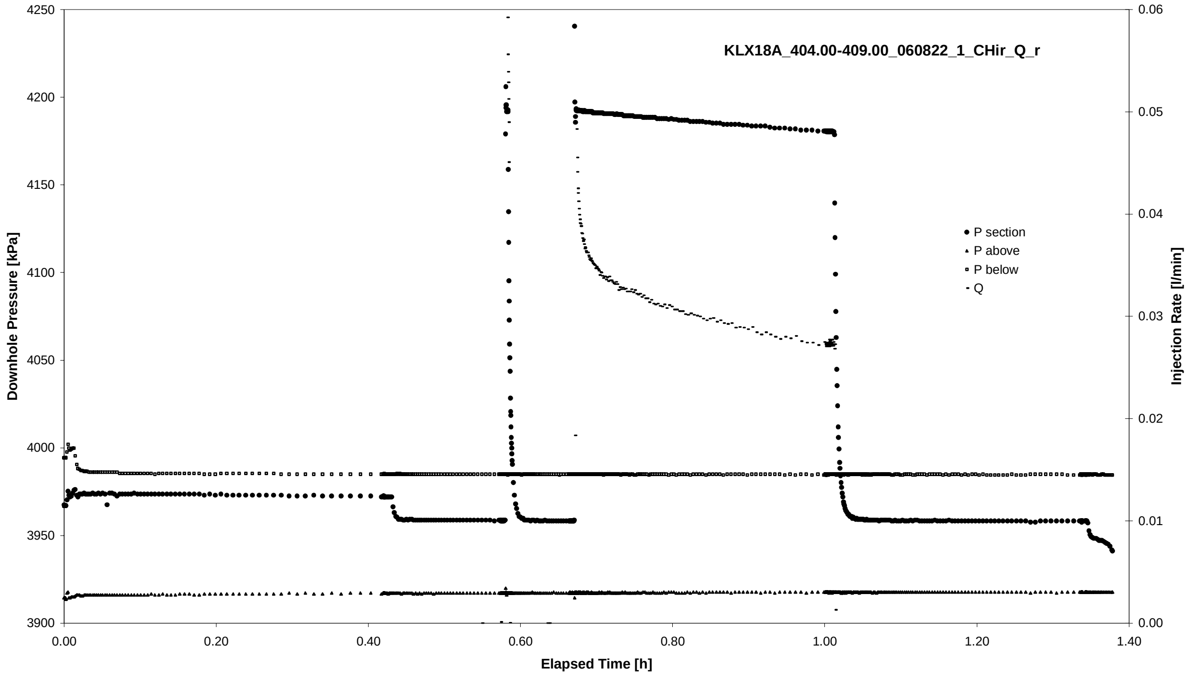


CHIR phase; HORNER match

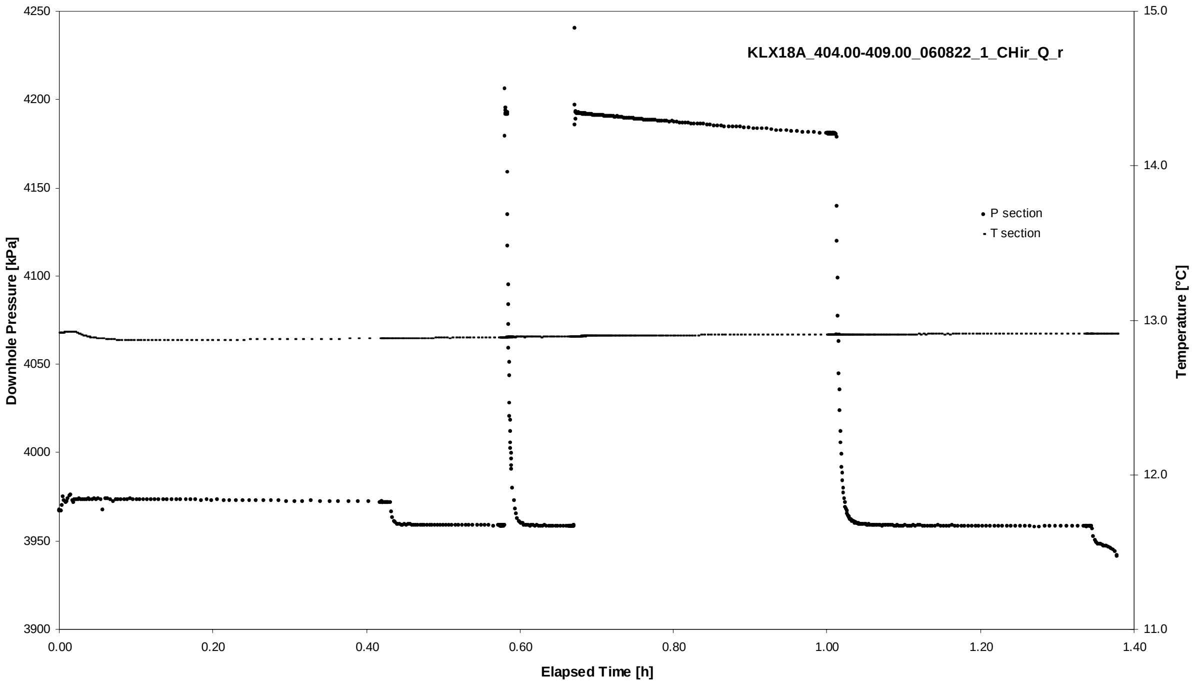
APPENDIX 2-52

Test 404.00 – 409.00 m

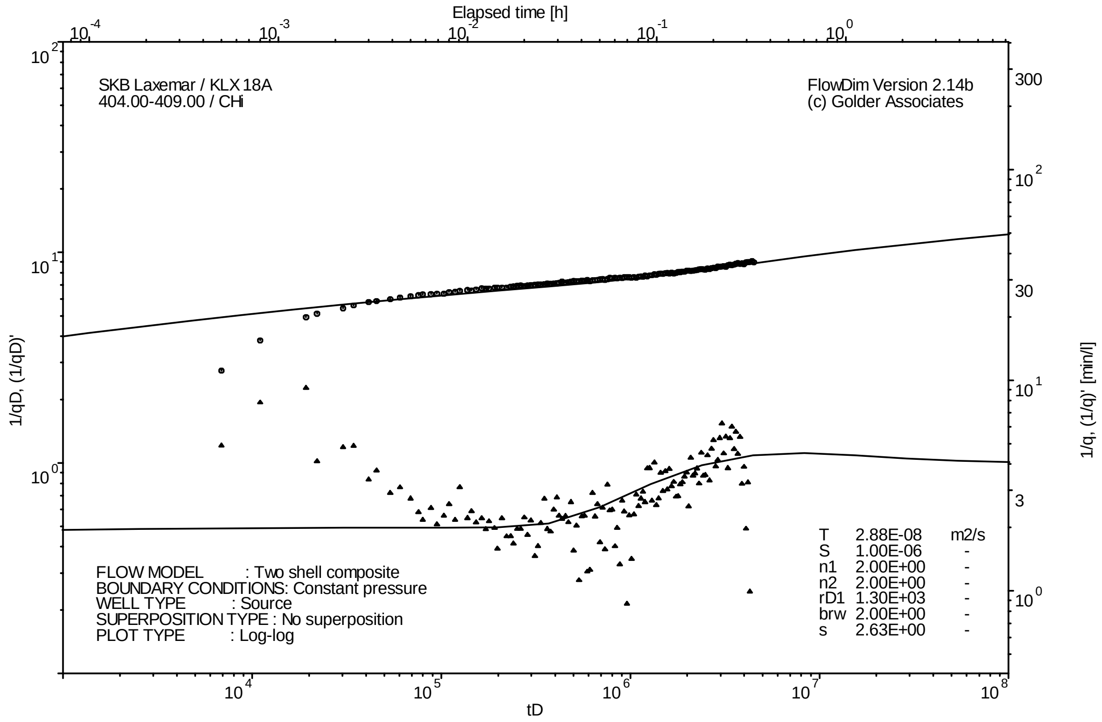
Analysis diagrams



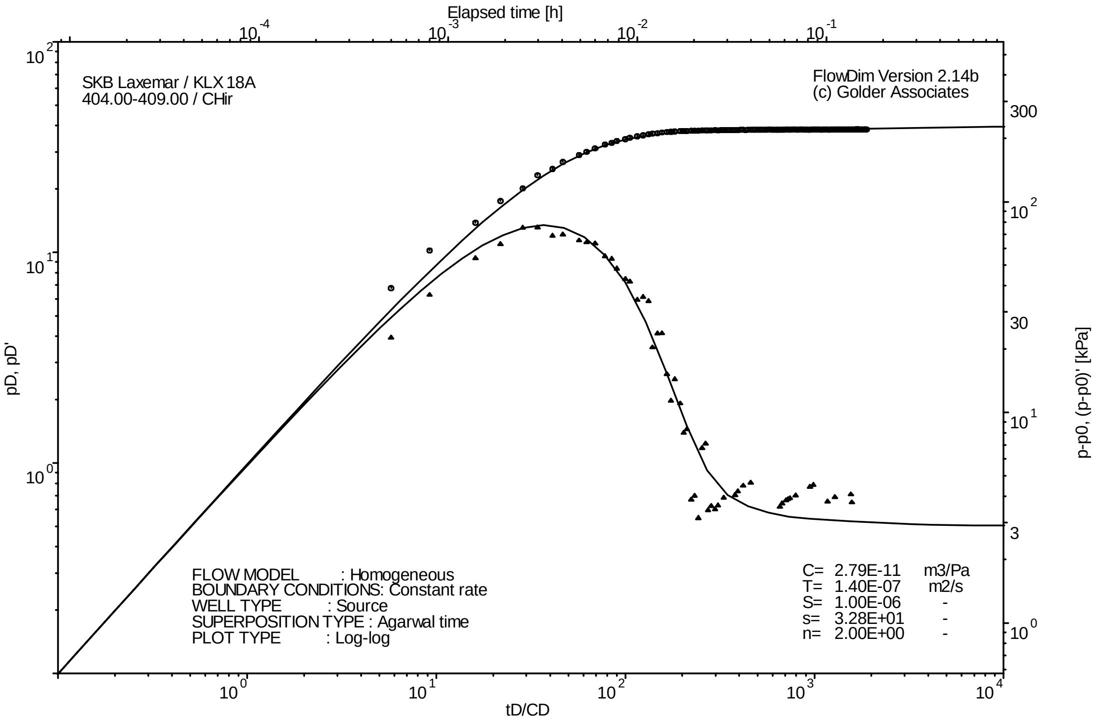
Pressure and flow rate vs. time; cartesian plot



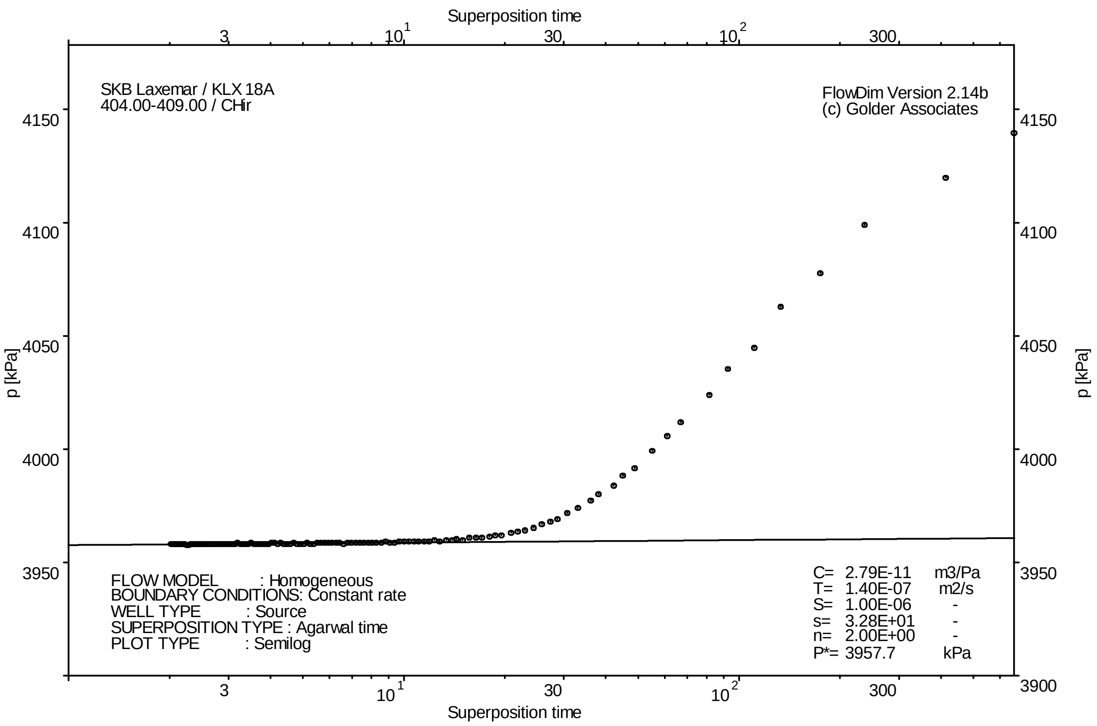
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

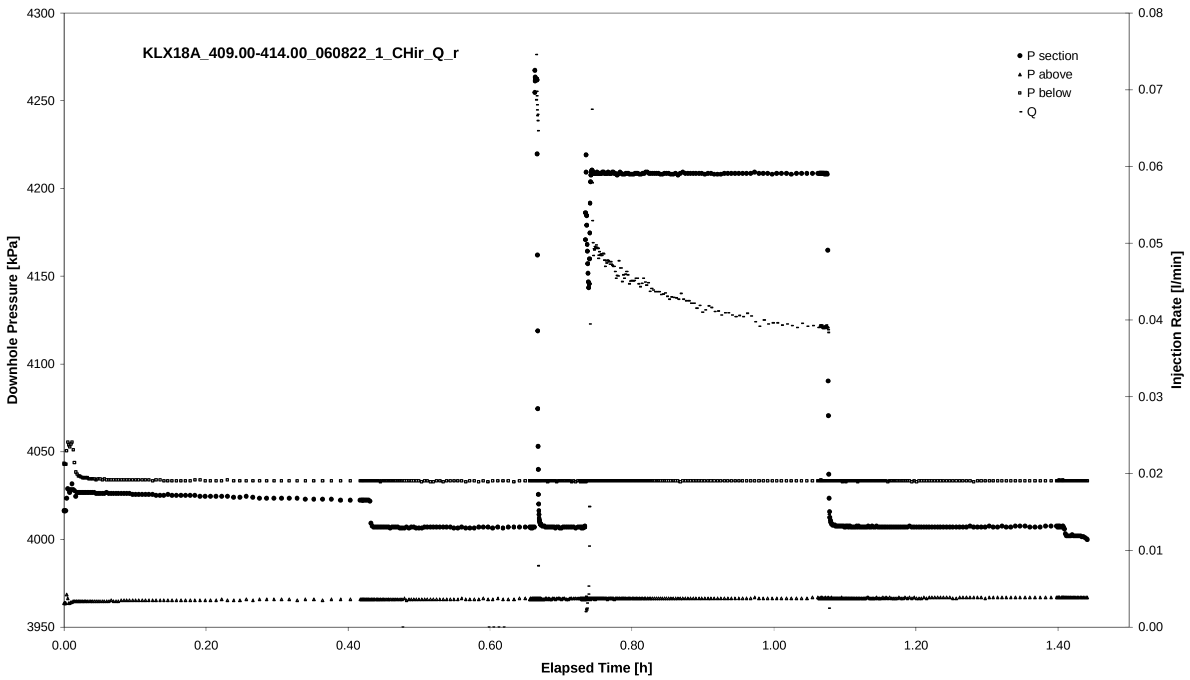


CHIR phase; HORNER match

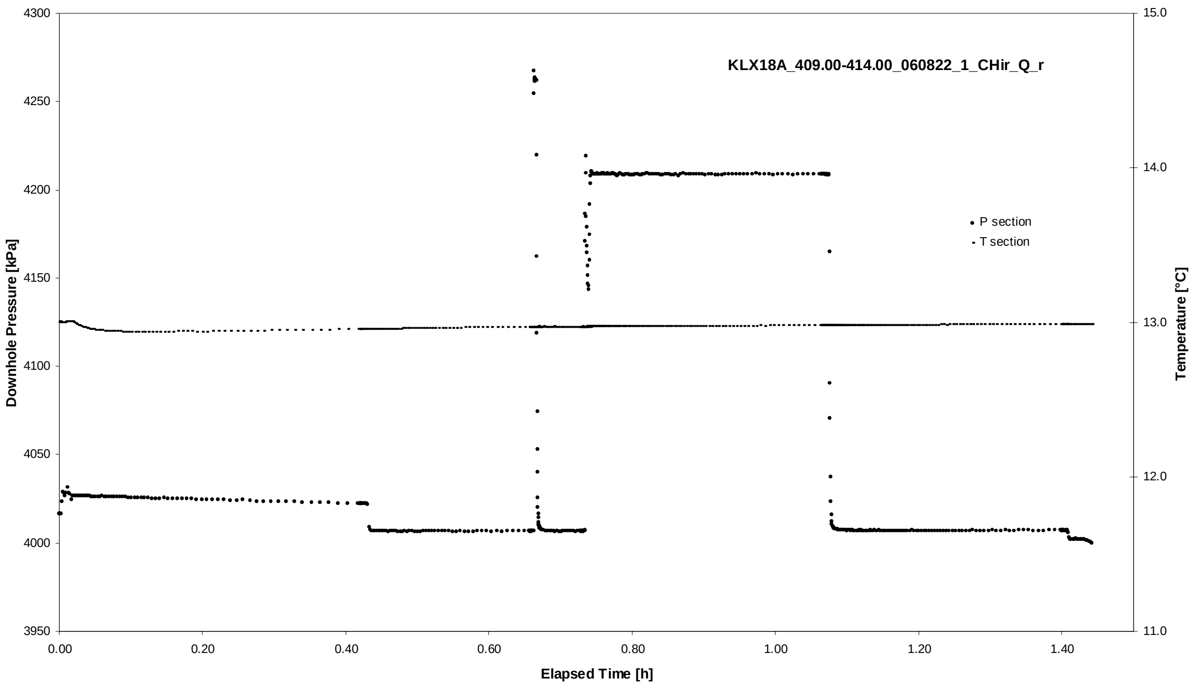
APPENDIX 2-53

Test 409.00 – 414.00 m

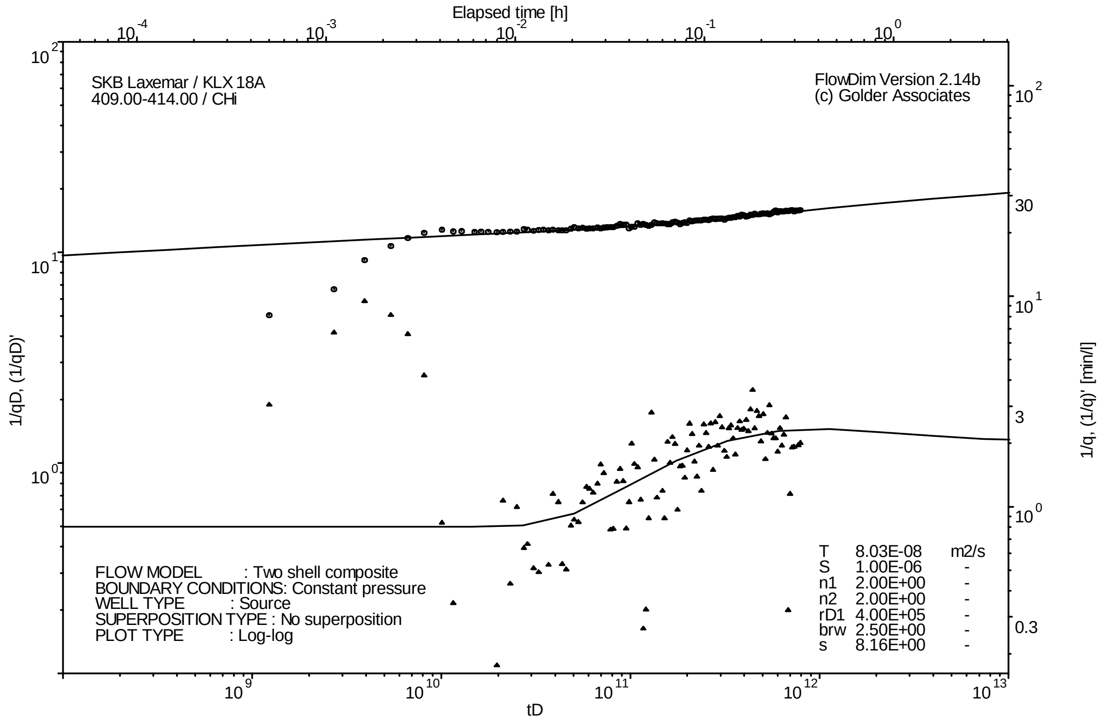
Analysis diagrams



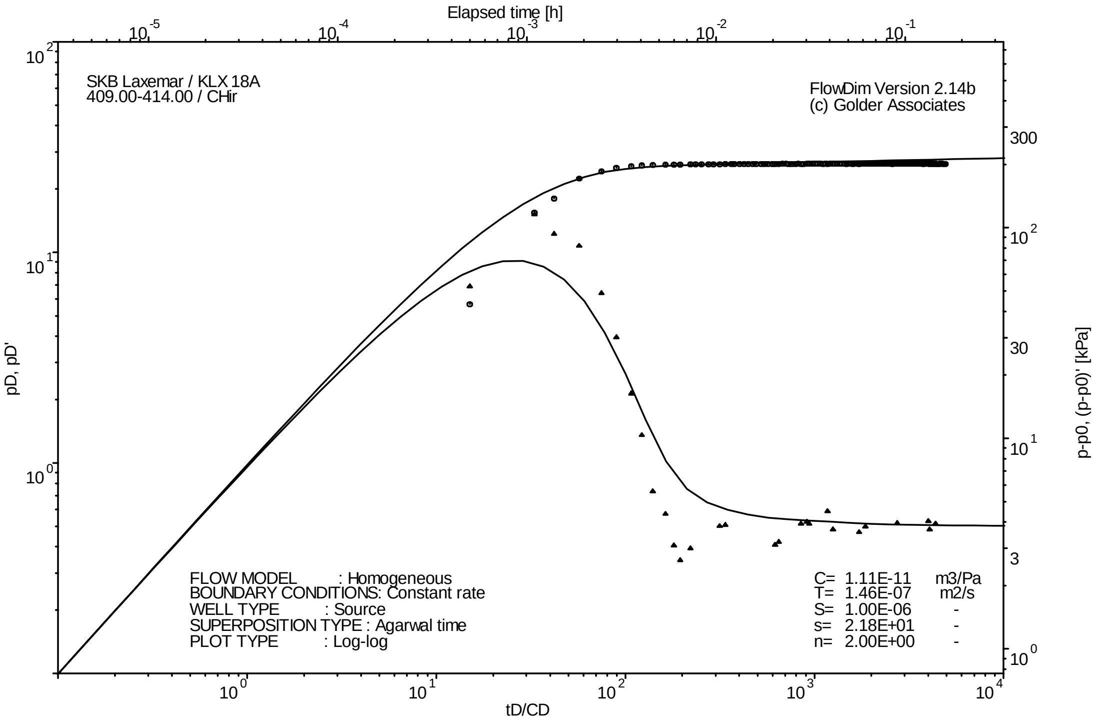
Pressure and flow rate vs. time; cartesian plot



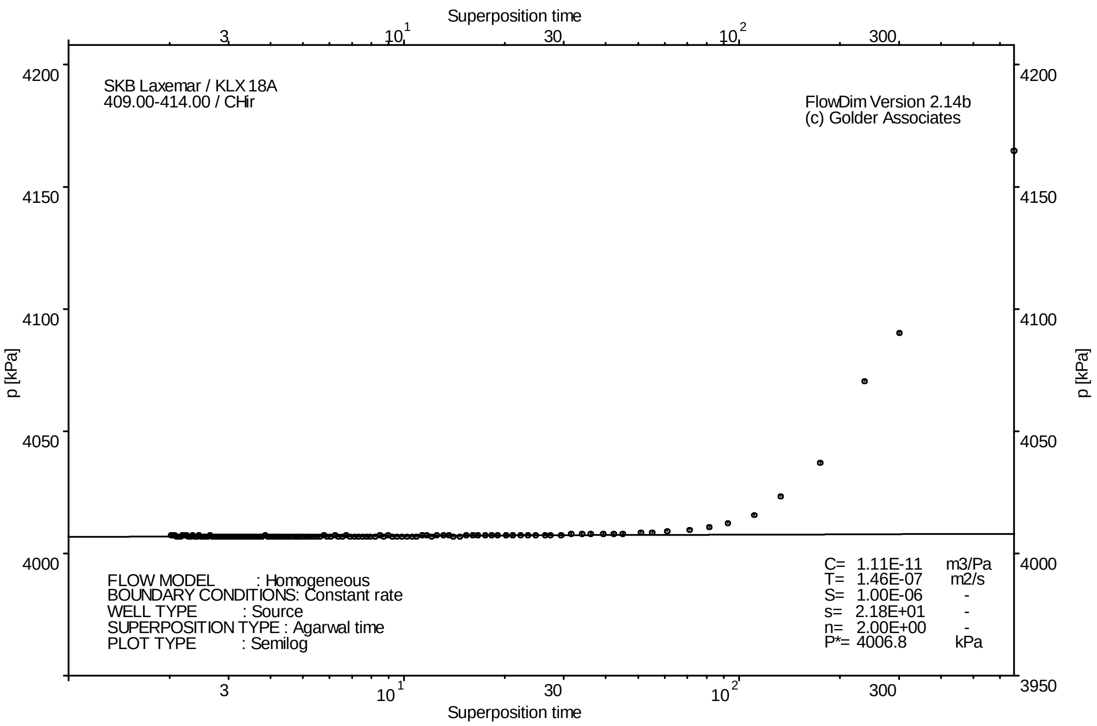
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

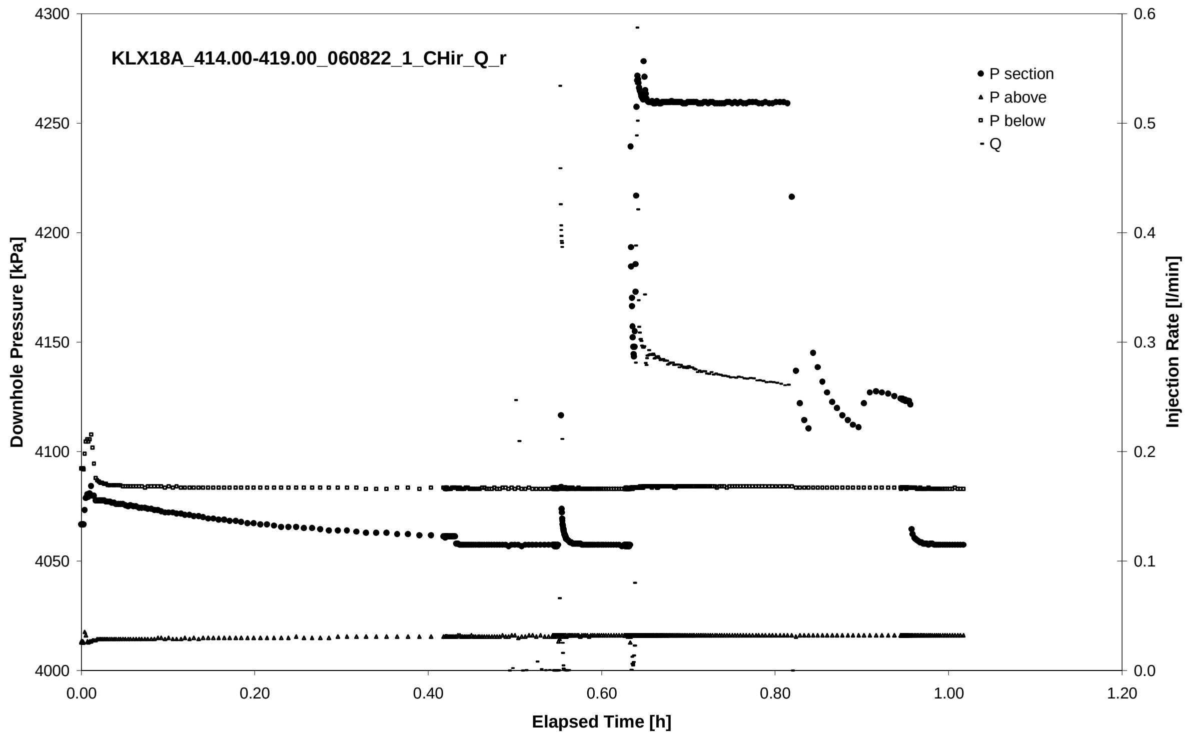


CHIR phase; HORNER match

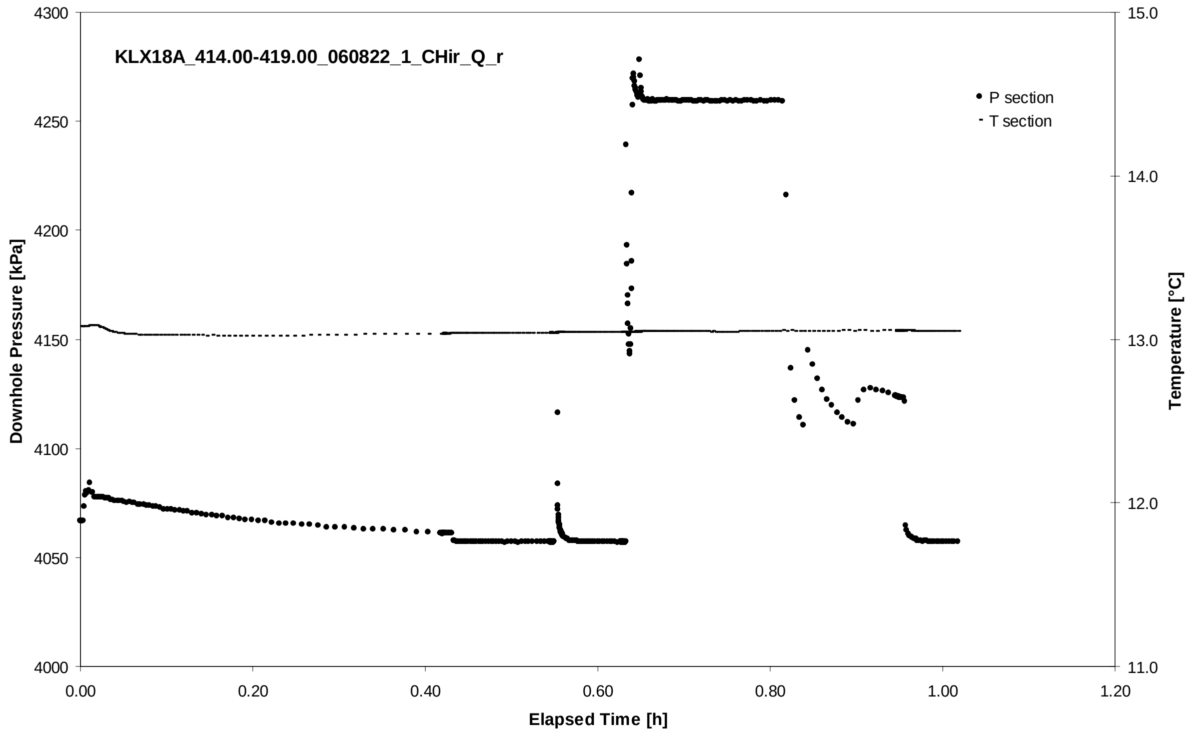
APPENDIX 2-54

Test 414.00 – 419.00 m

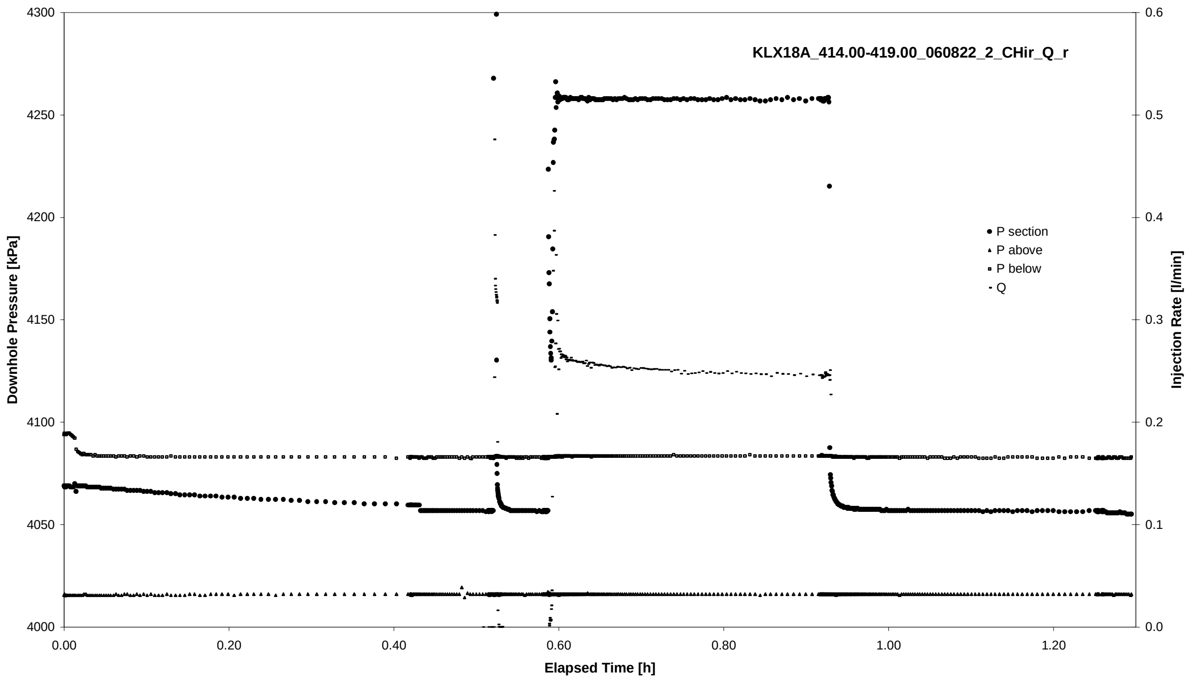
Analysis diagrams



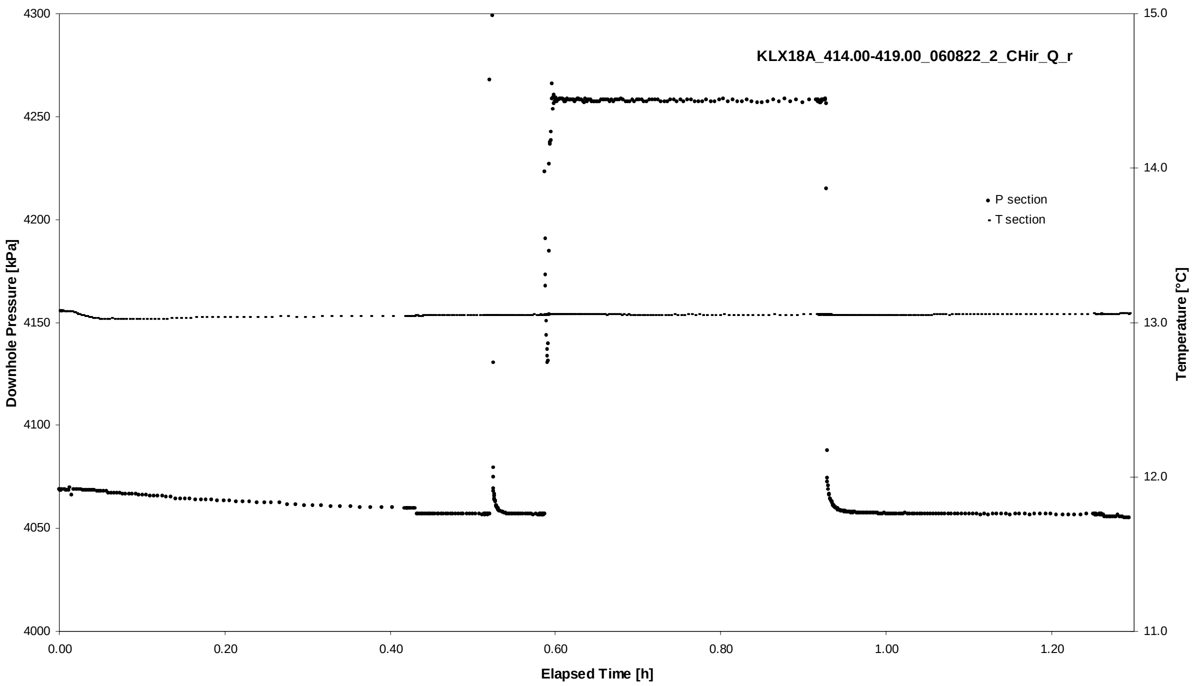
Pressure and flow rate vs. time; cartesian plot (test repeated)



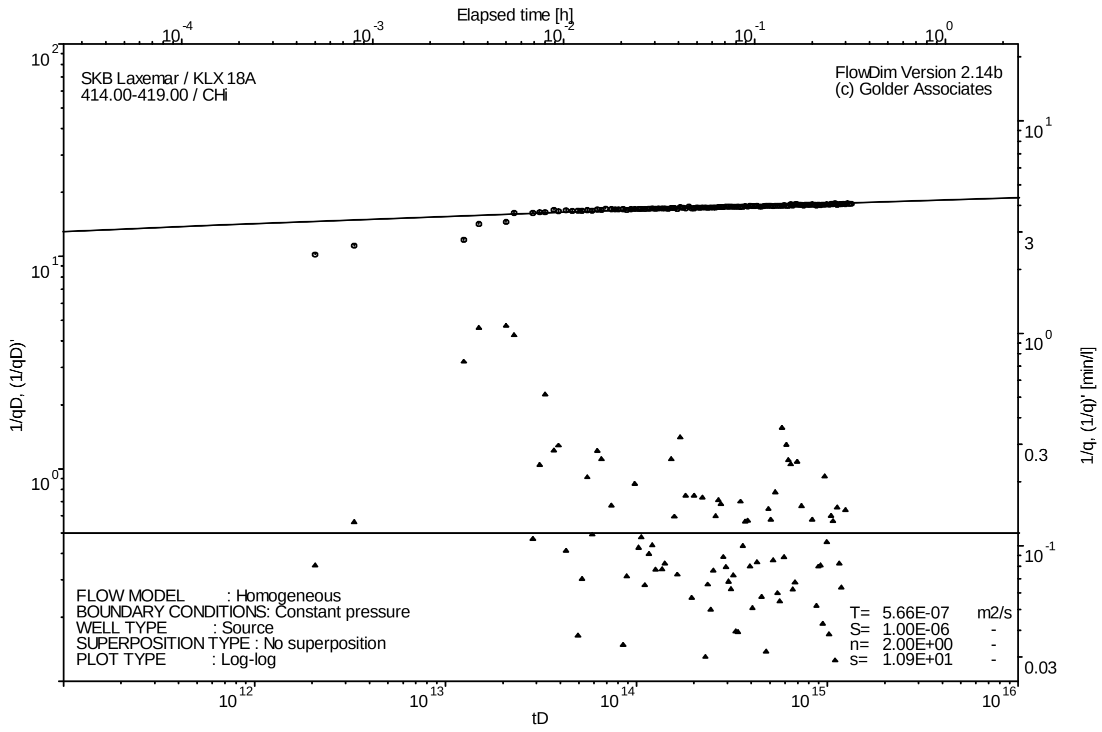
Interval pressure and temperature vs. time; cartesian plot (test repeated)



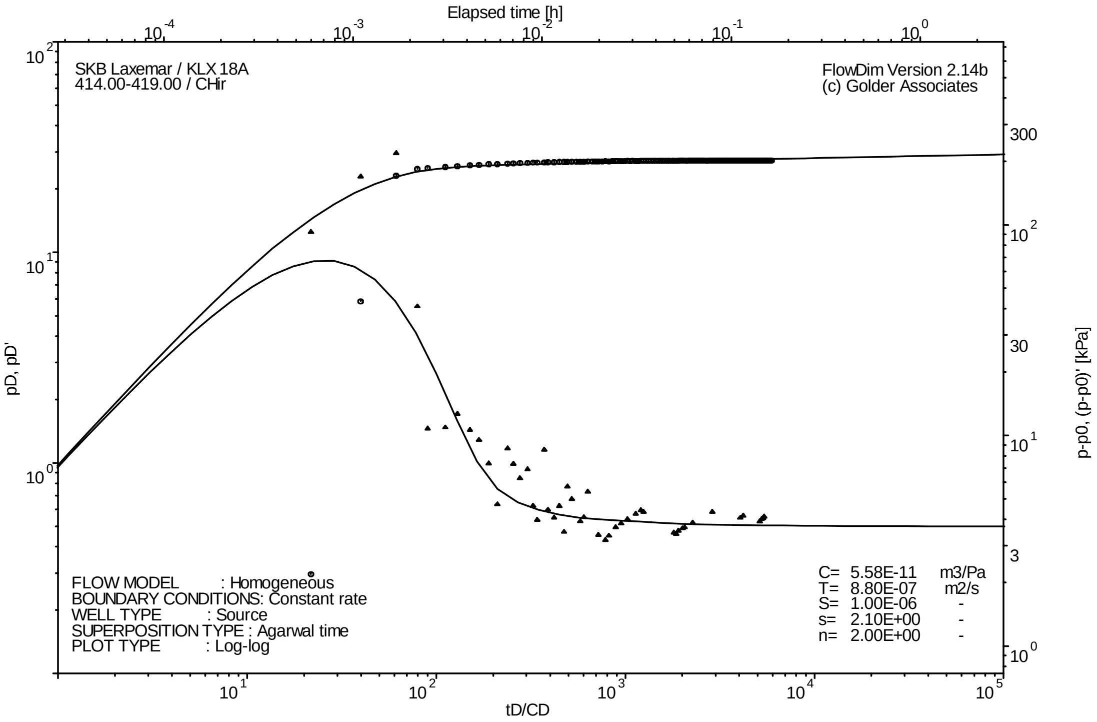
Pressure and flow rate vs. time; cartesian plot



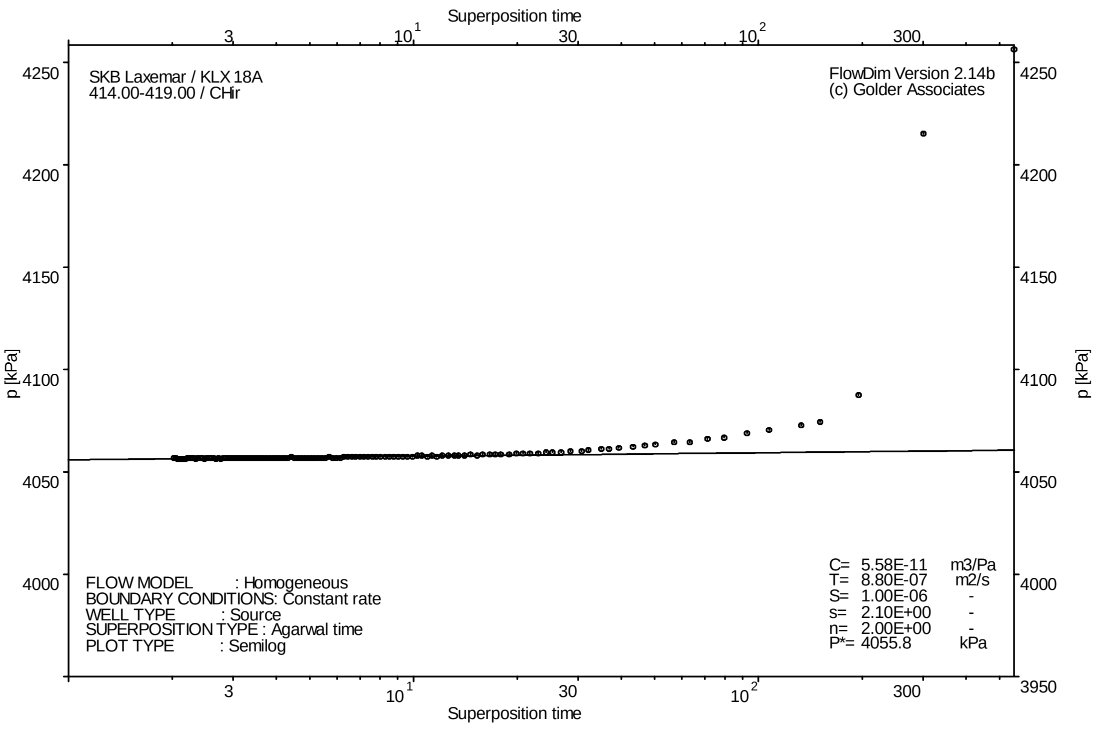
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

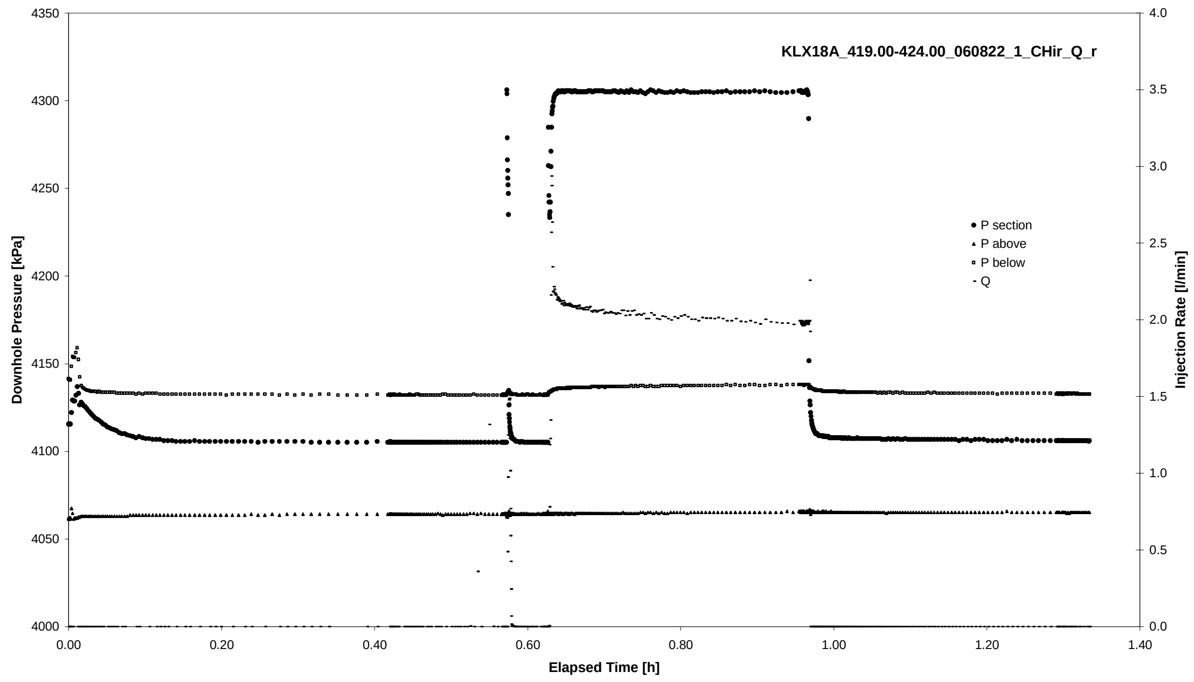


CHIR phase; HORNER match

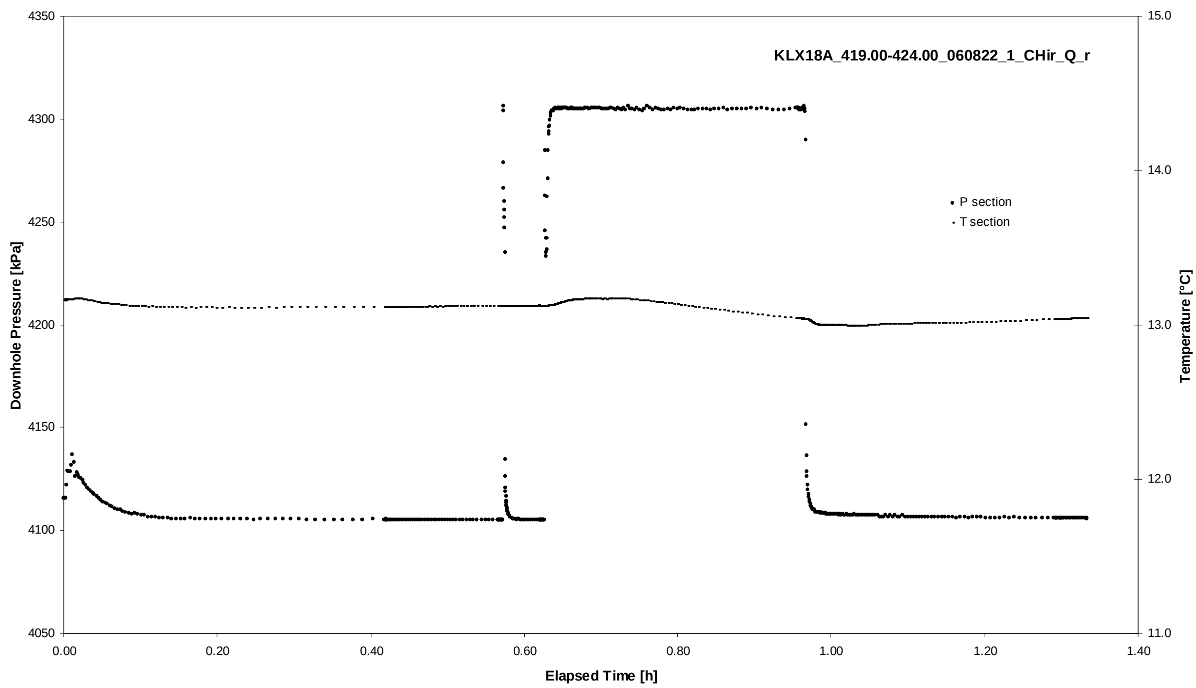
APPENDIX 2-55

Test 419.00 – 424.00 m

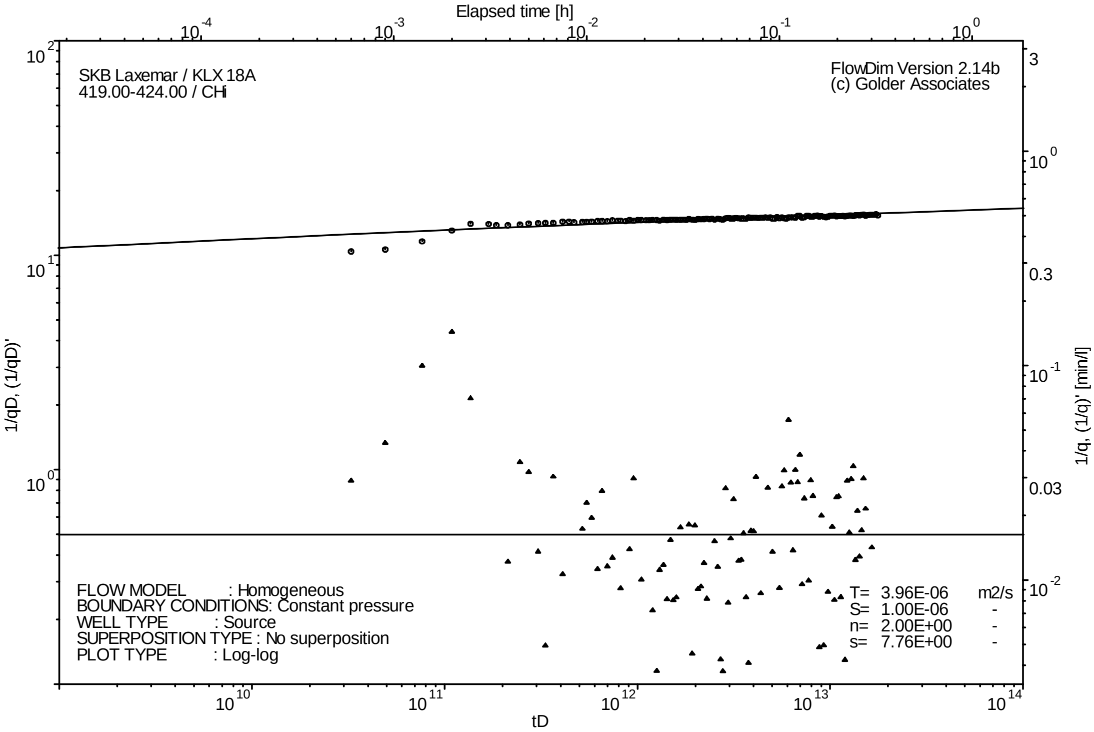
Analysis diagrams



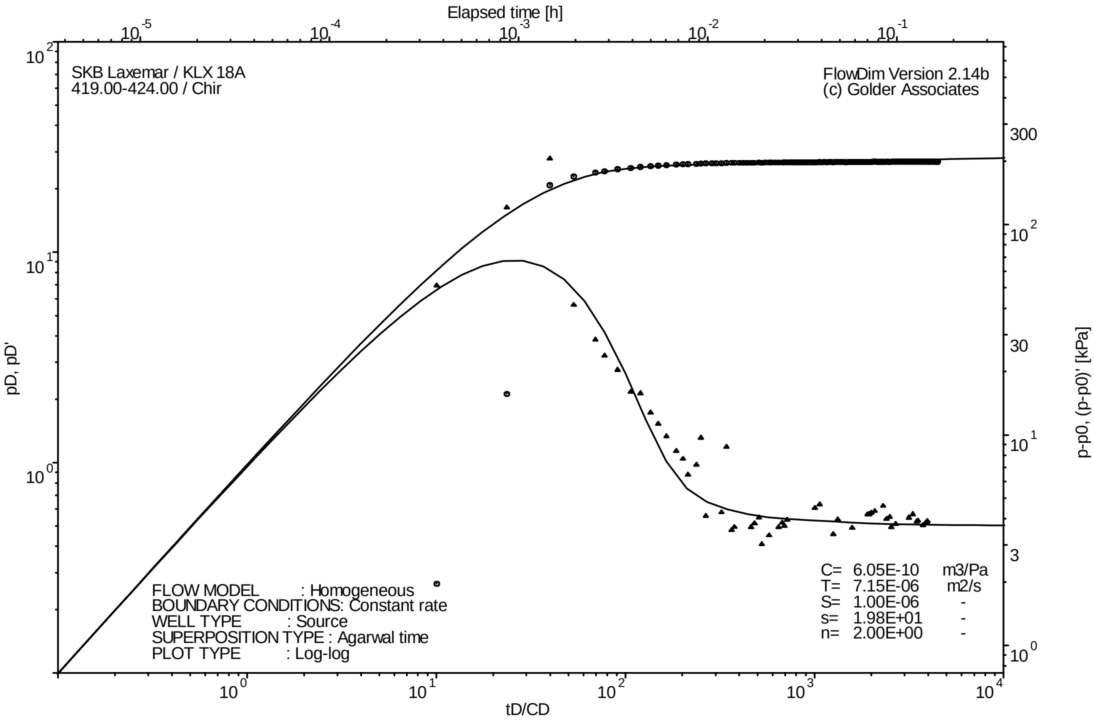
Pressure and flow rate vs. time; cartesian plot



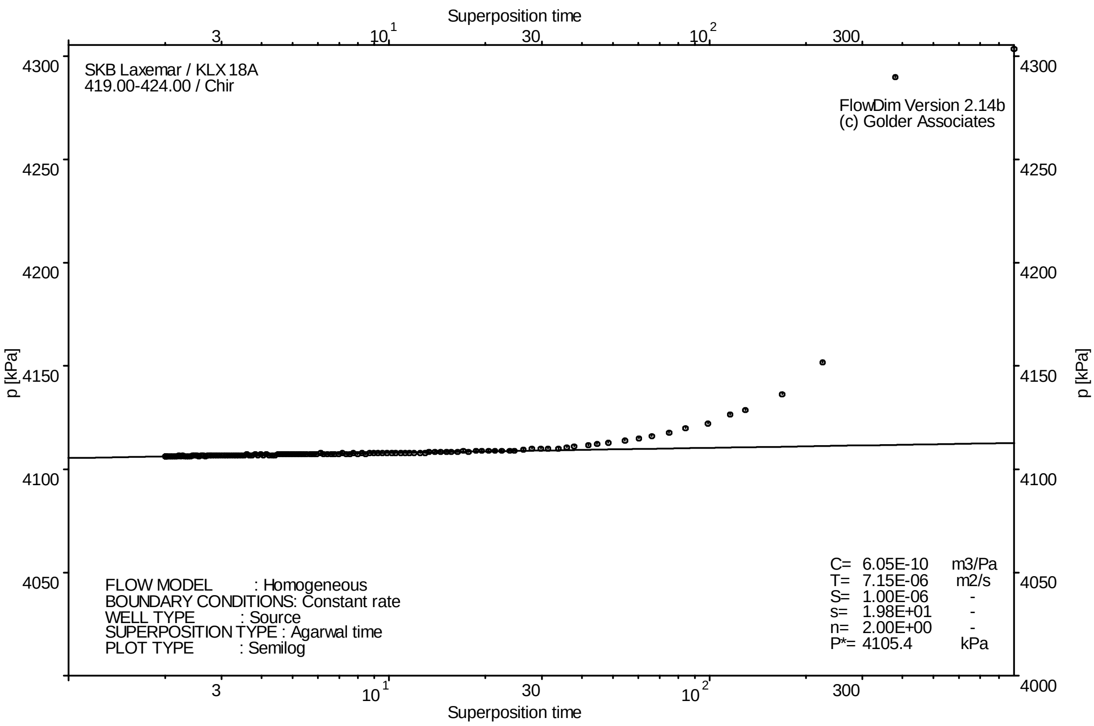
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

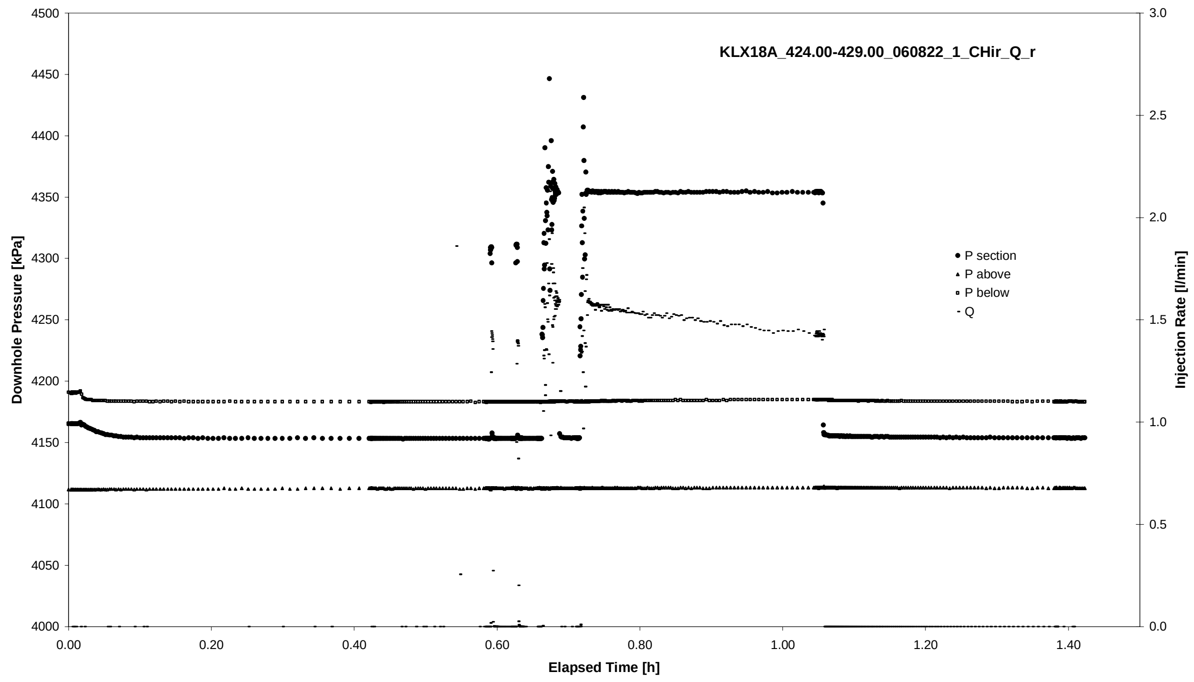


CHIR phase; HORNER match

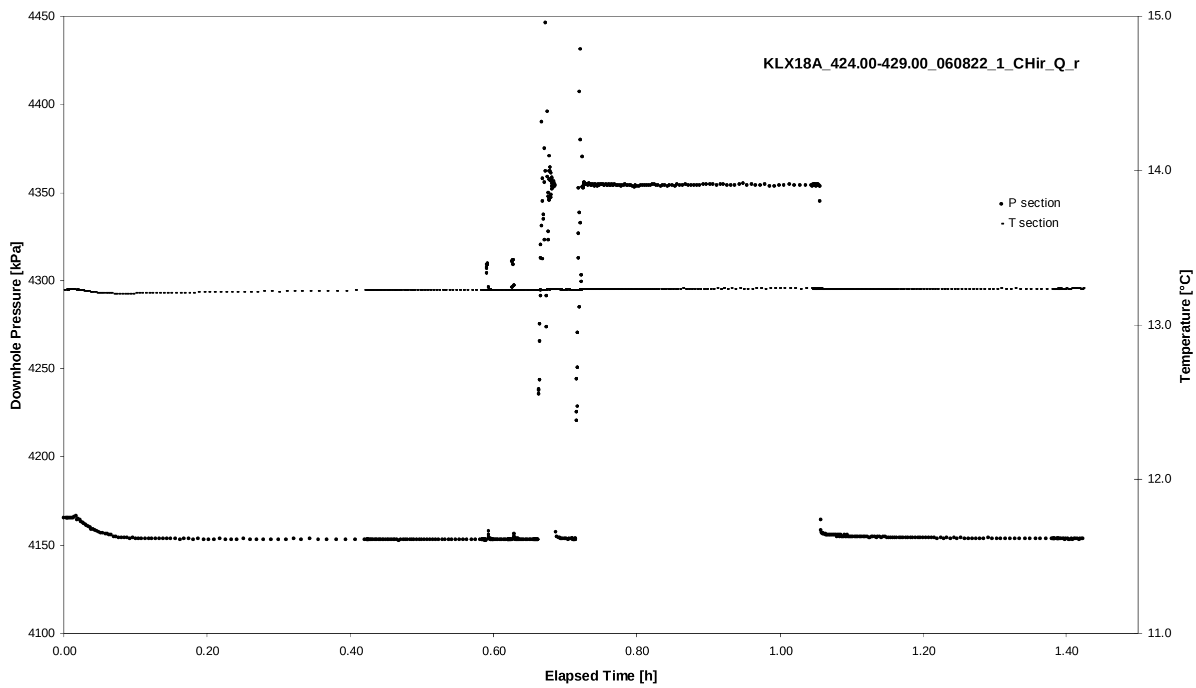
APPENDIX 2-56

Test 424.00 – 429.00 m

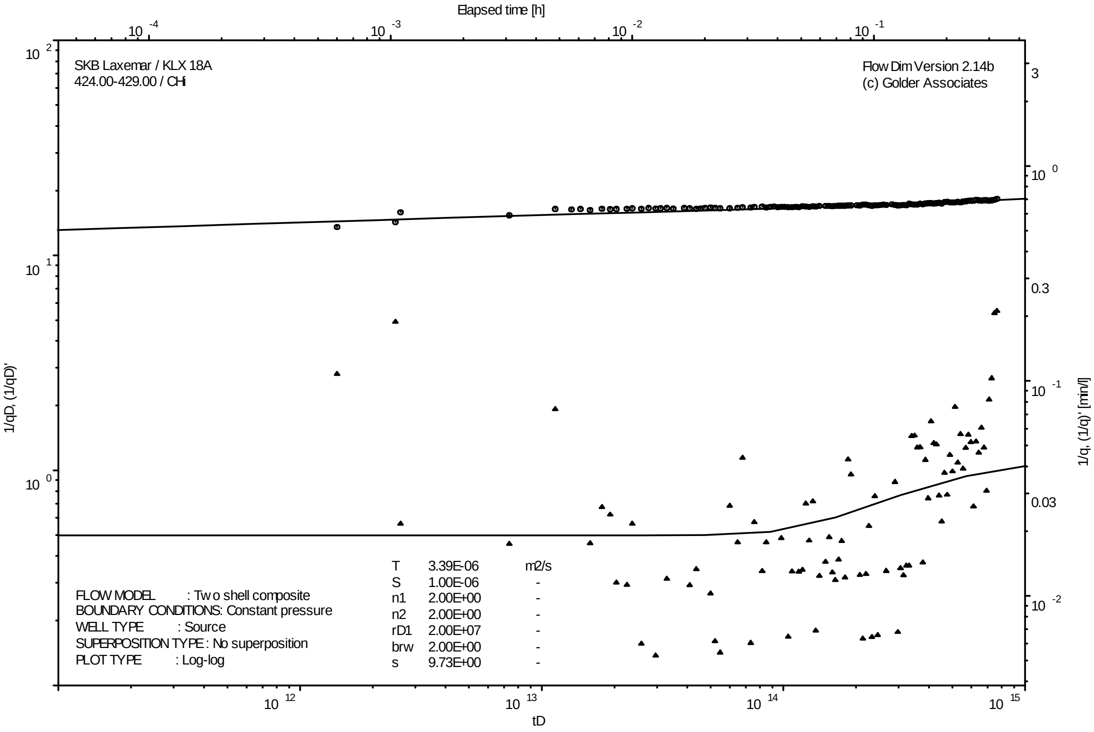
Analysis diagrams



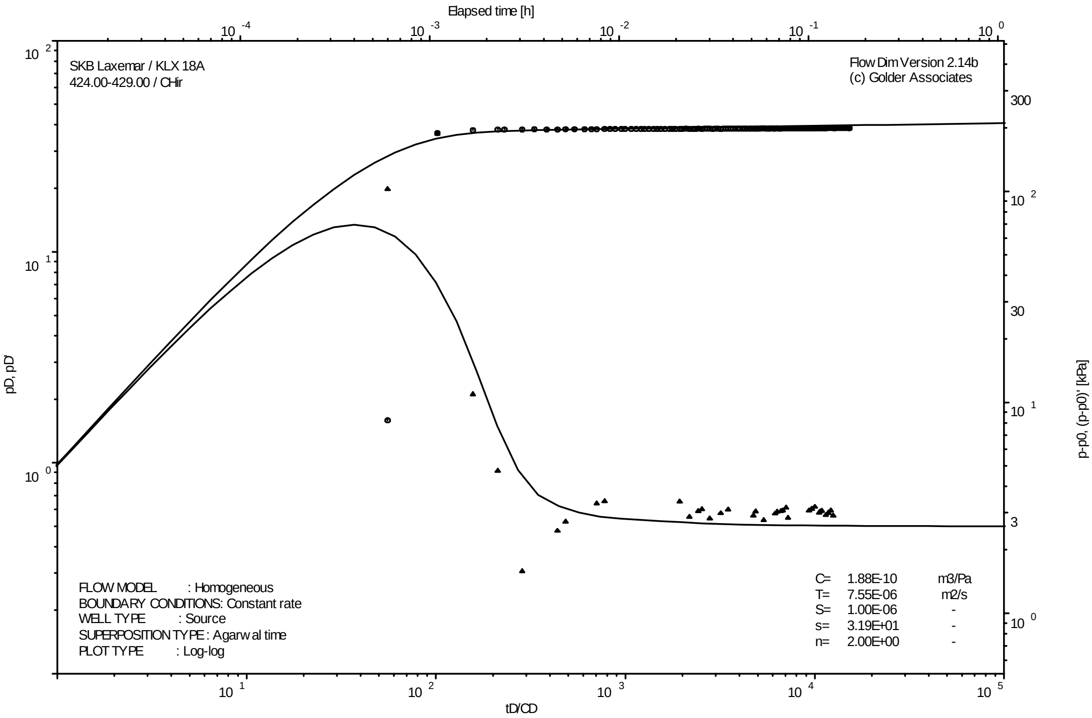
Pressure and flow rate vs. time; cartesian plot



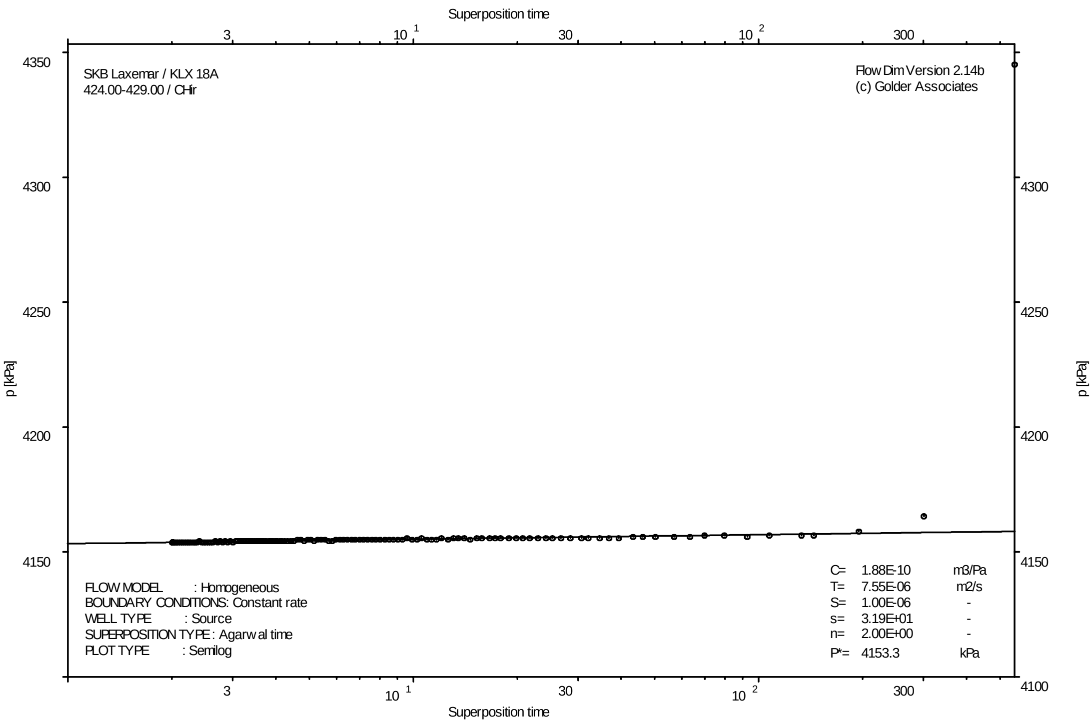
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

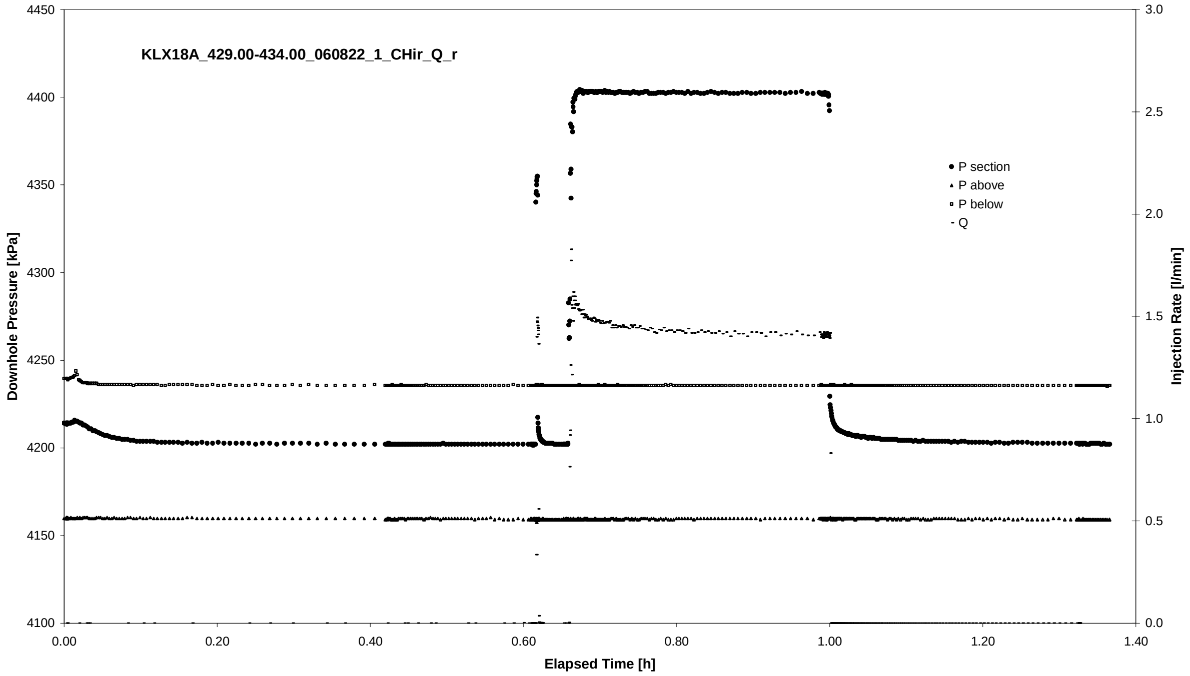


CHIR phase; HORNER match

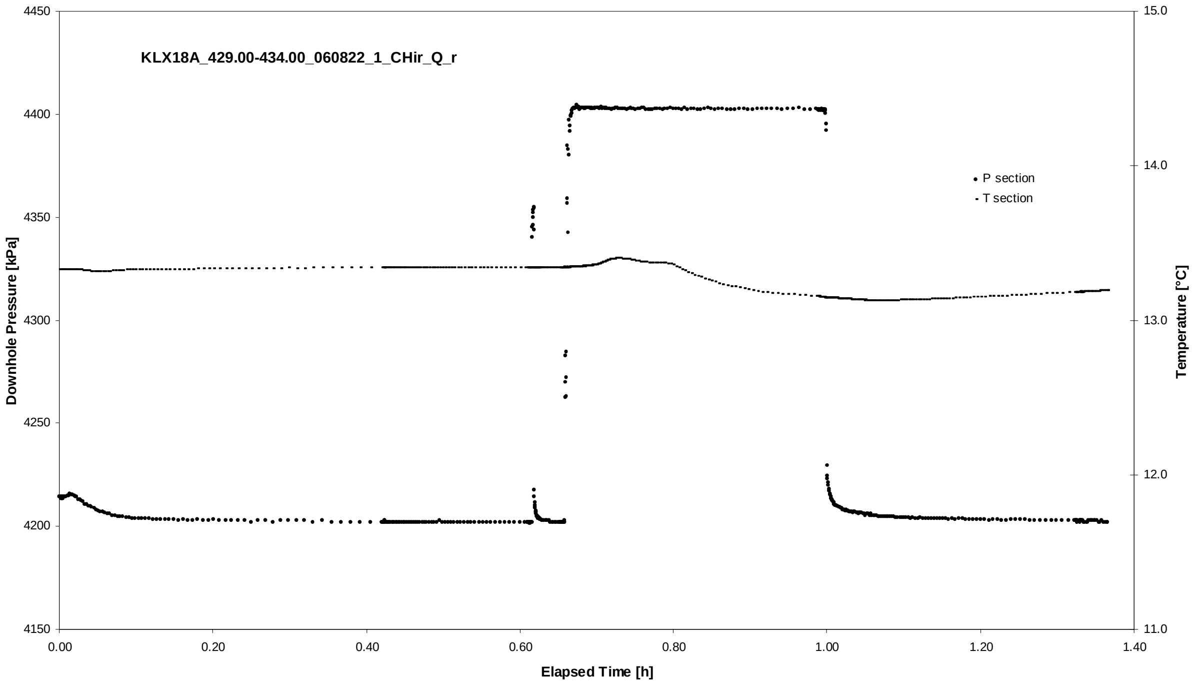
APPENDIX 2-57

Test 429.00 – 434.00 m

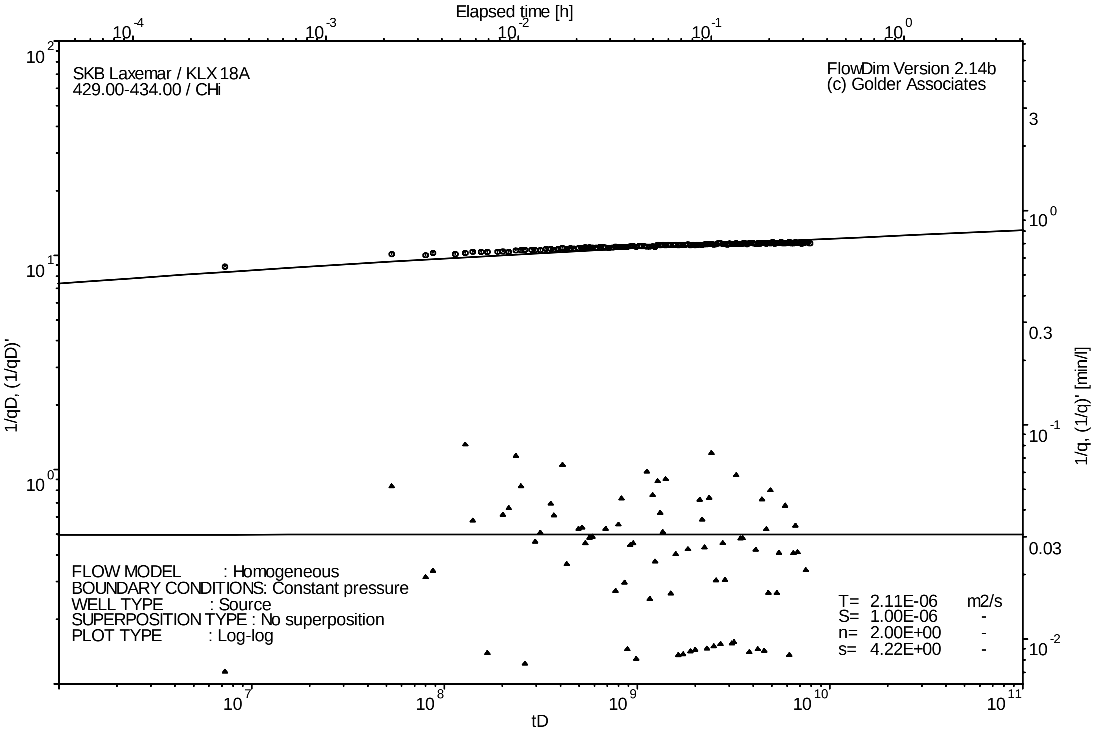
Analysis diagrams



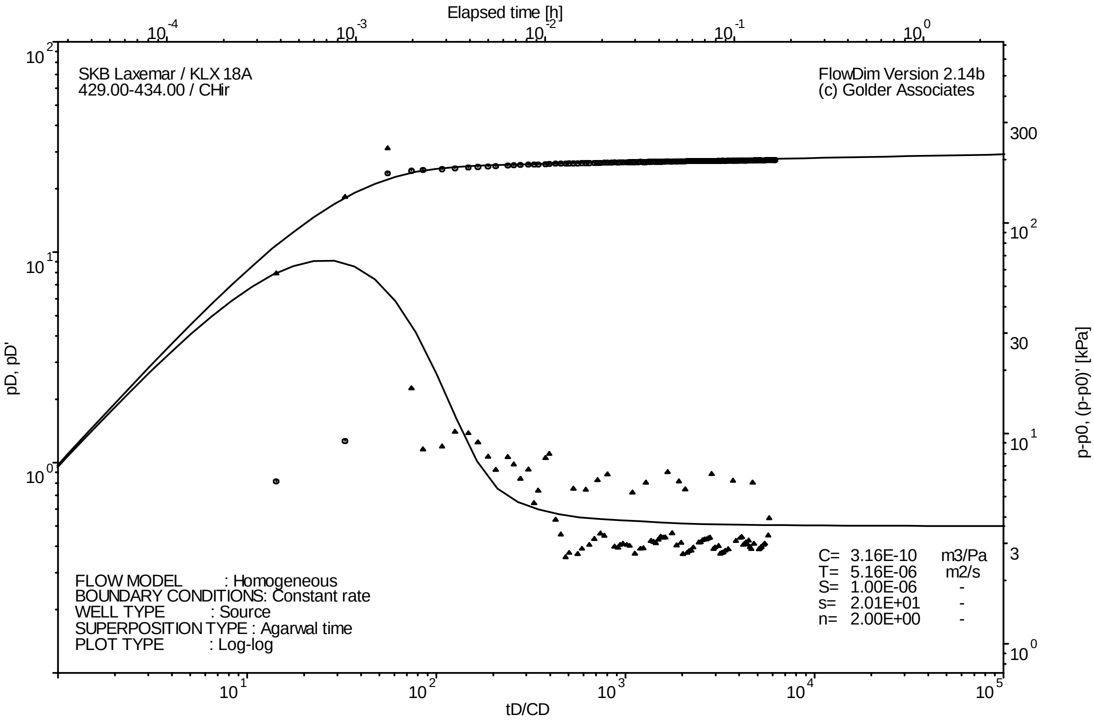
Pressure and flow rate vs. time; cartesian plot



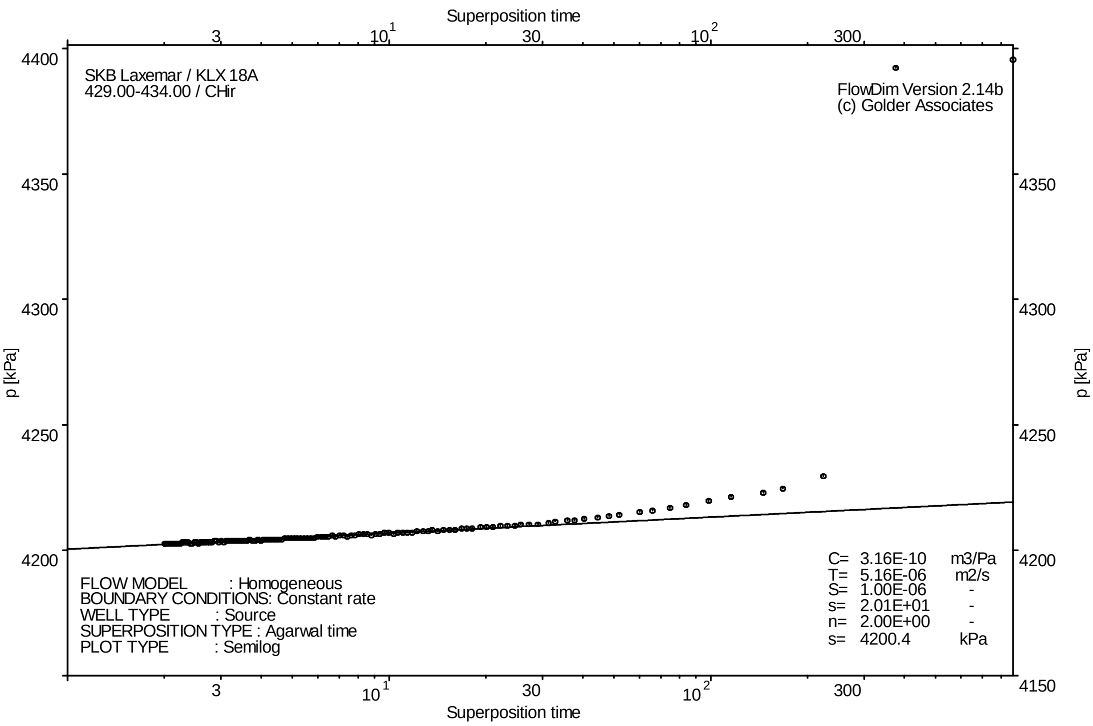
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

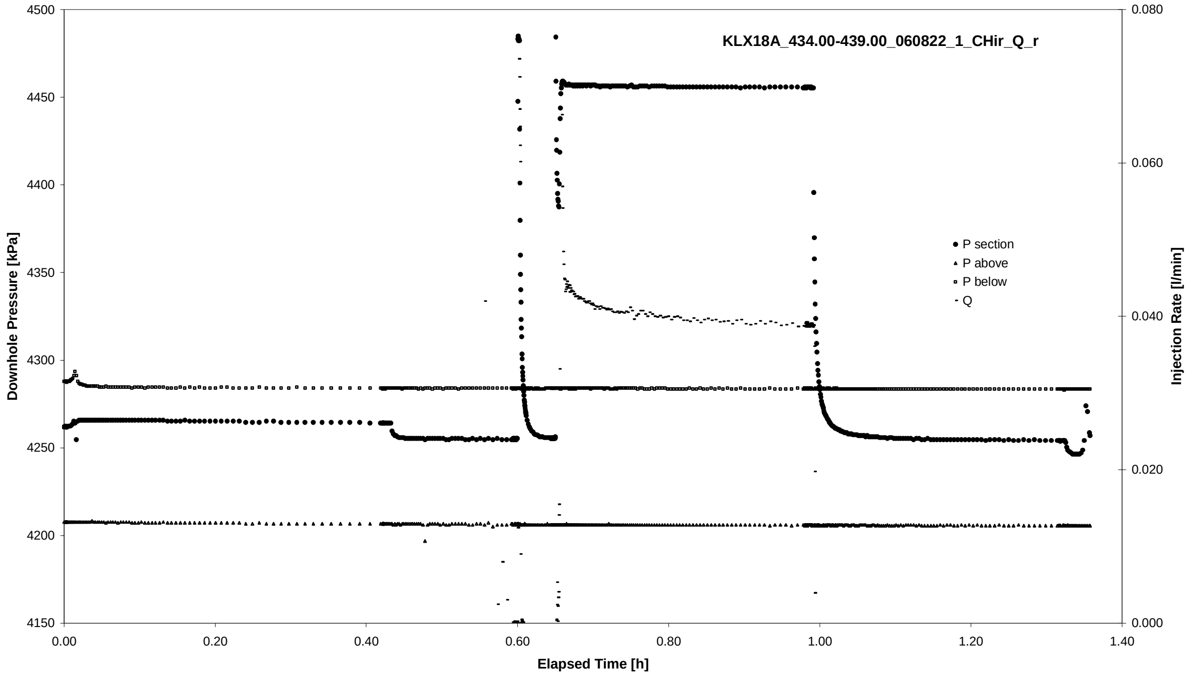


CHIR phase; HORNER match

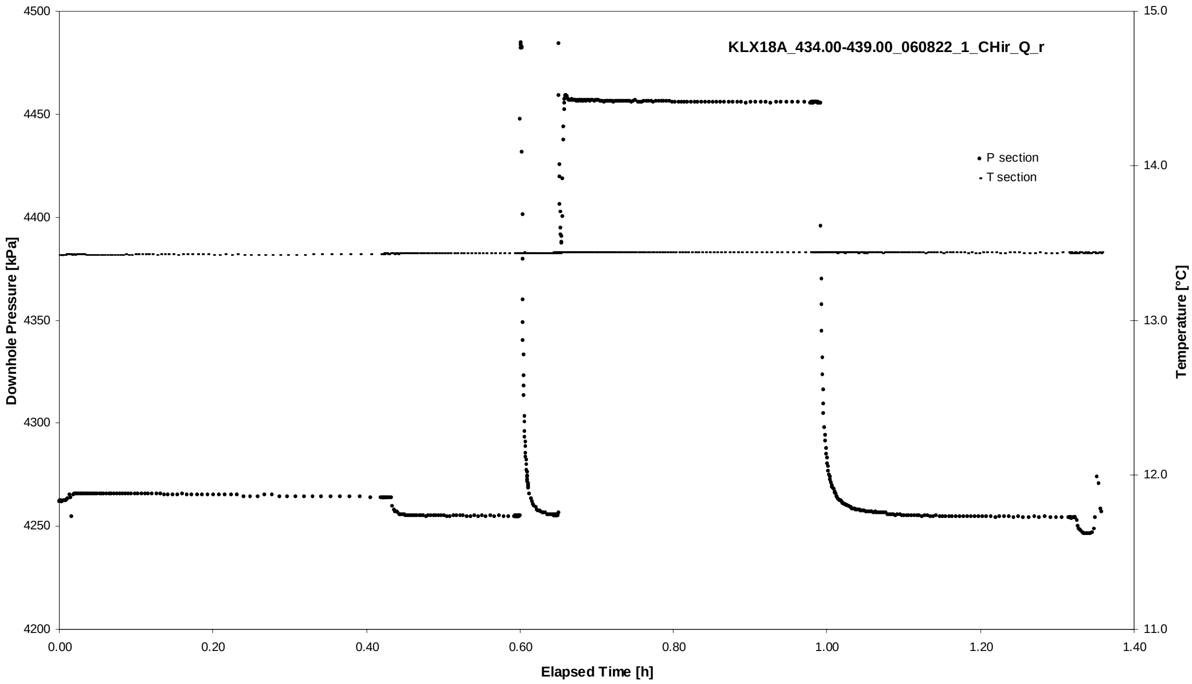
APPENDIX 2-58

Test 434.00 – 439.00 m

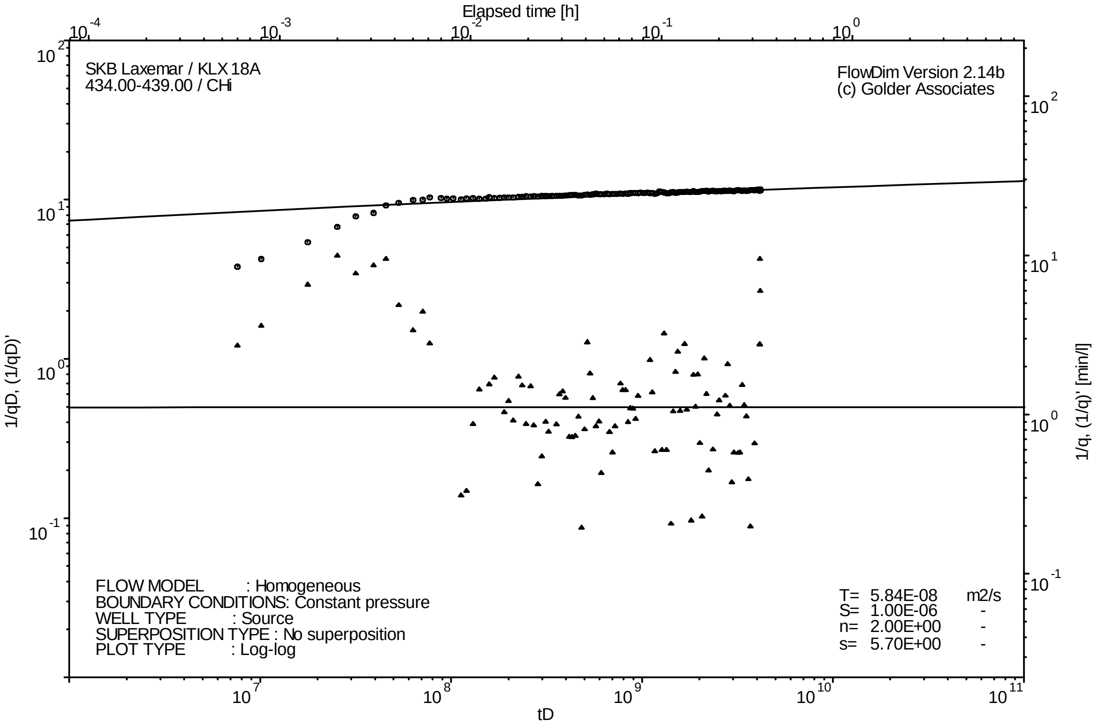
Analysis diagrams



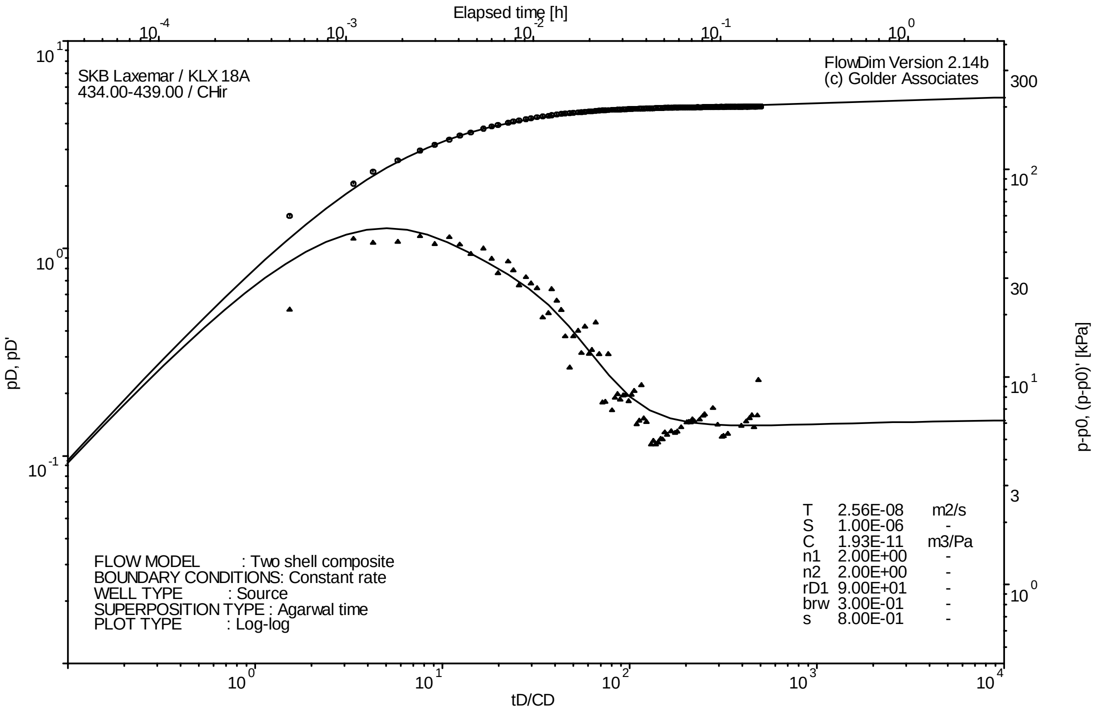
Pressure and flow rate vs. time; cartesian plot



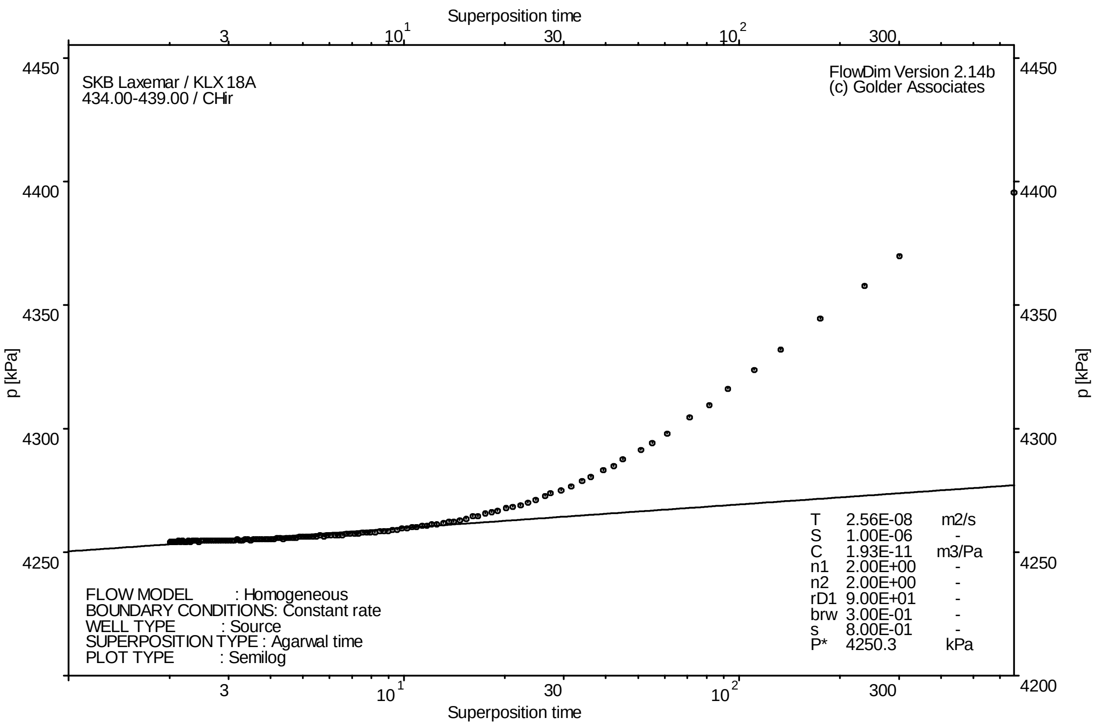
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

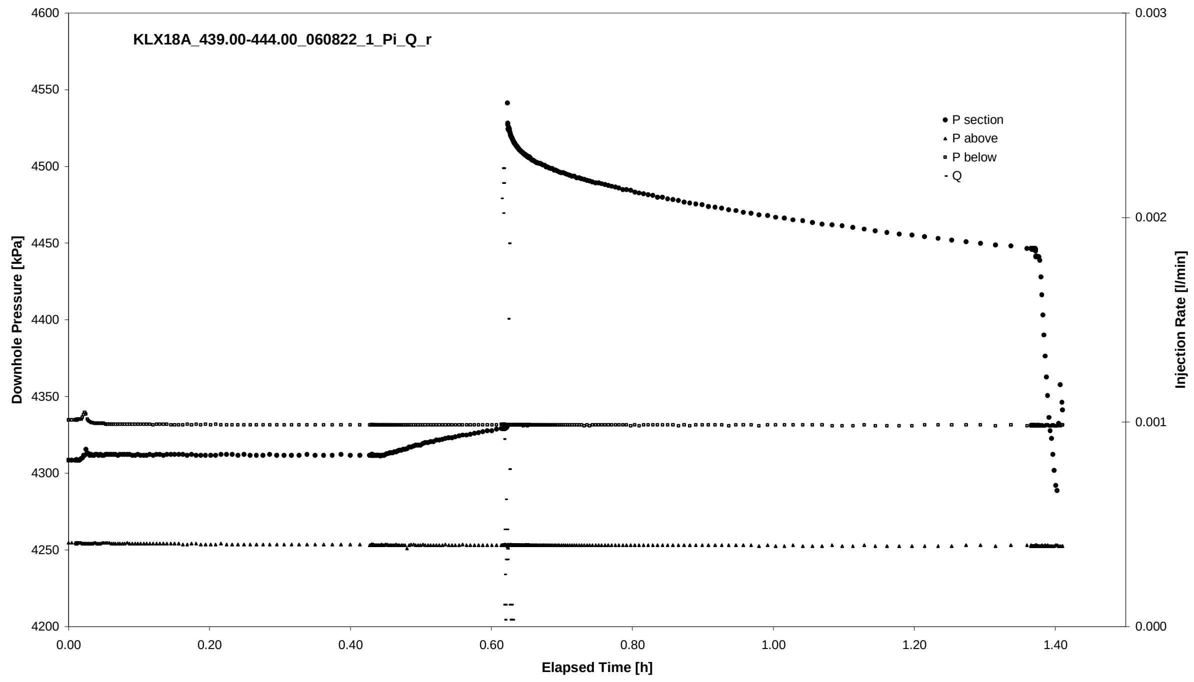


CHIR phase; HORNER match

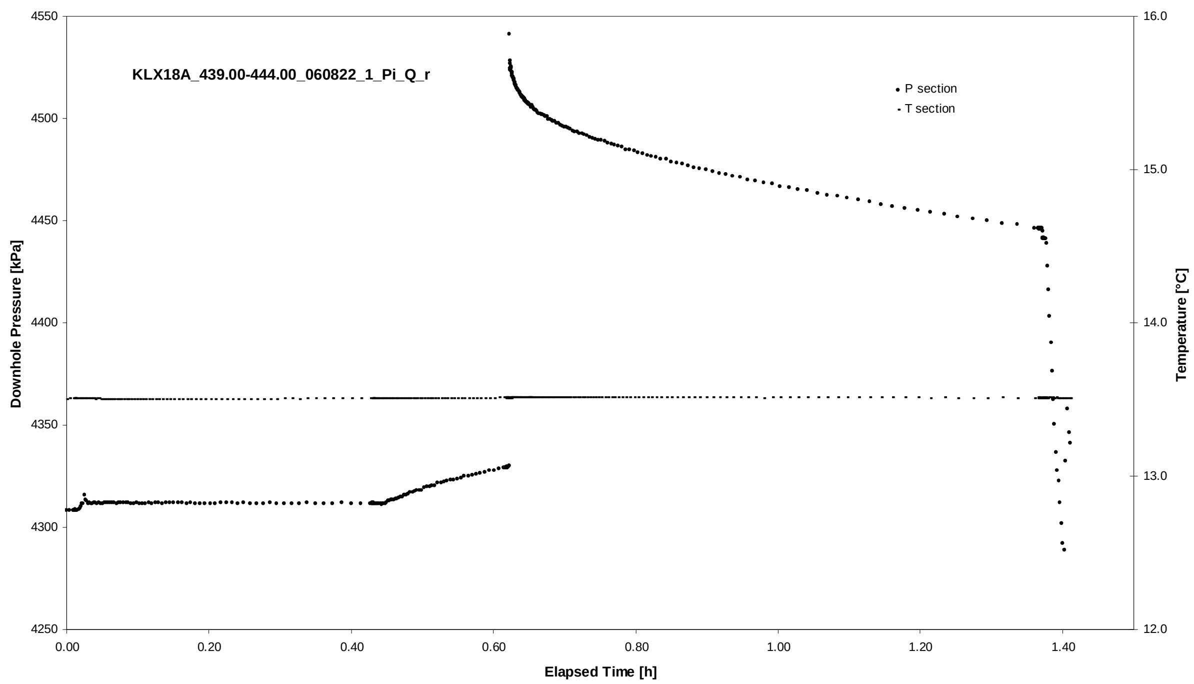
APPENDIX 2-59

Test 439.00 – 444.00 m

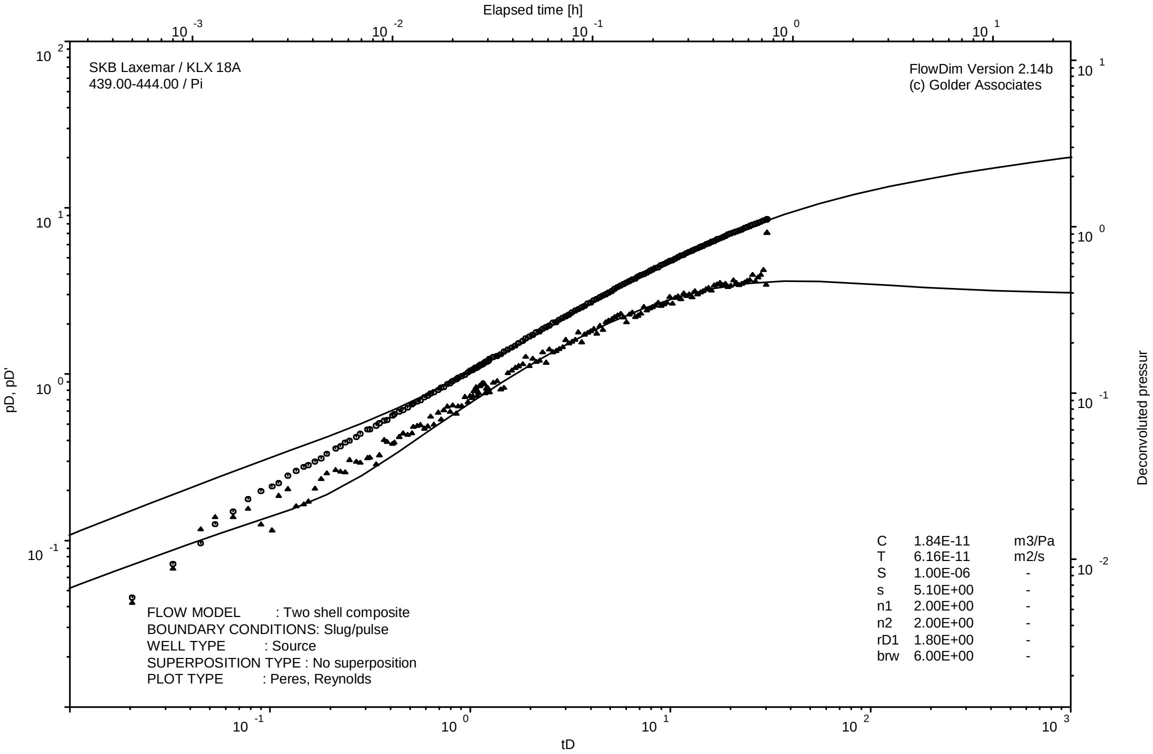
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

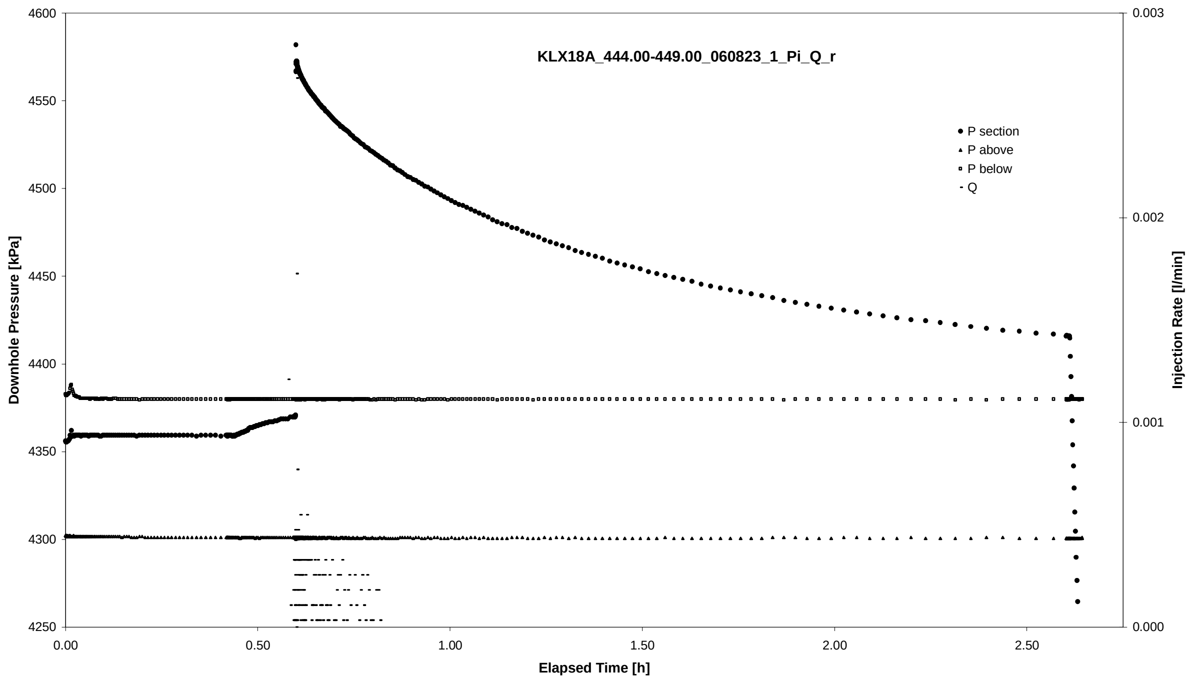


Pulse injection; deconvolution match

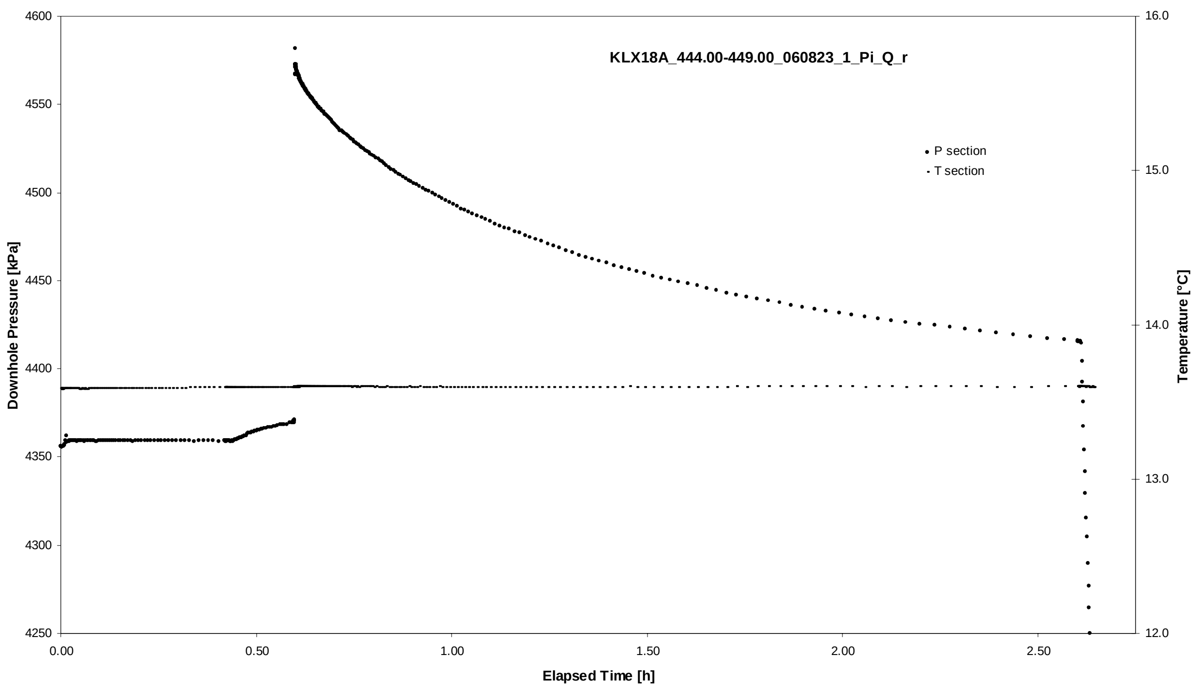
APPENDIX 2-60

Test 444.00 – 449.00 m

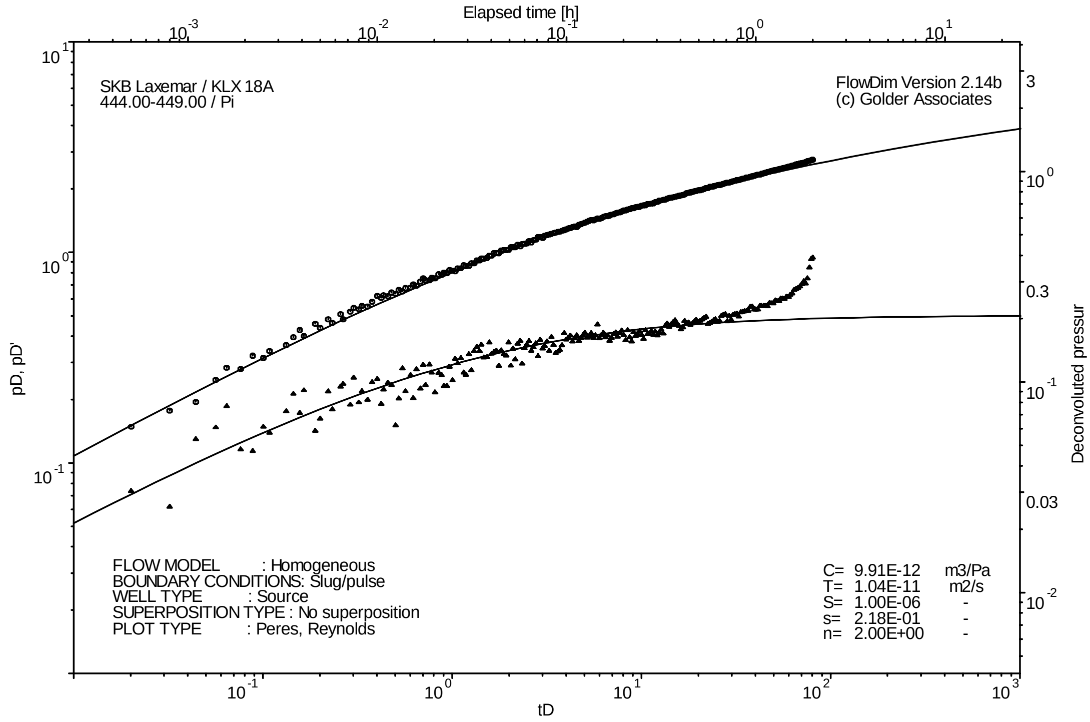
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

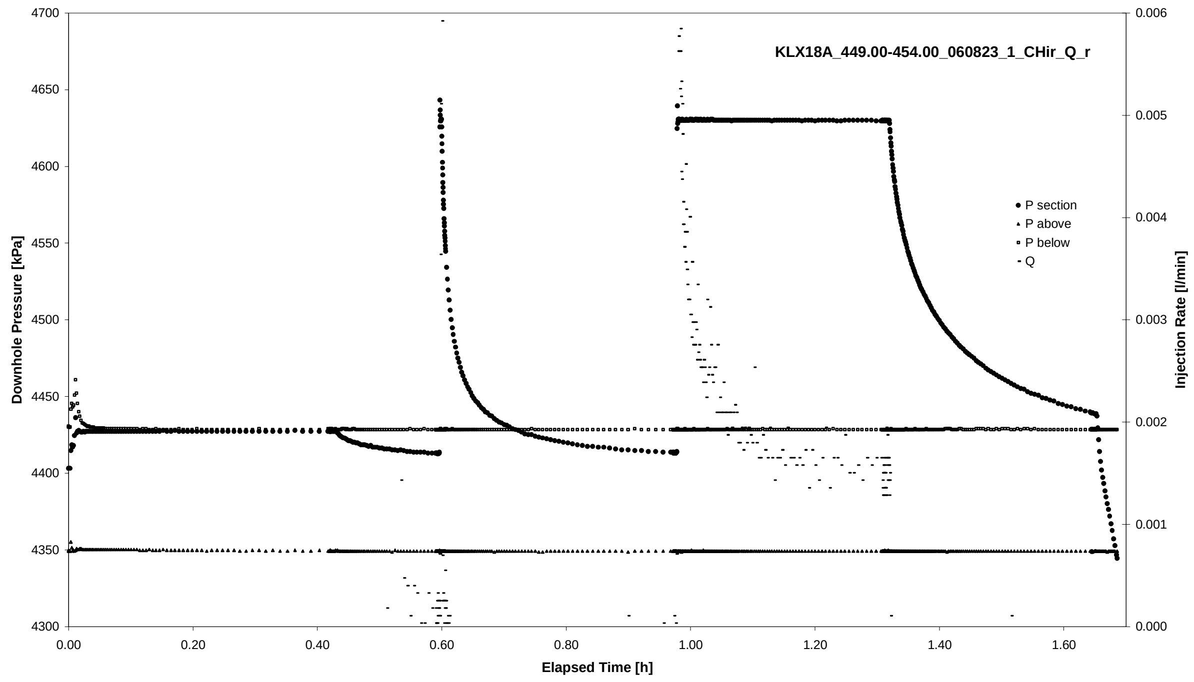


Pulse injection; deconvolution match

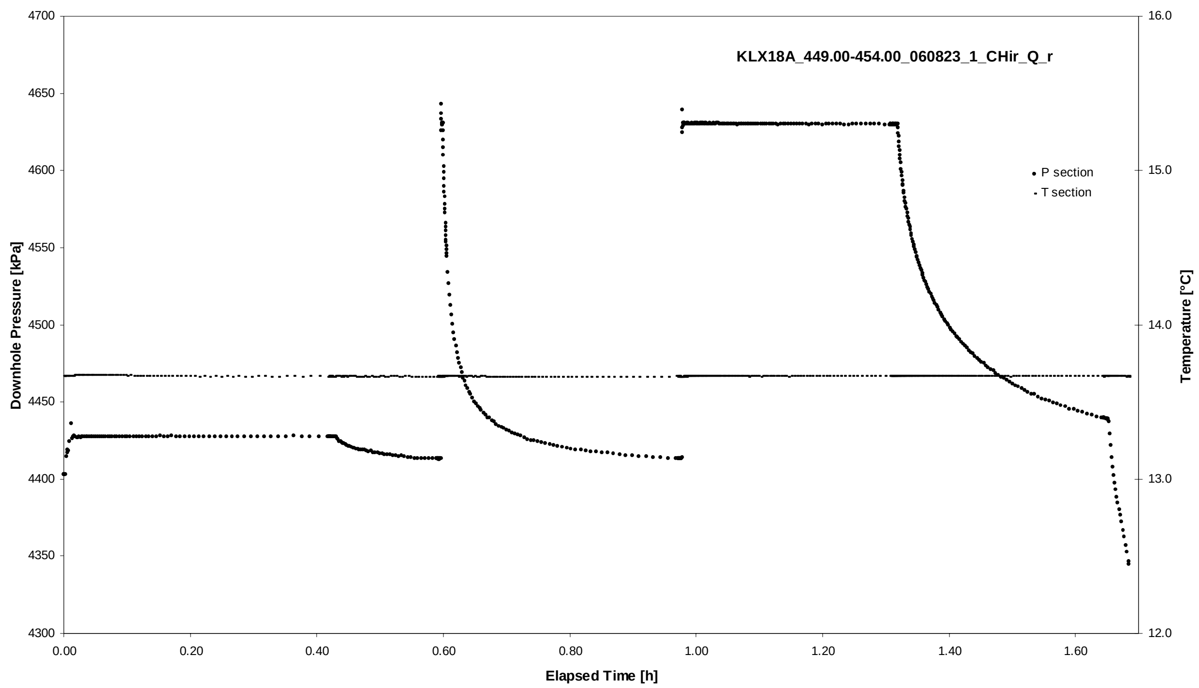
APPENDIX 2-61

Test 449.00 – 454.00 m

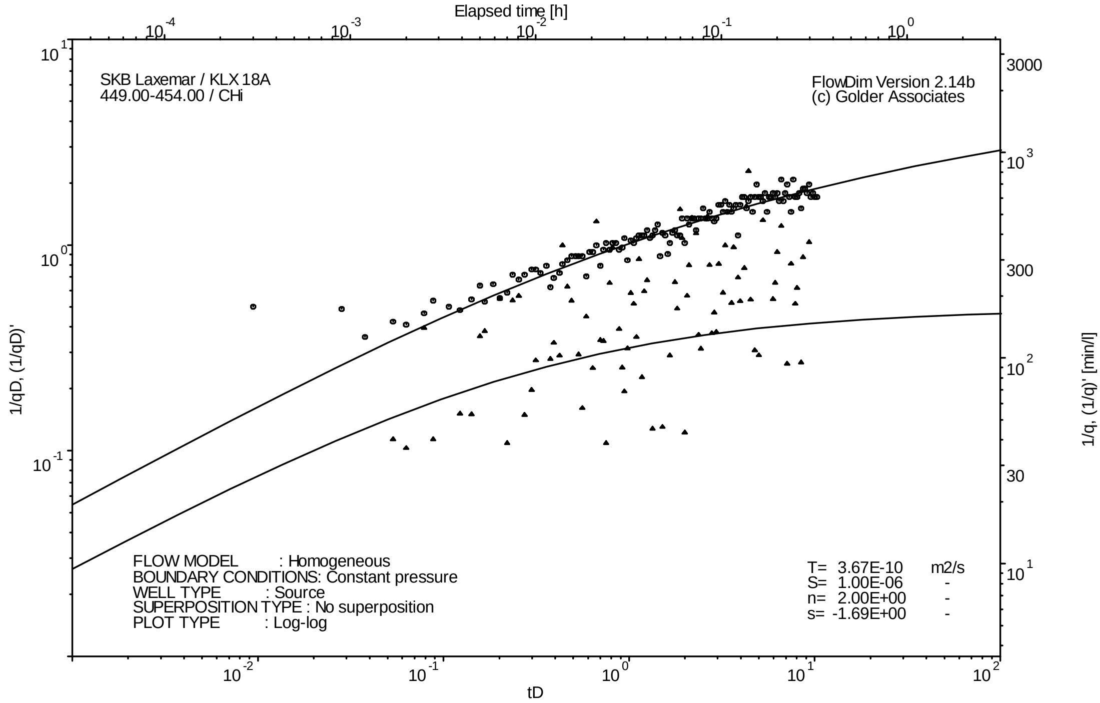
Analysis diagrams



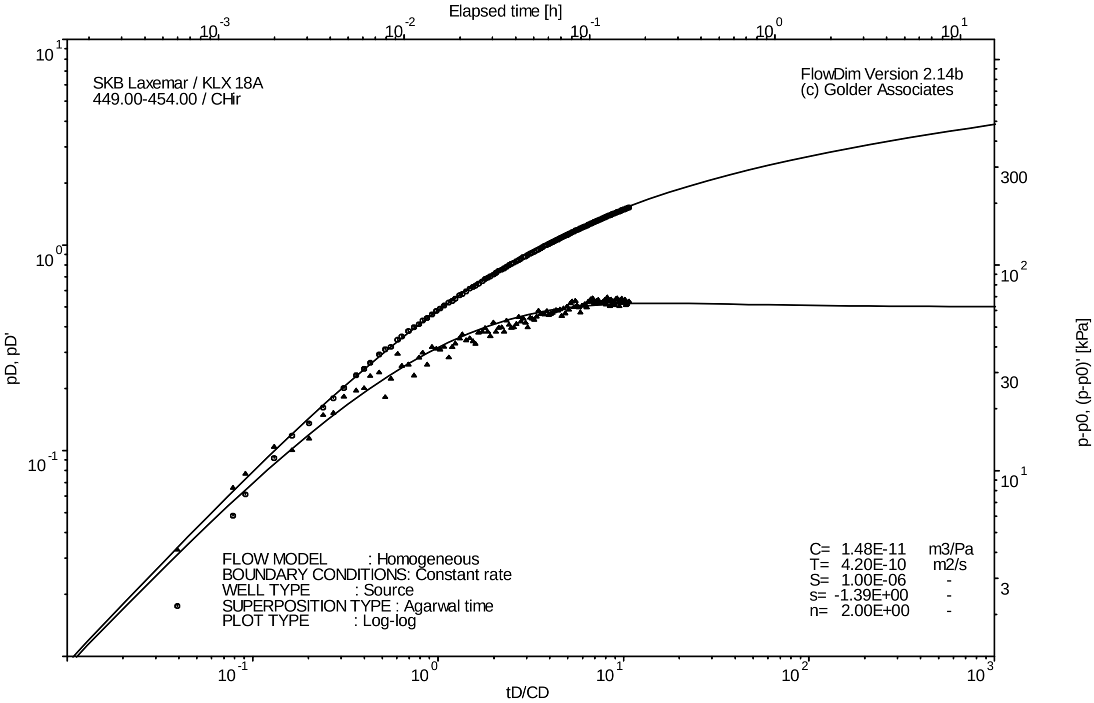
Pressure and flow rate vs. time; cartesian plot



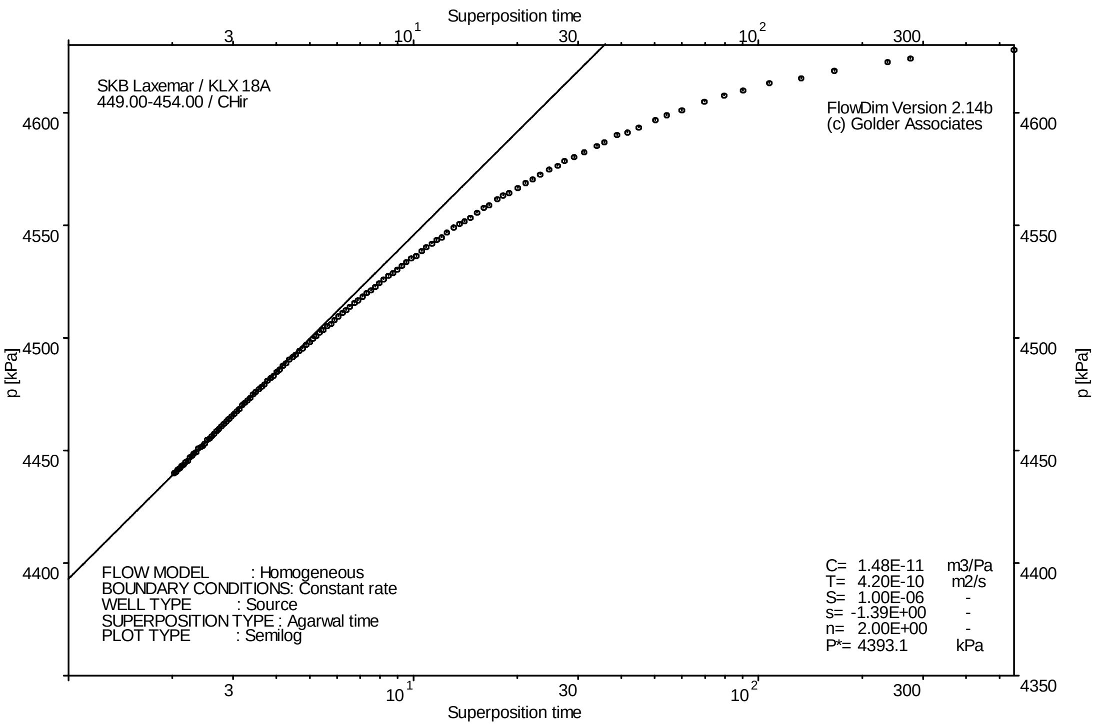
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

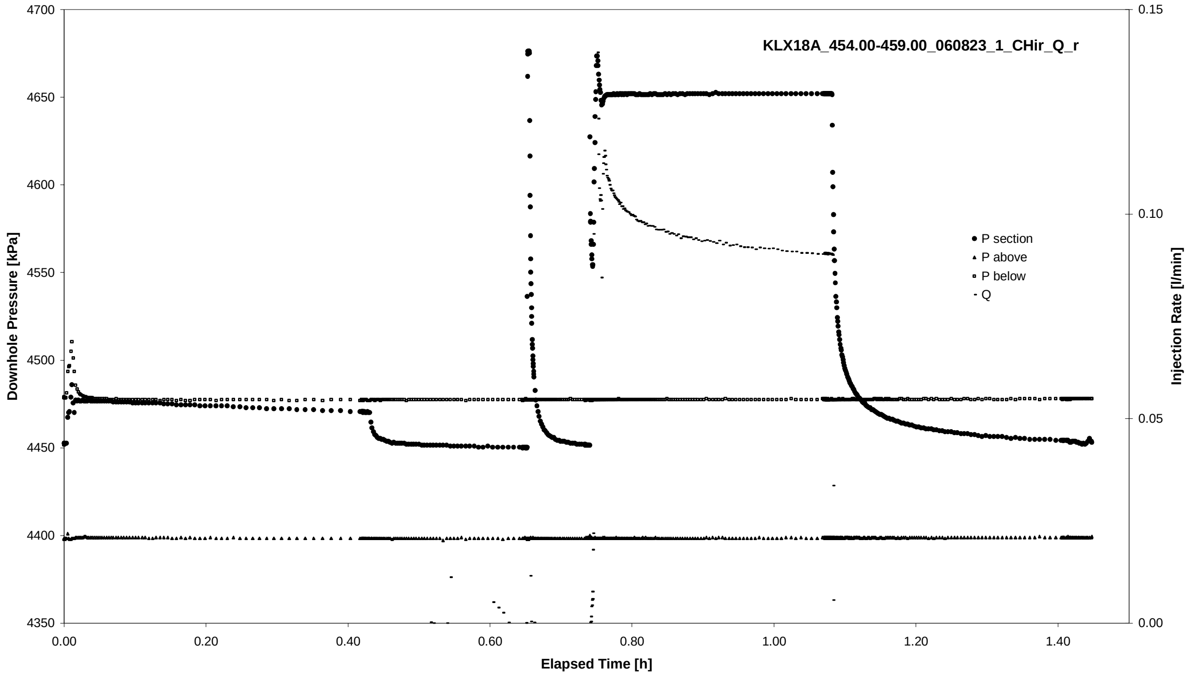


CHIR phase; HORNER match

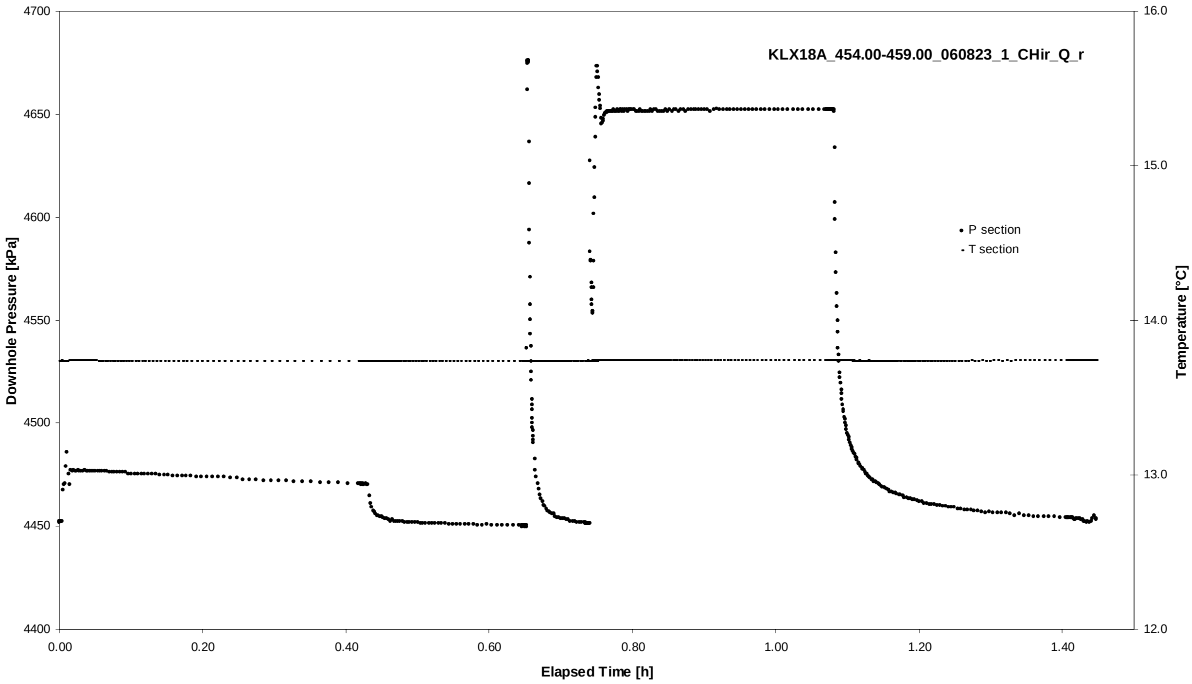
APPENDIX 2-62

Test 454.00 – 459.00 m

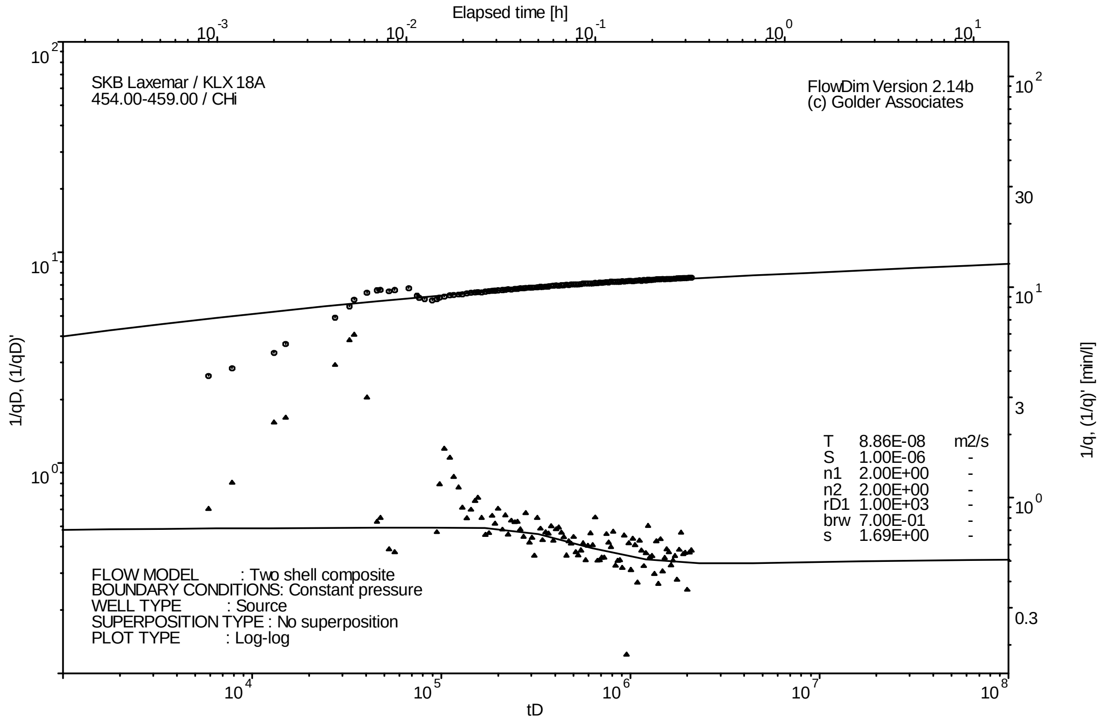
Analysis diagrams



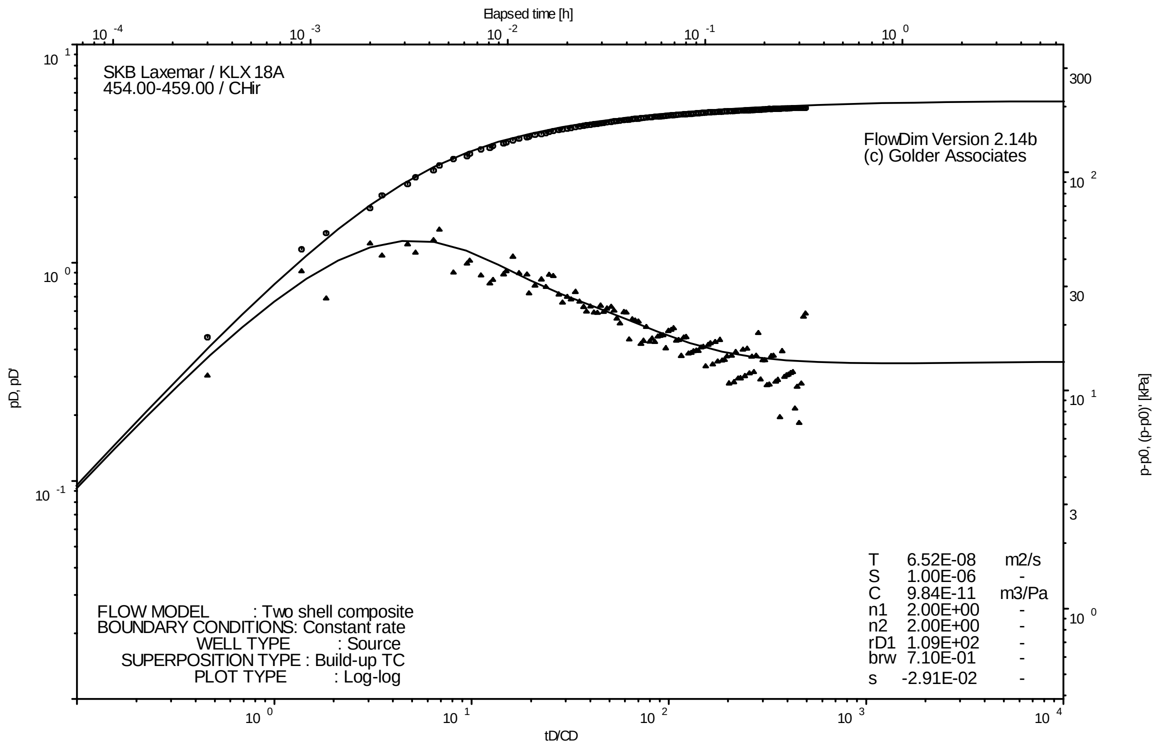
Pressure and flow rate vs. time; cartesian plot



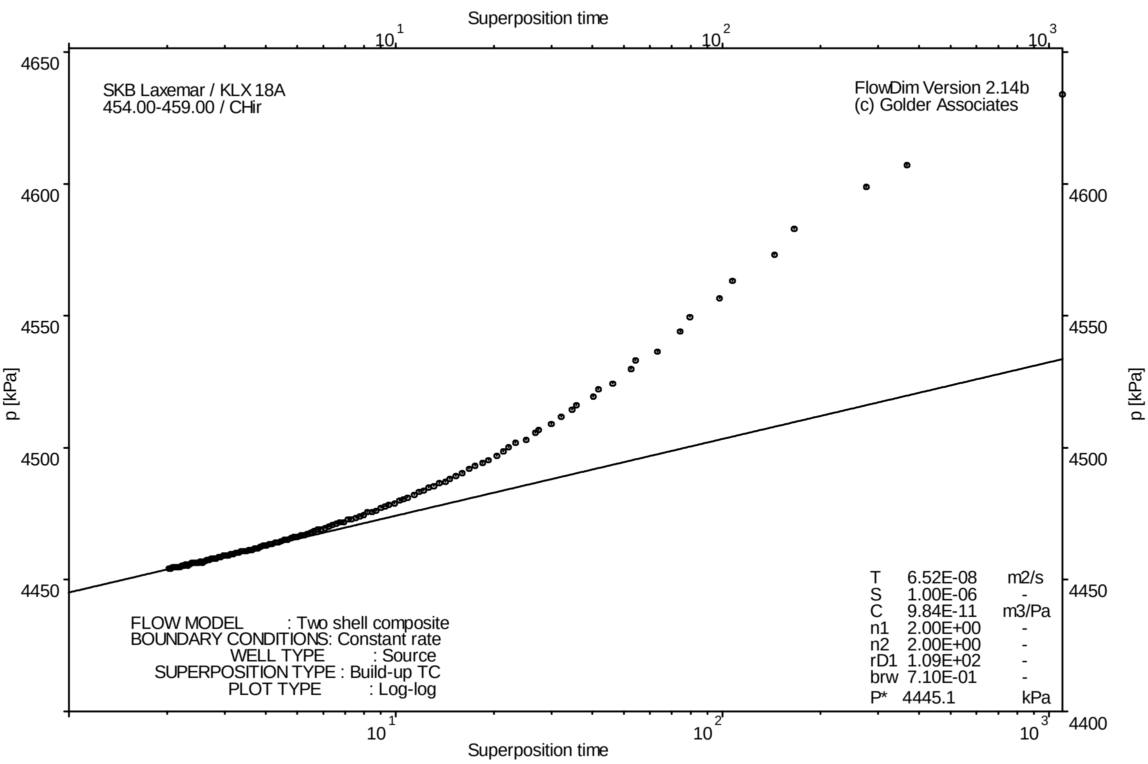
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

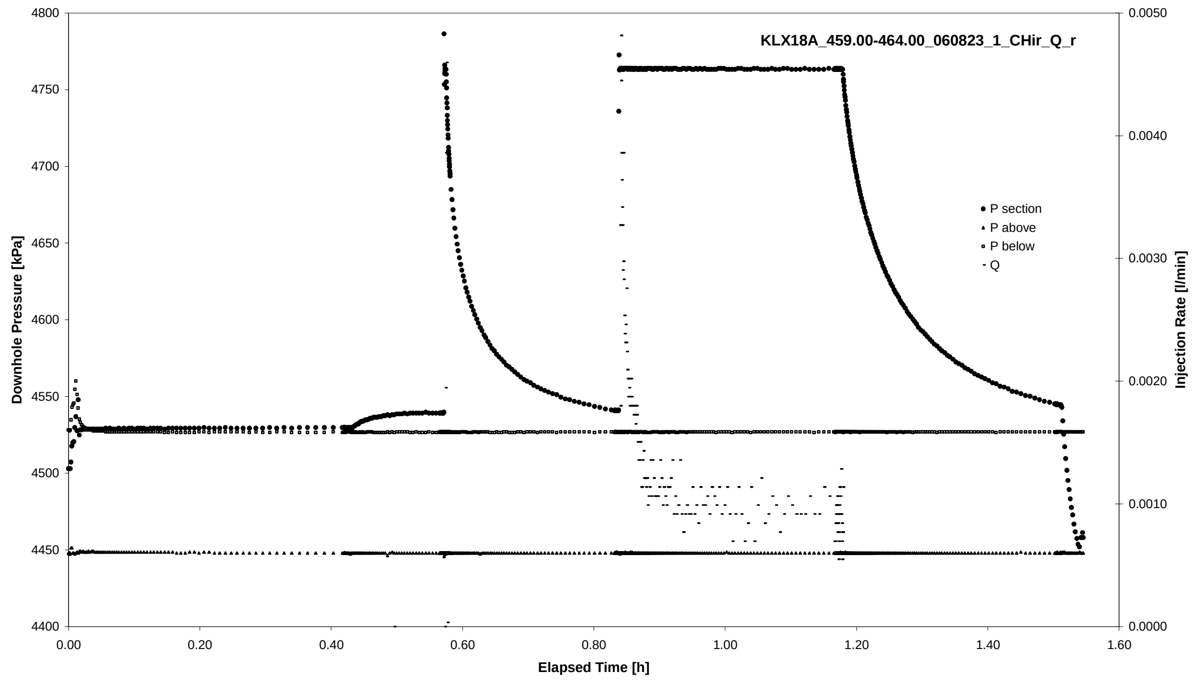


CHIR phase; HORNER match

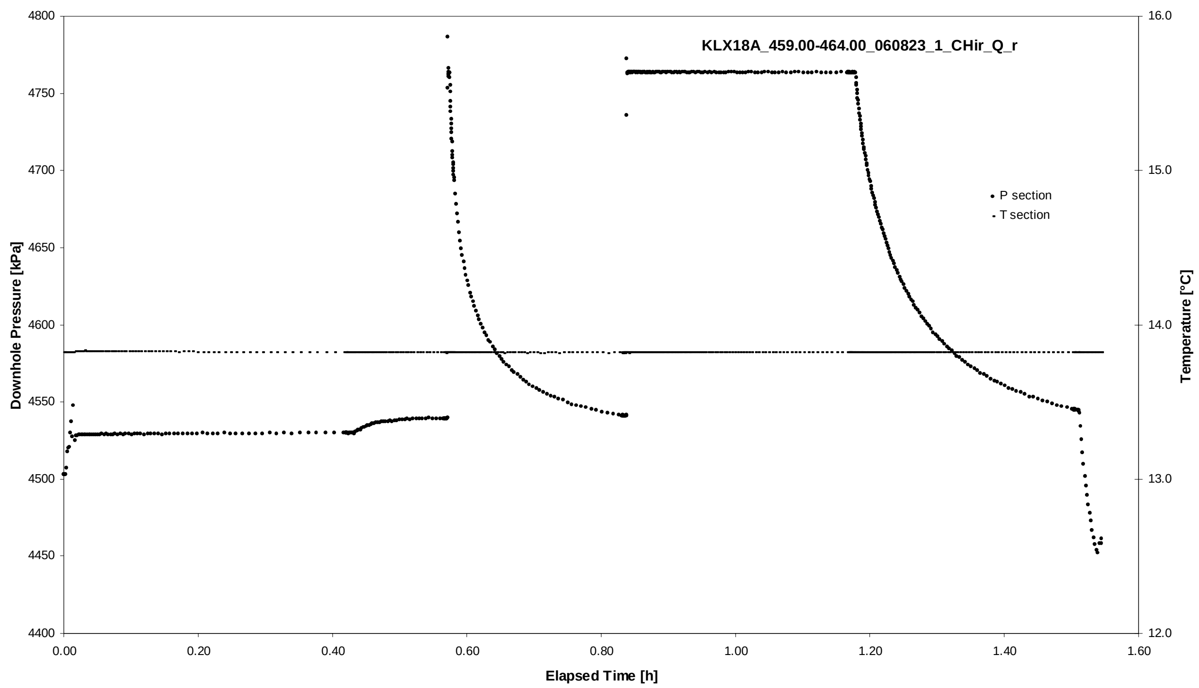
APPENDIX 2-63

Test 459.00 – 464.00 m

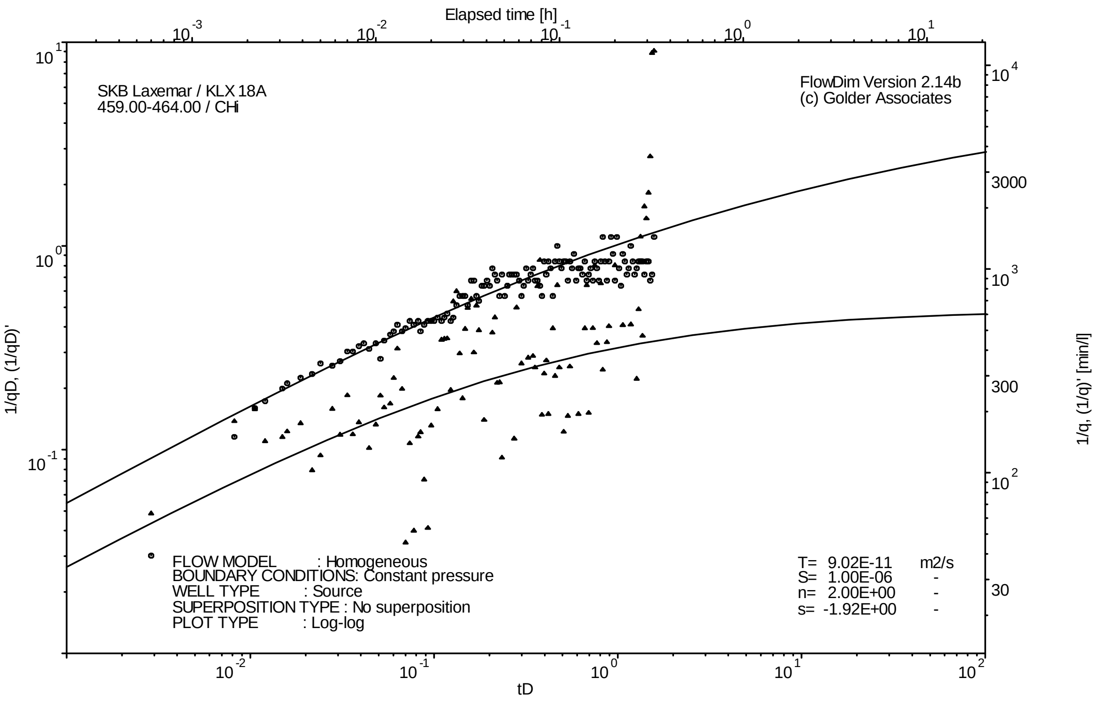
Analysis diagrams



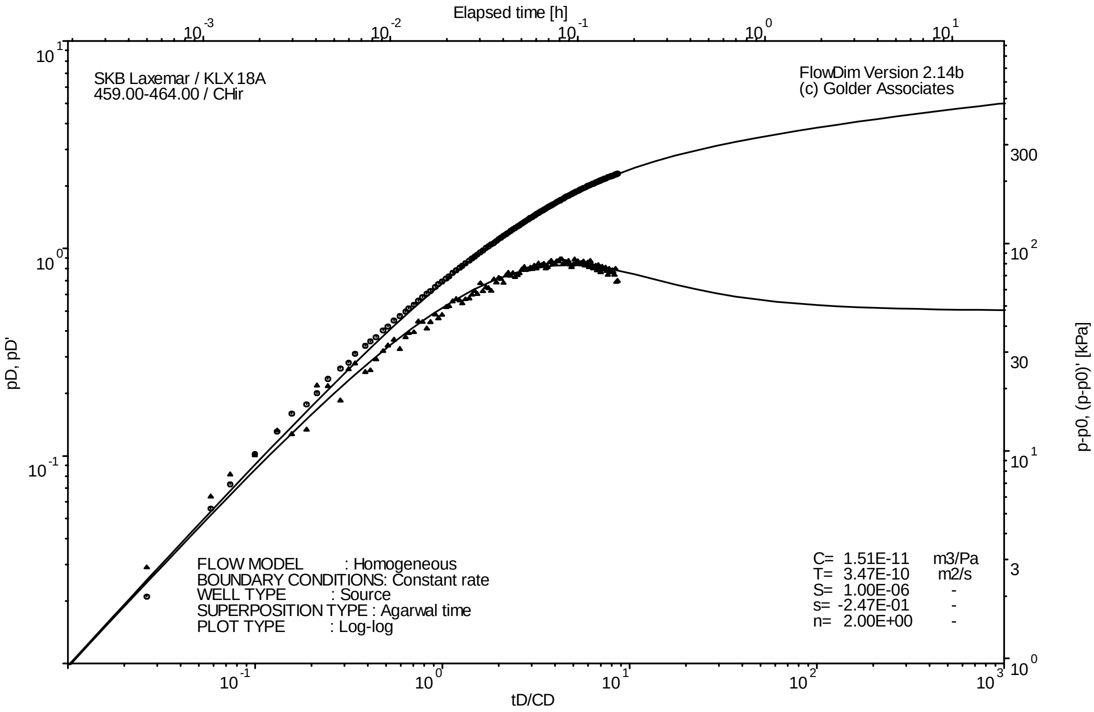
Pressure and flow rate vs. time; cartesian plot



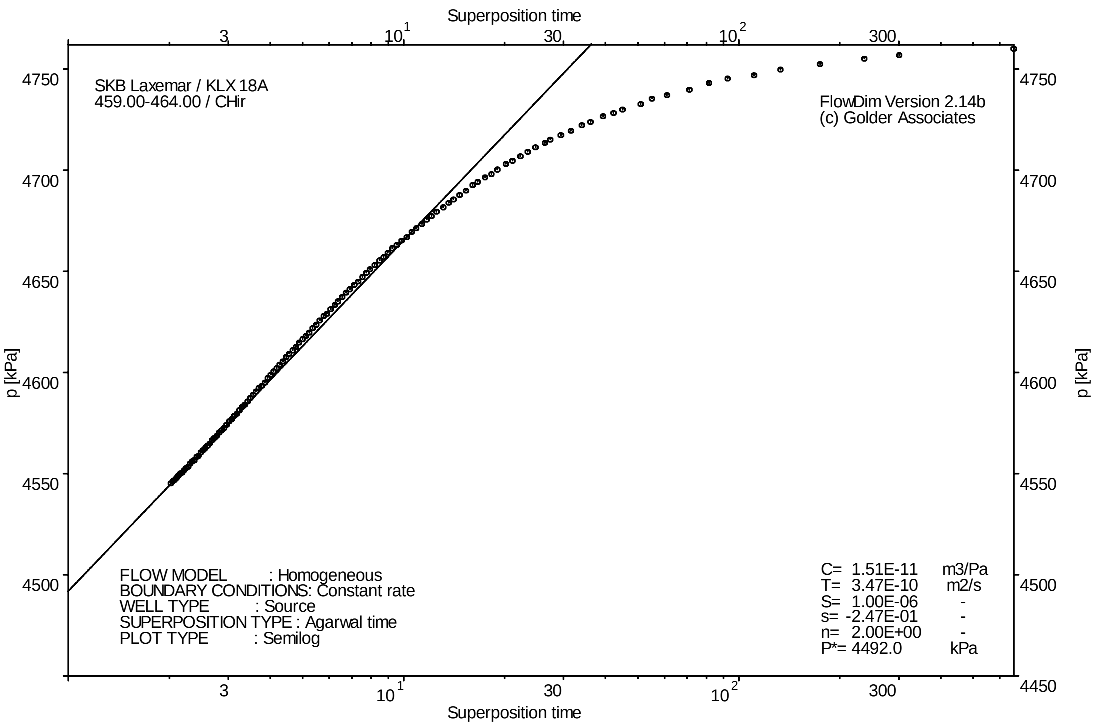
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

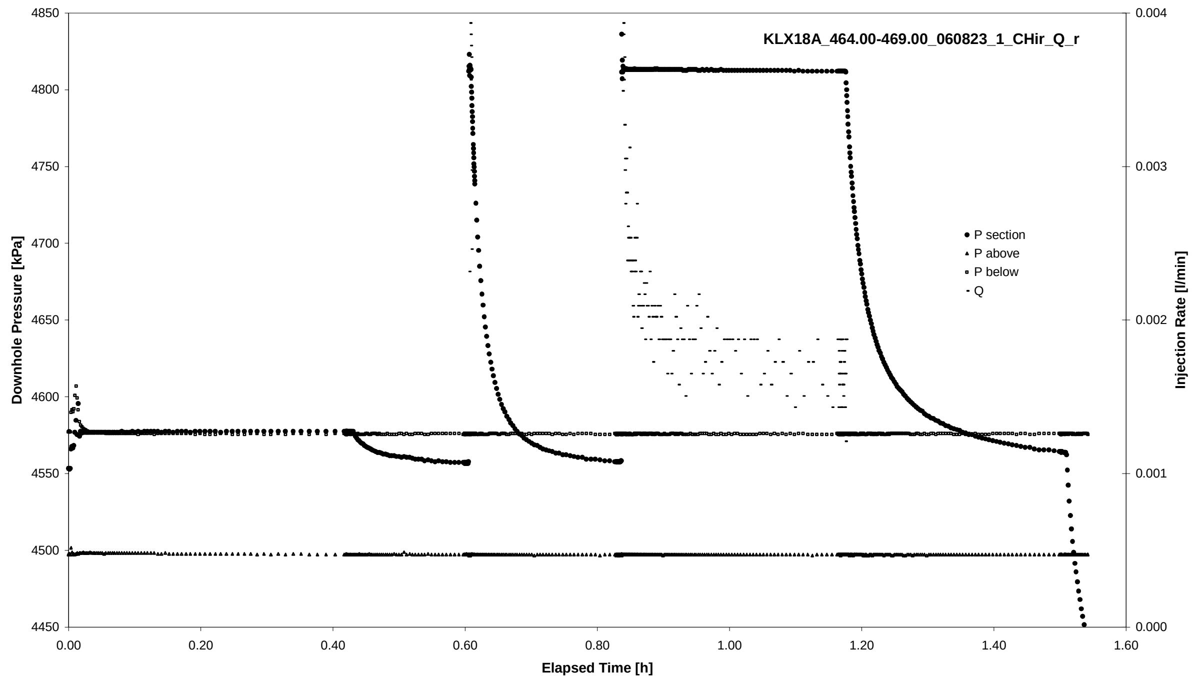


CHIR phase; HORNER match

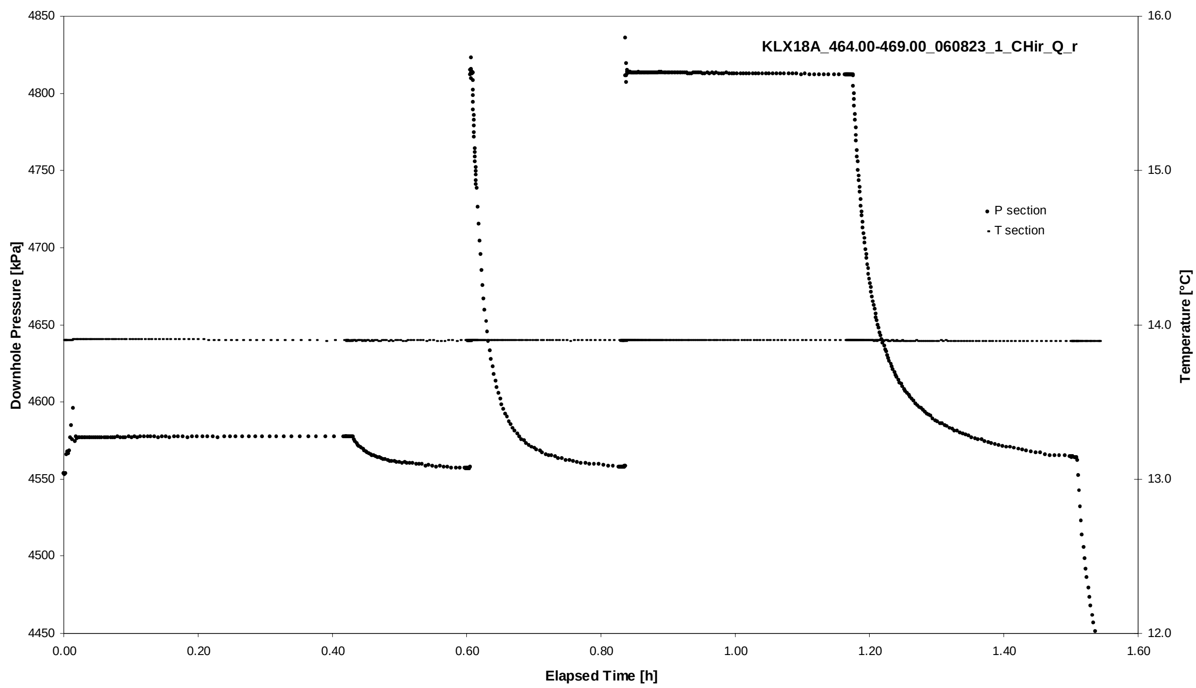
APPENDIX 2-64

Test 464.00 – 469.00 m

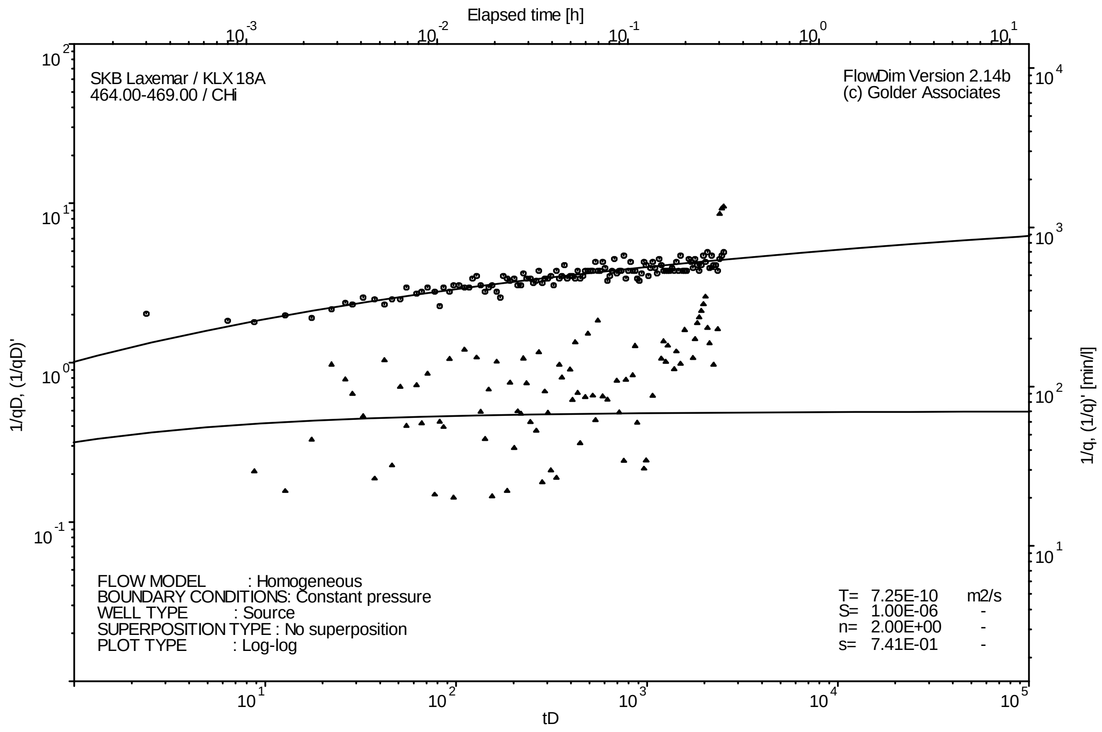
Analysis diagrams



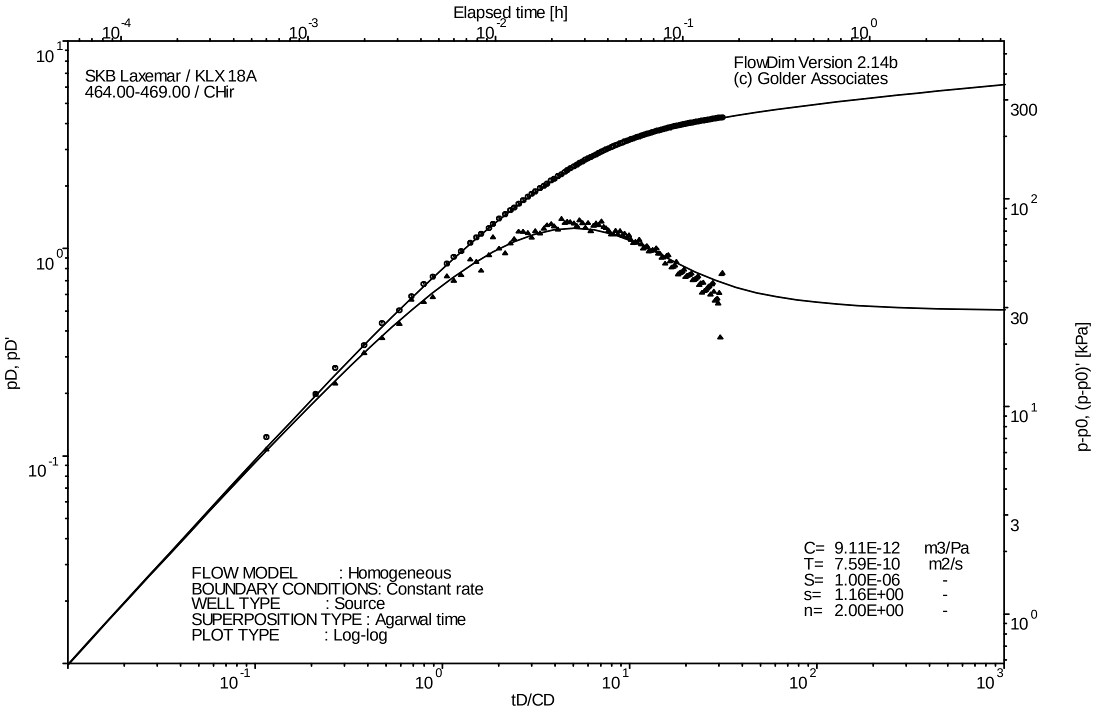
Pressure and flow rate vs. time; cartesian plot



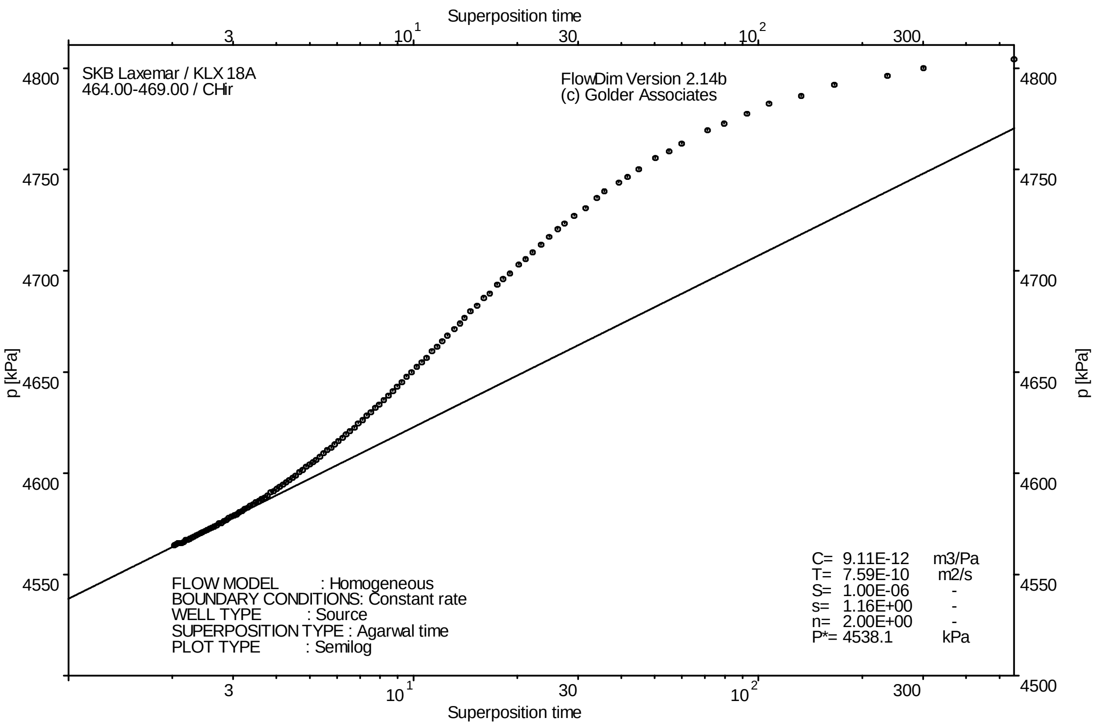
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

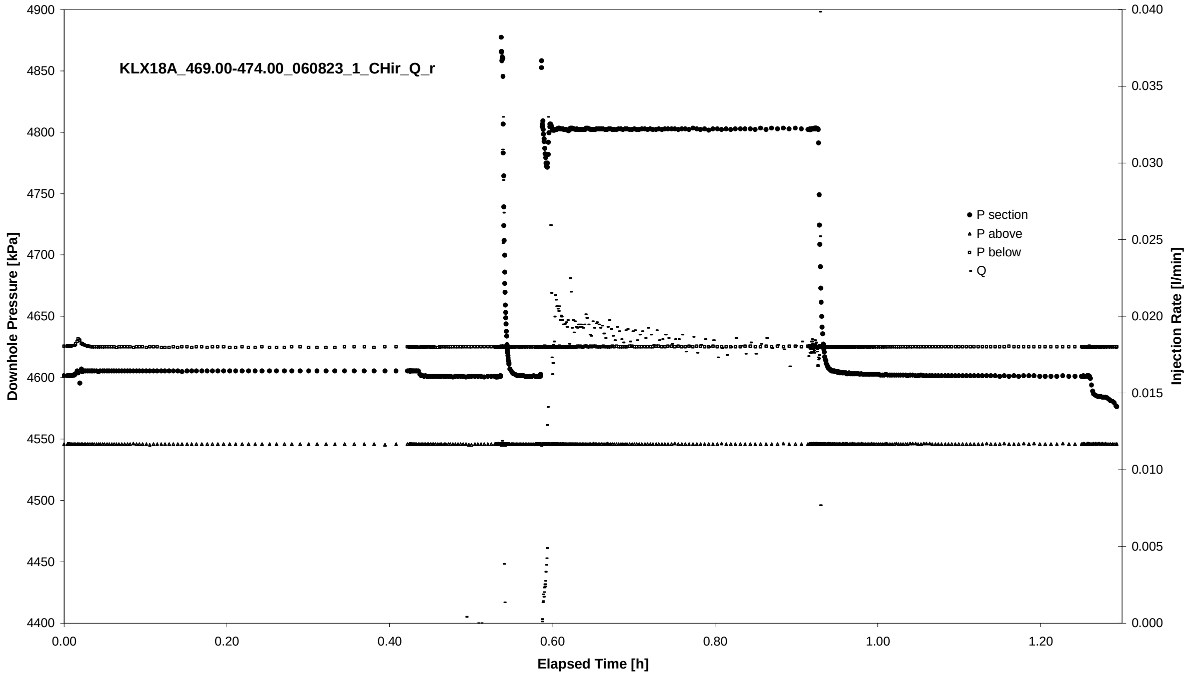


CHIR phase; HORNER match

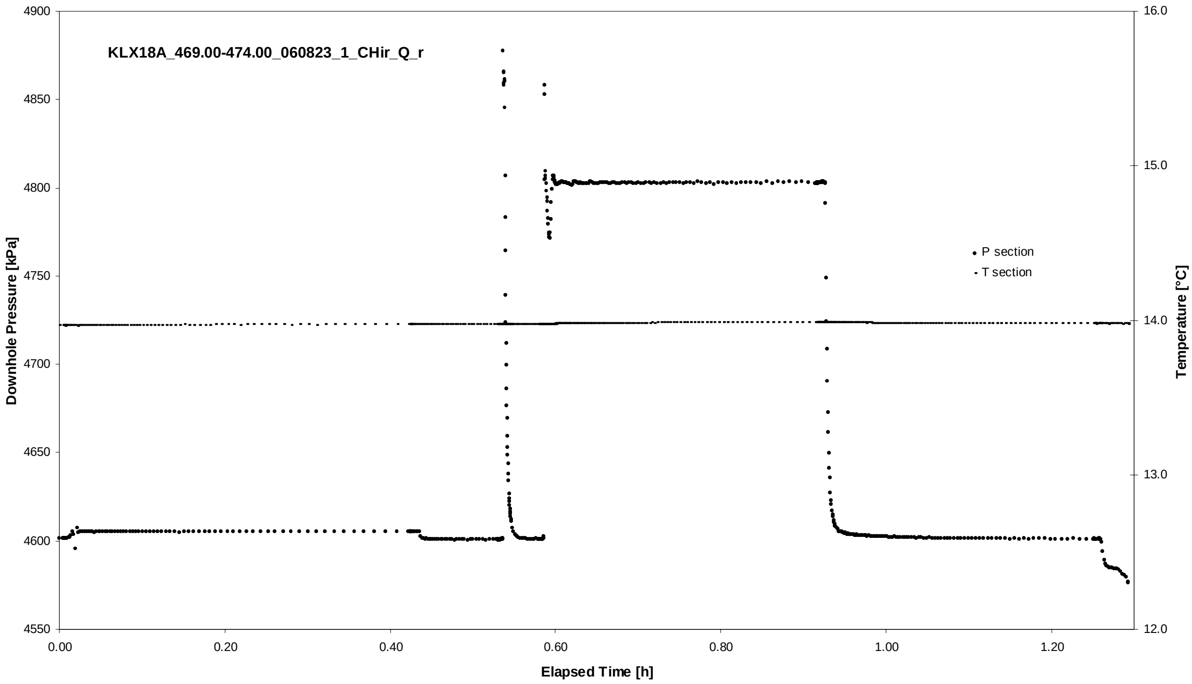
APPENDIX 2-65

Test 469.00 – 474.00 m

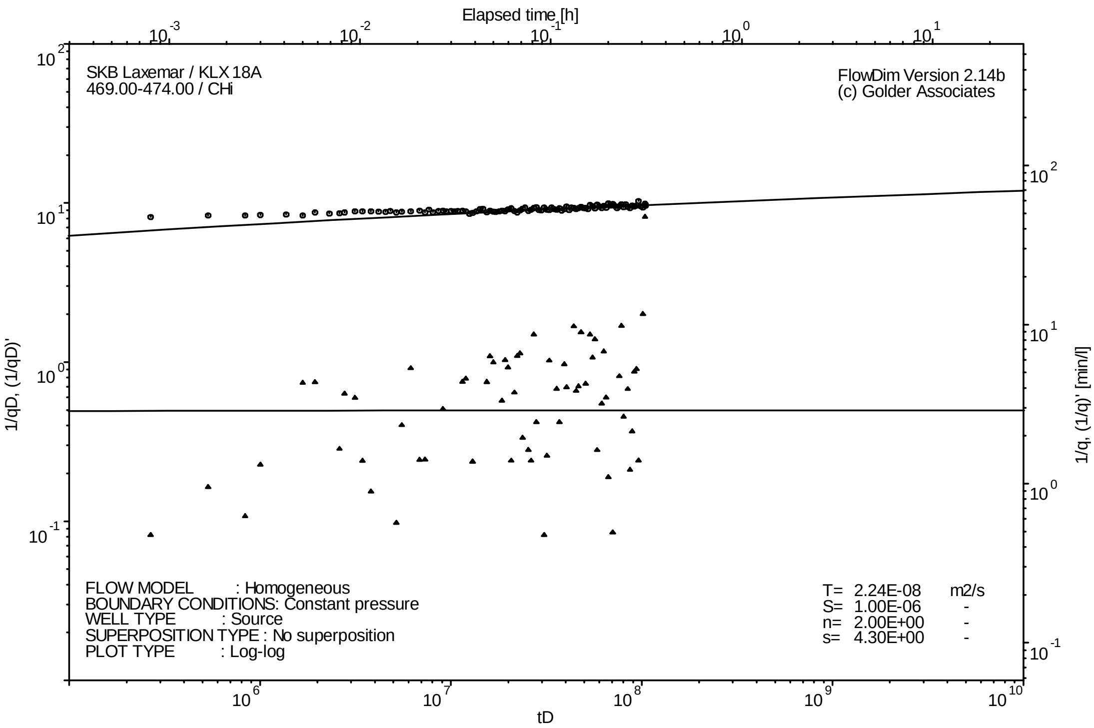
Analysis diagrams



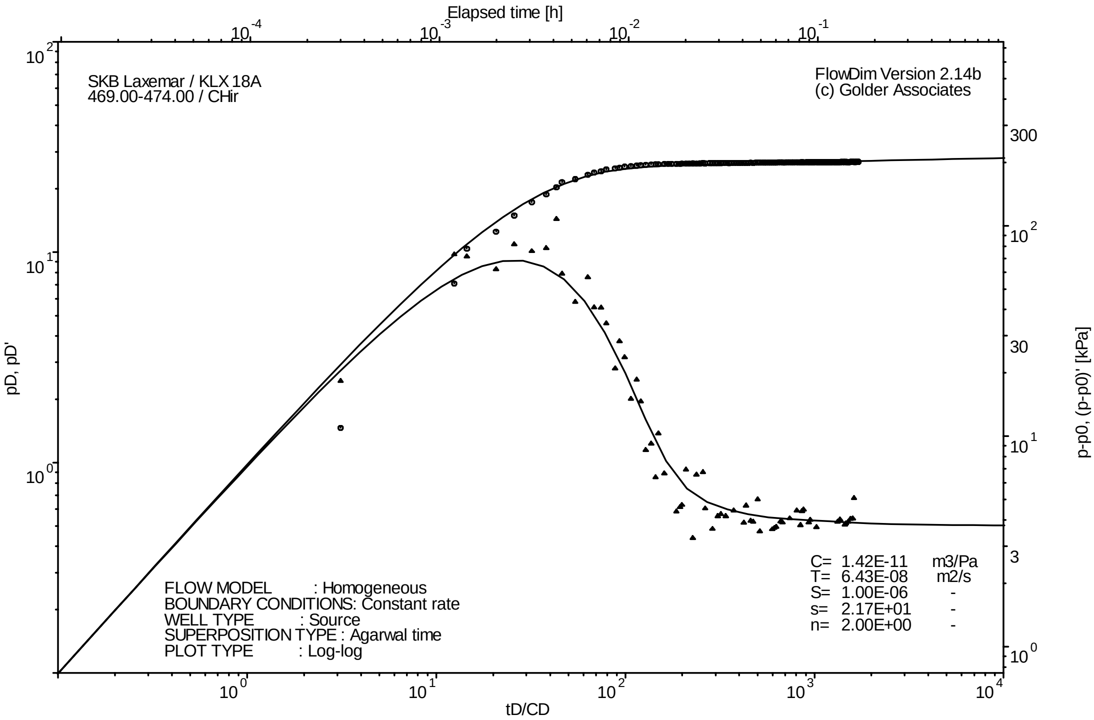
Pressure and flow rate vs. time; cartesian plot



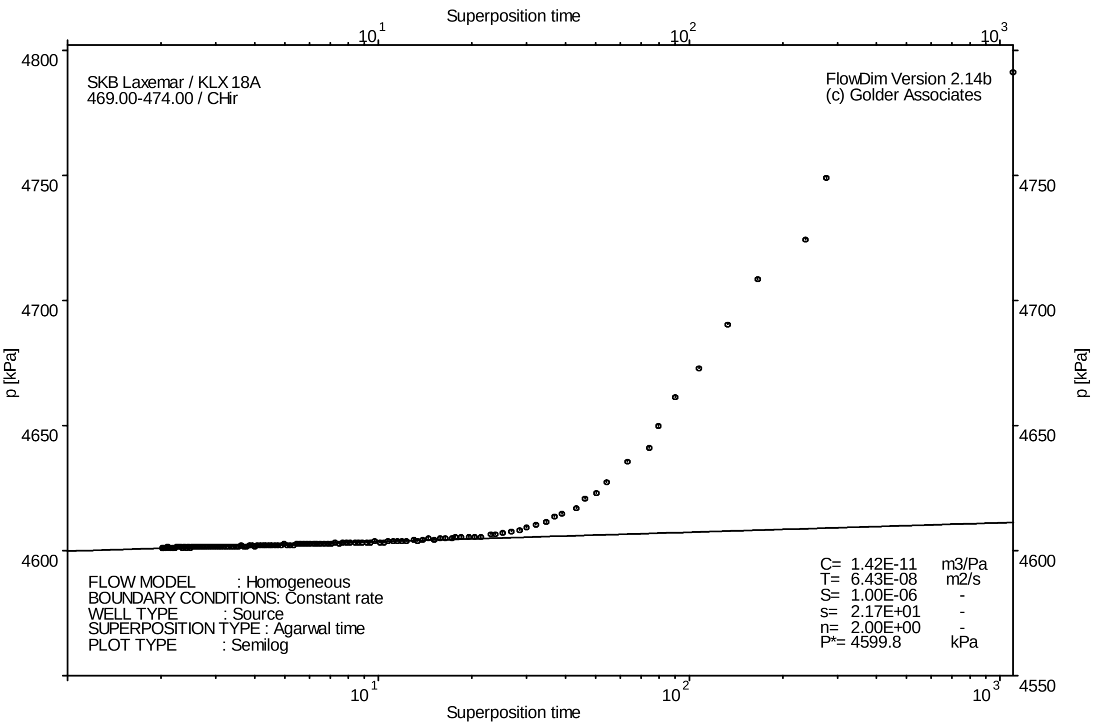
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

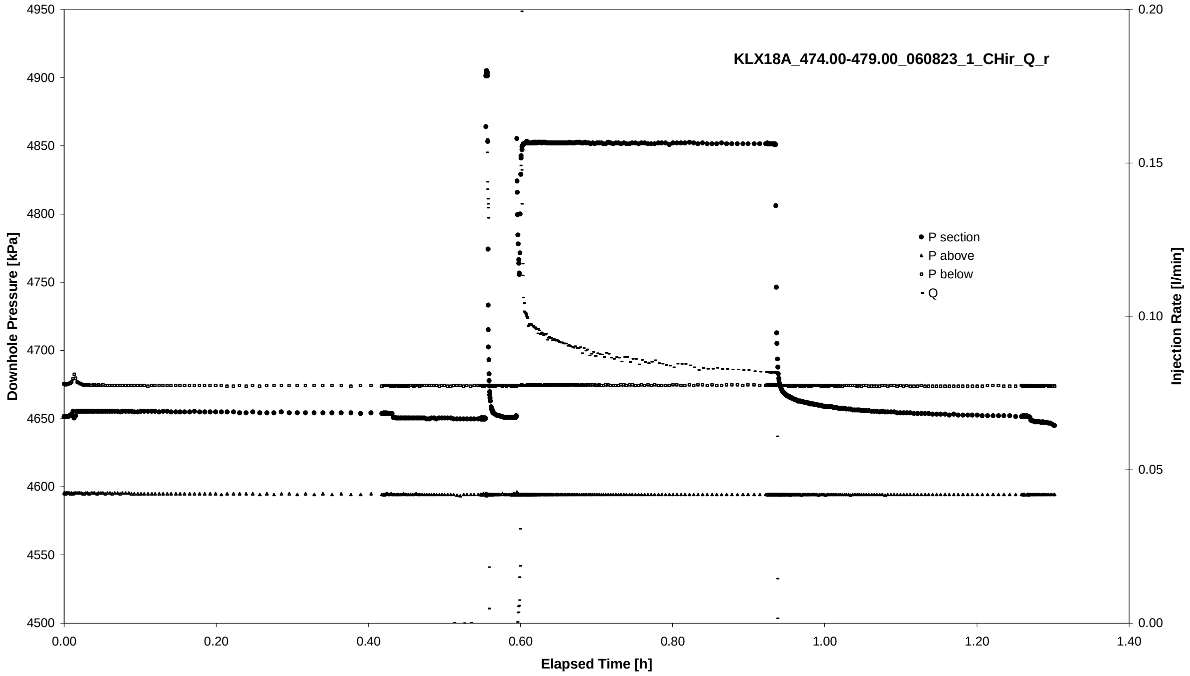


CHIR phase; HORNER match

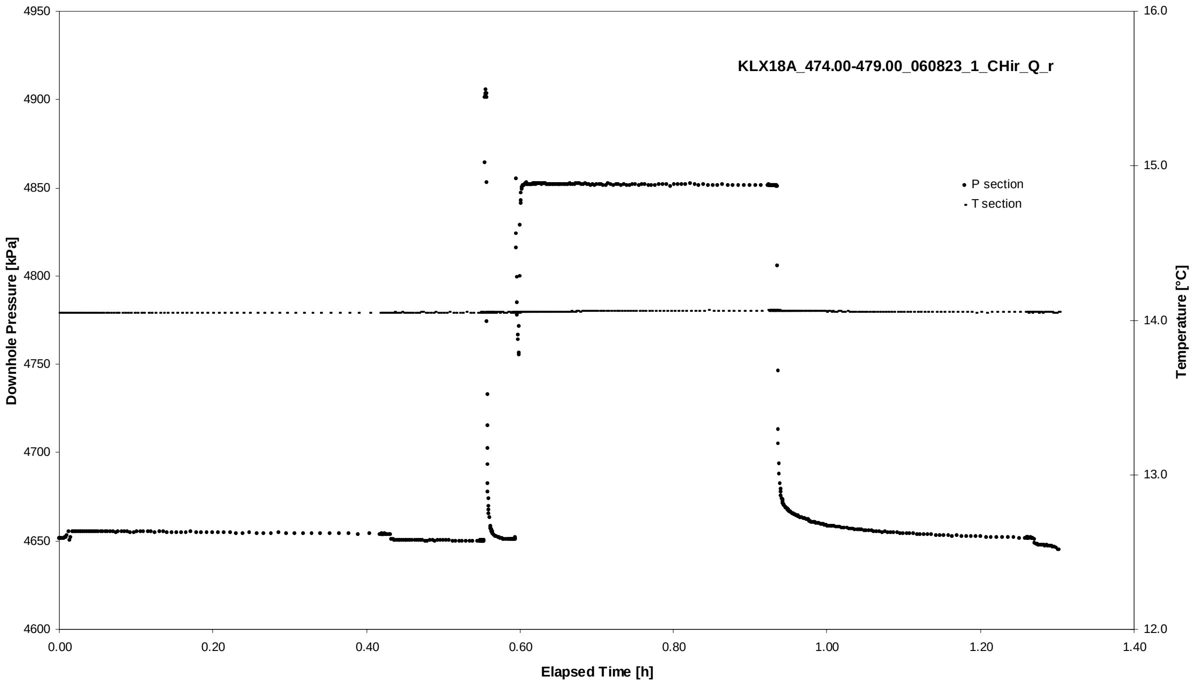
APPENDIX 2-66

Test 474.00 – 479.00 m

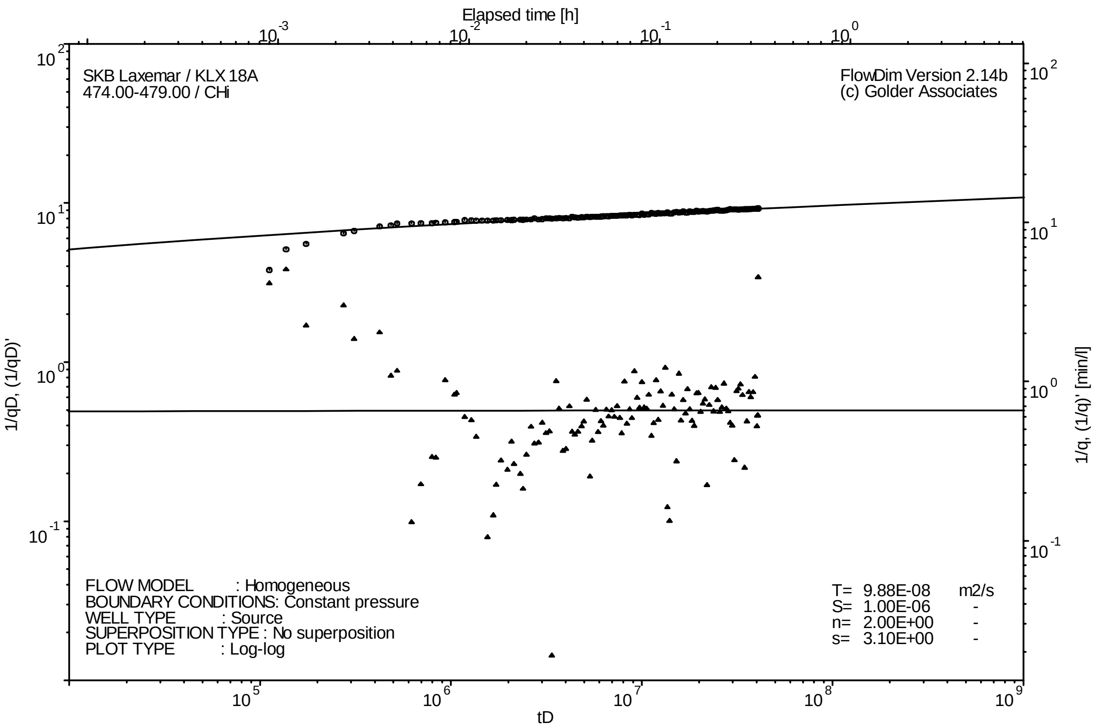
Analysis diagrams



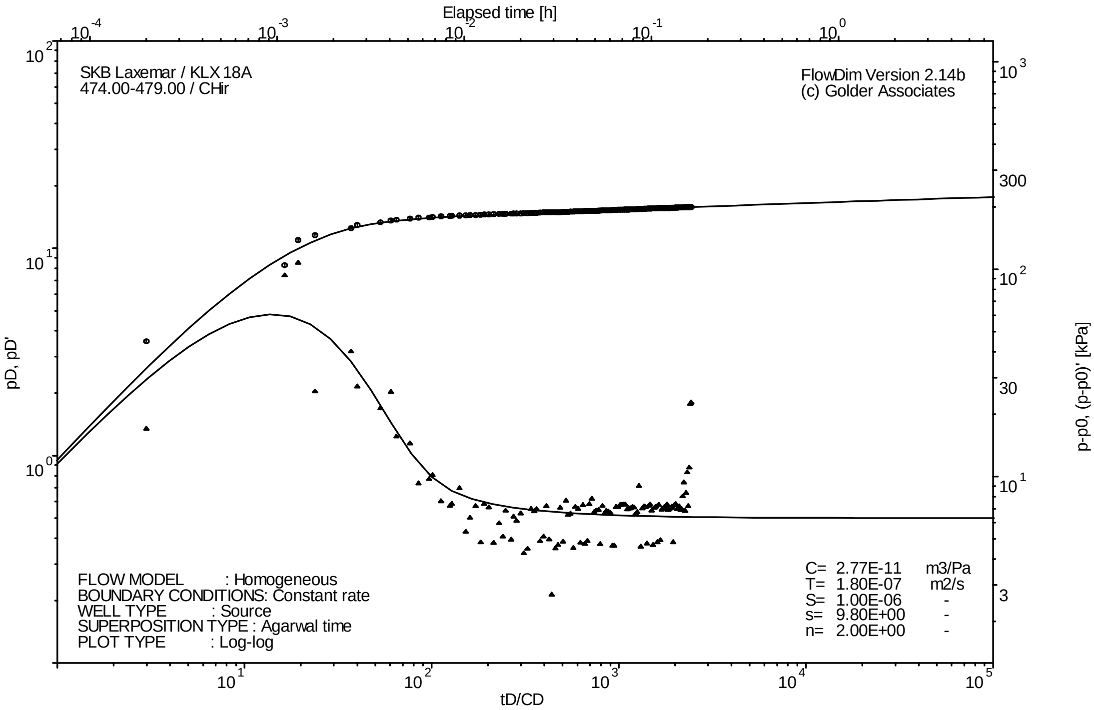
Pressure and flow rate vs. time; cartesian plot



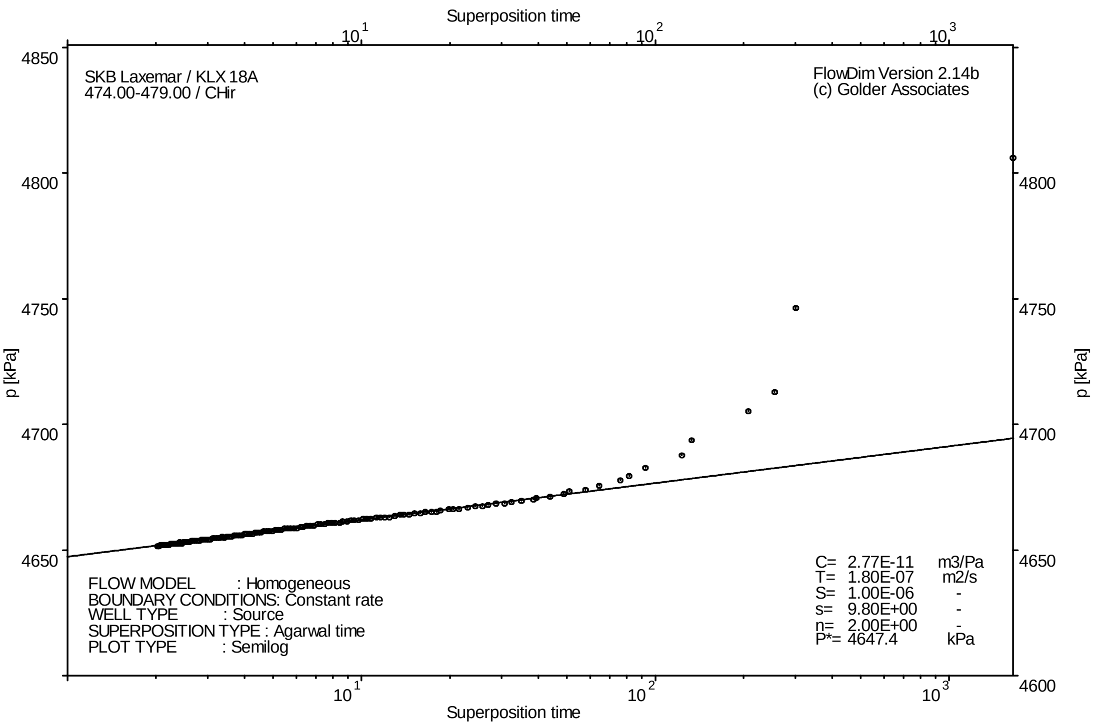
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

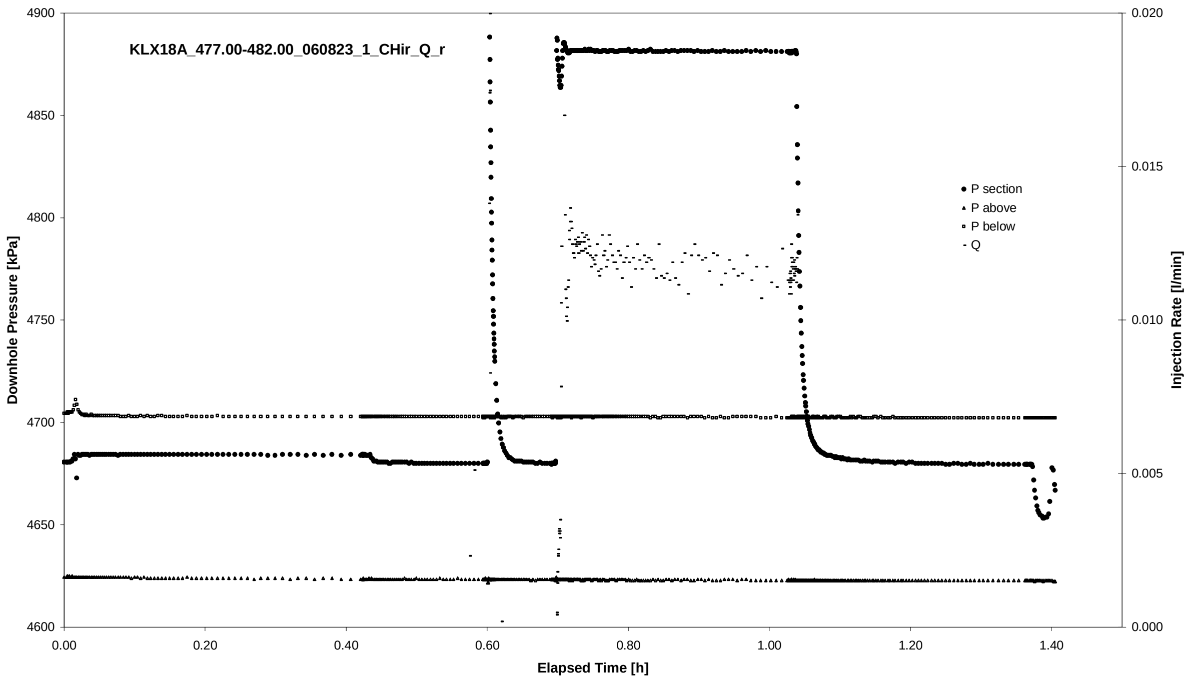


CHIR phase; HORNER match

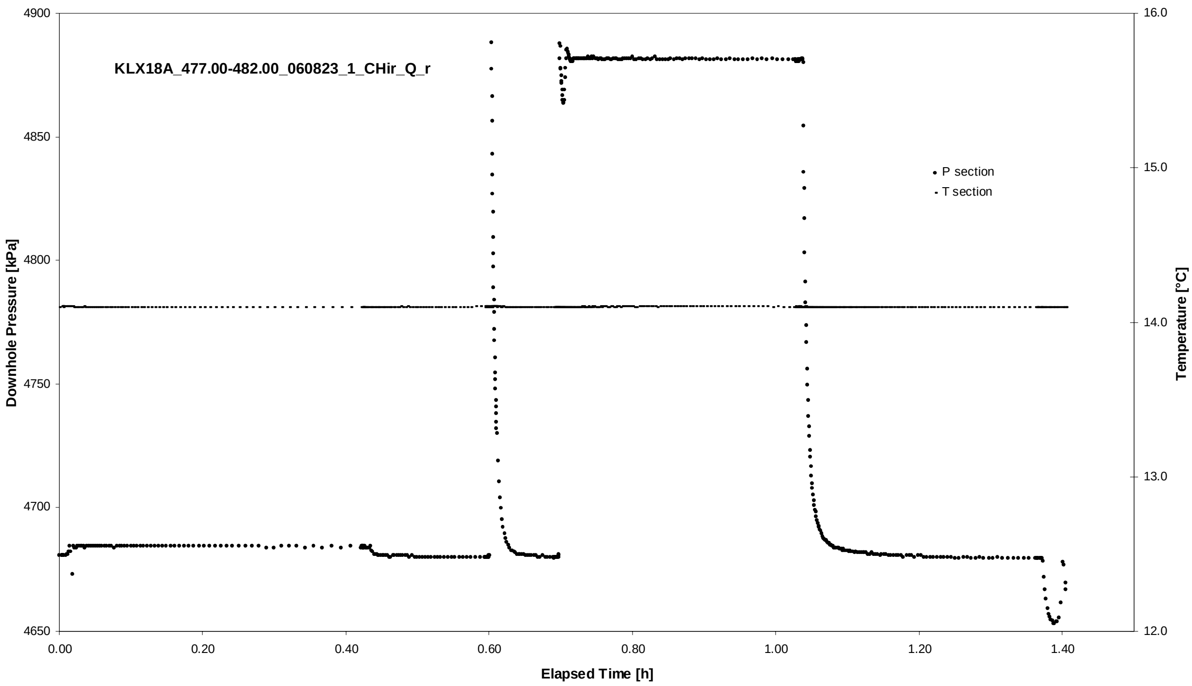
APPENDIX 2-67

Test 477.00 – 482.00 m

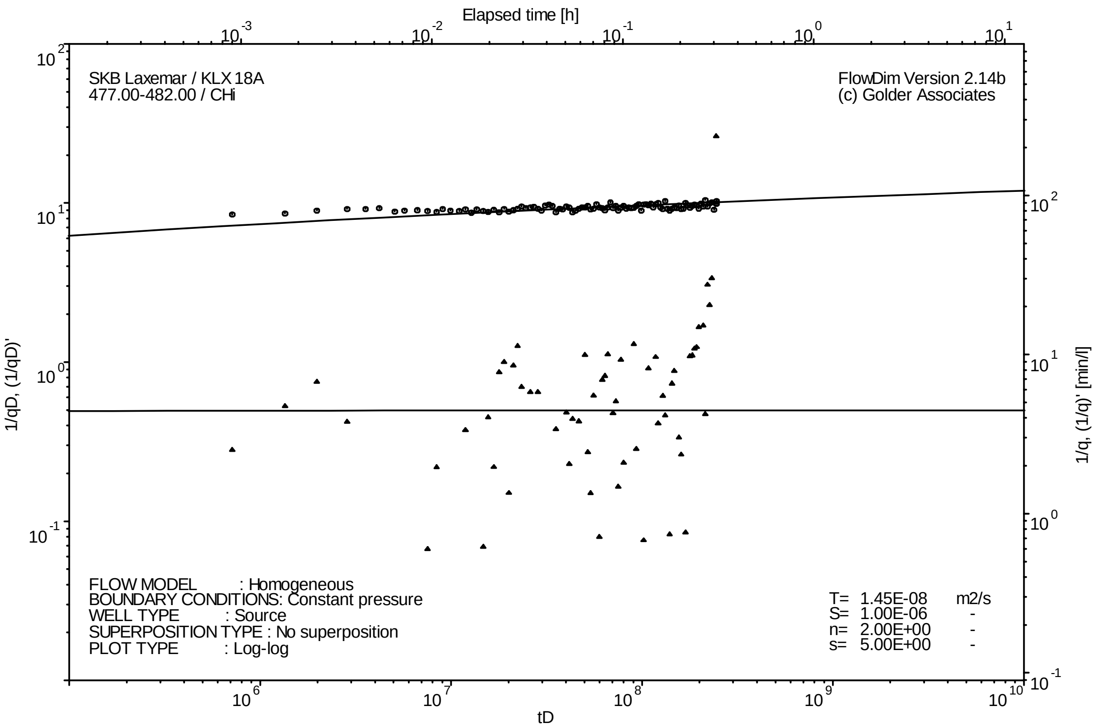
Analysis diagrams



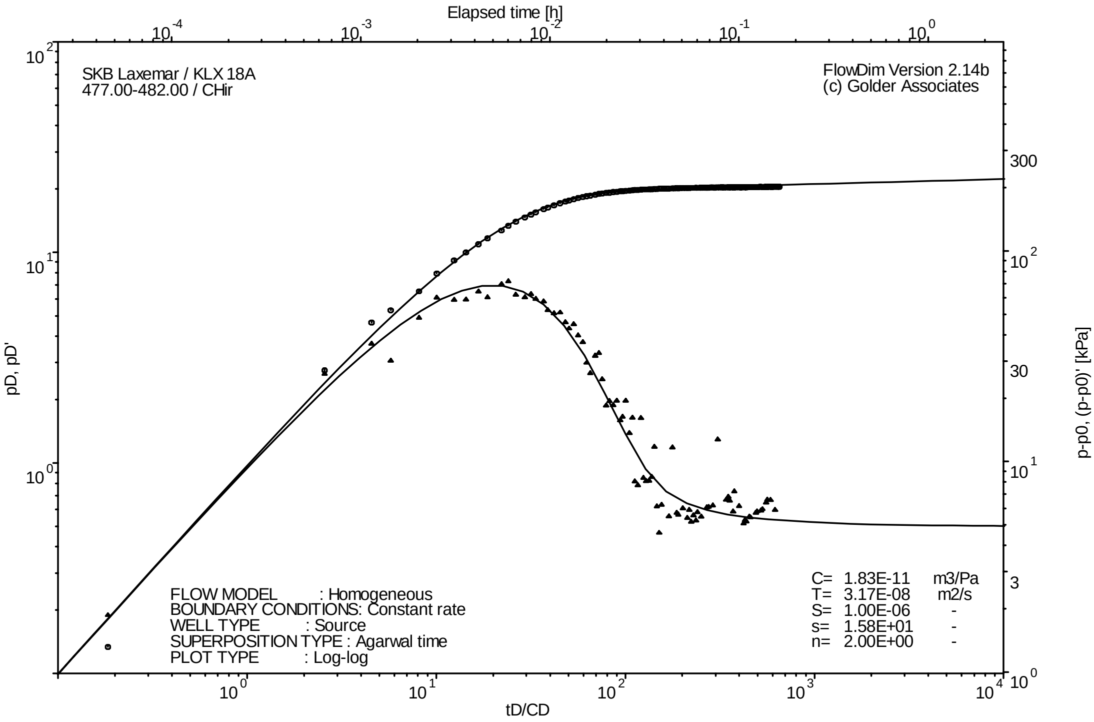
Pressure and flow rate vs. time; cartesian plot



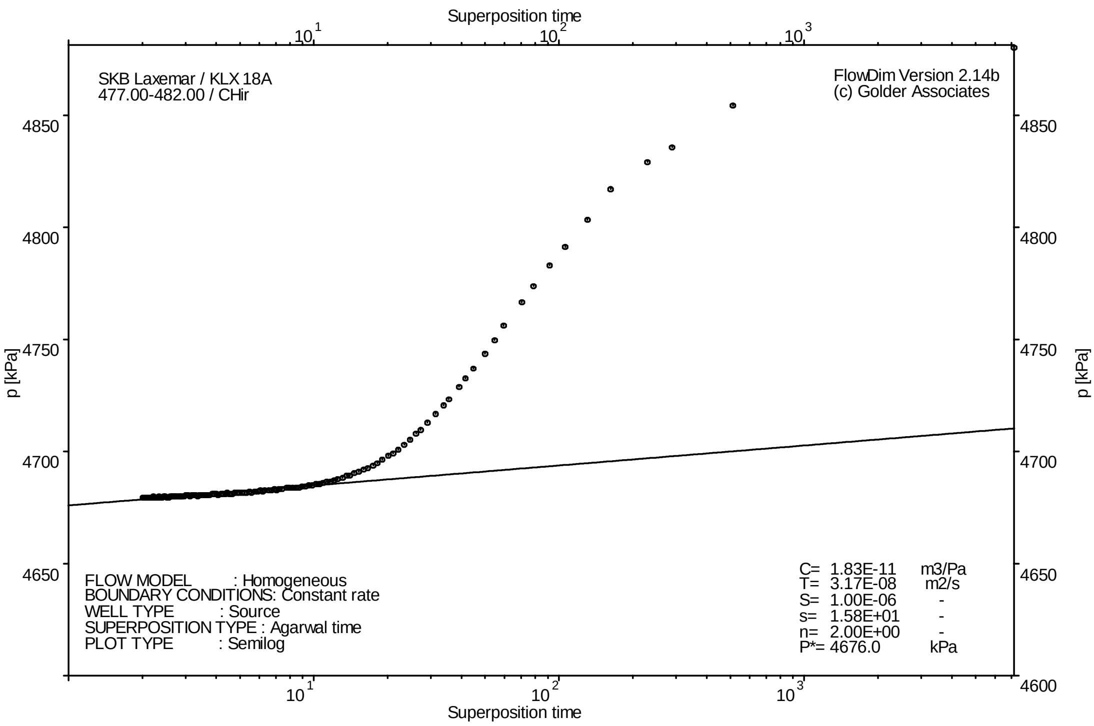
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

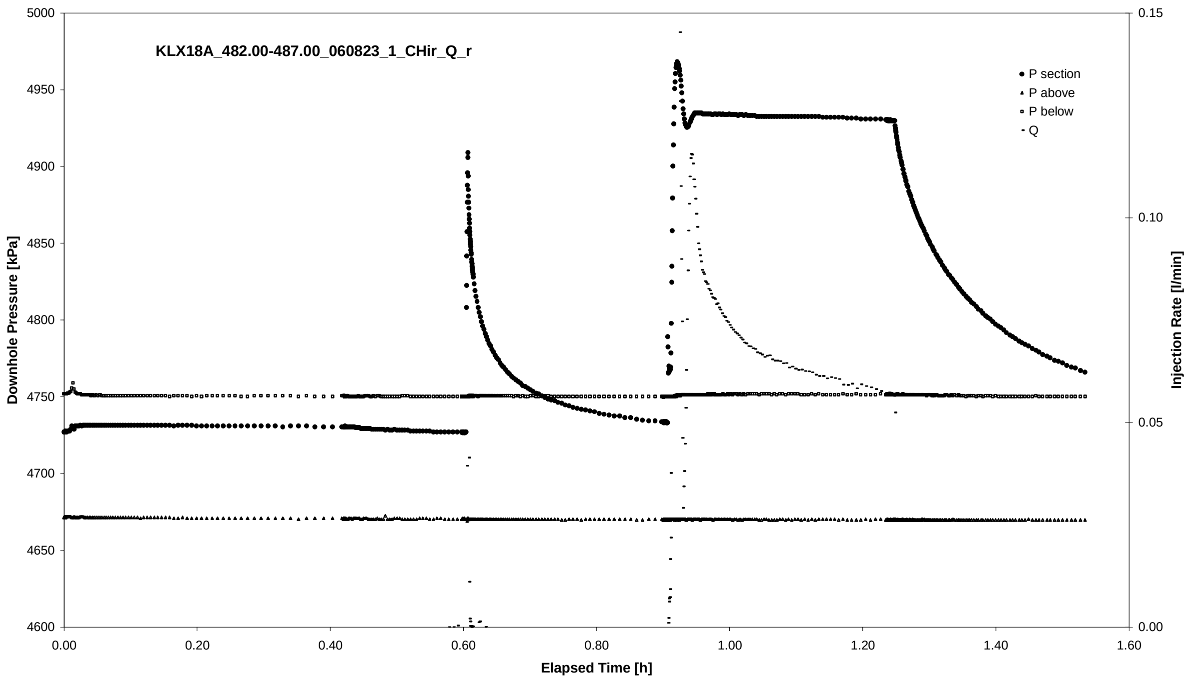


CHIR phase; HORNER match

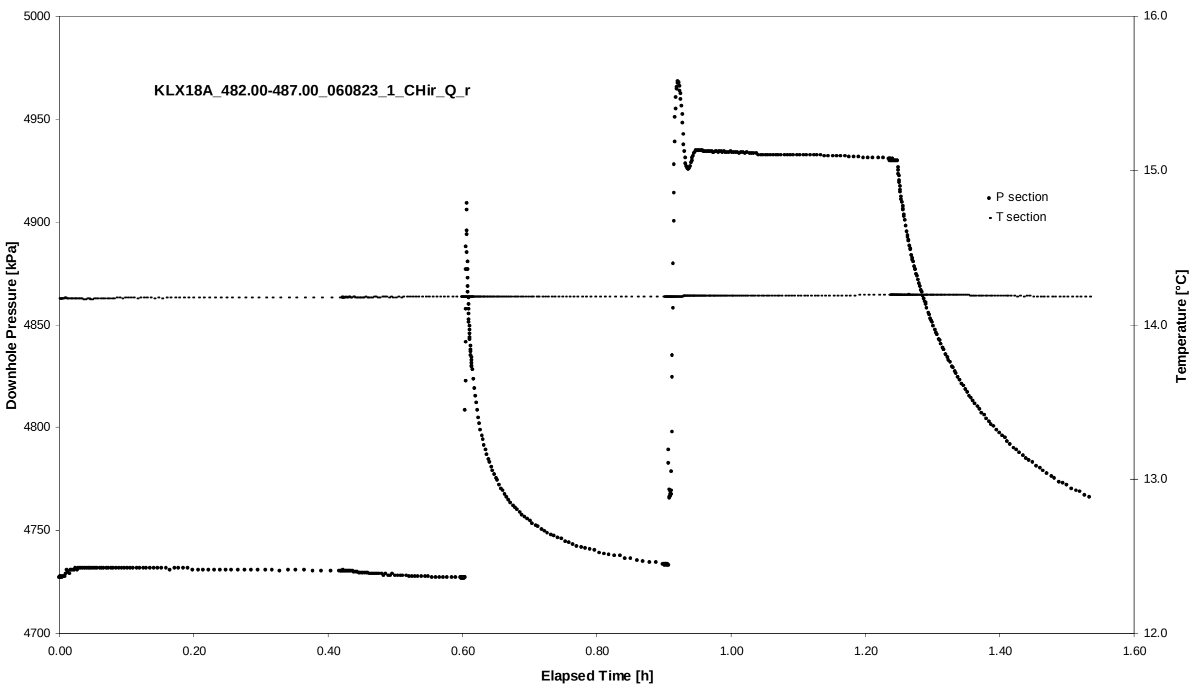
APPENDIX 2-68

Test 482.00 – 487.00 m

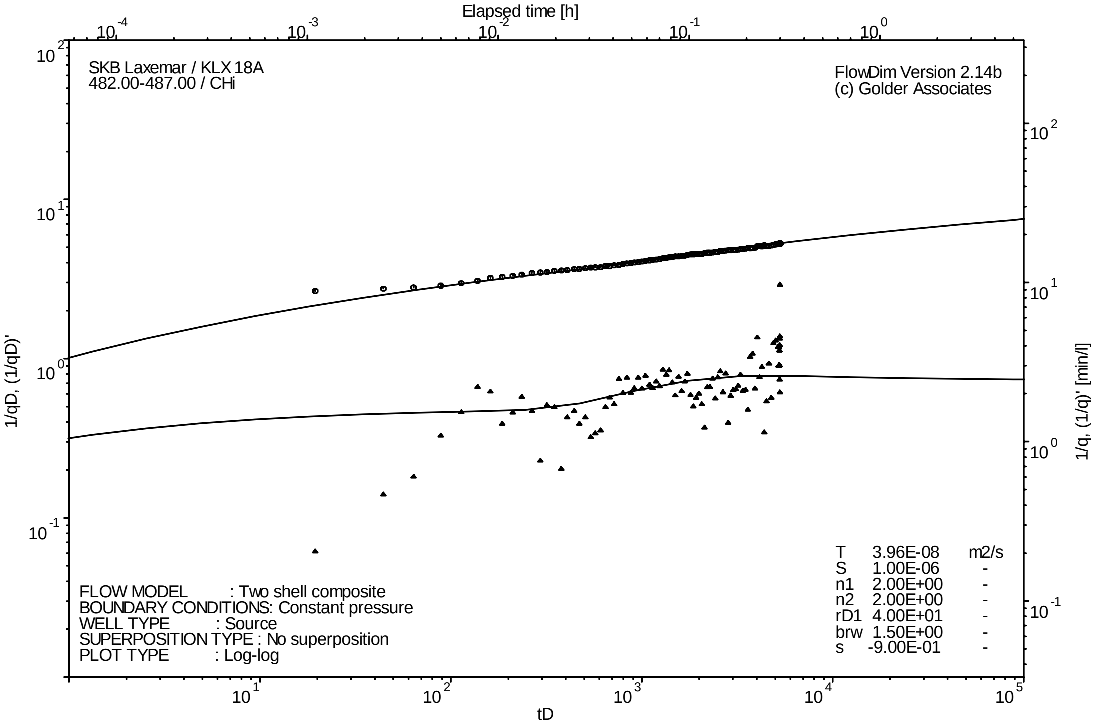
Analysis diagrams



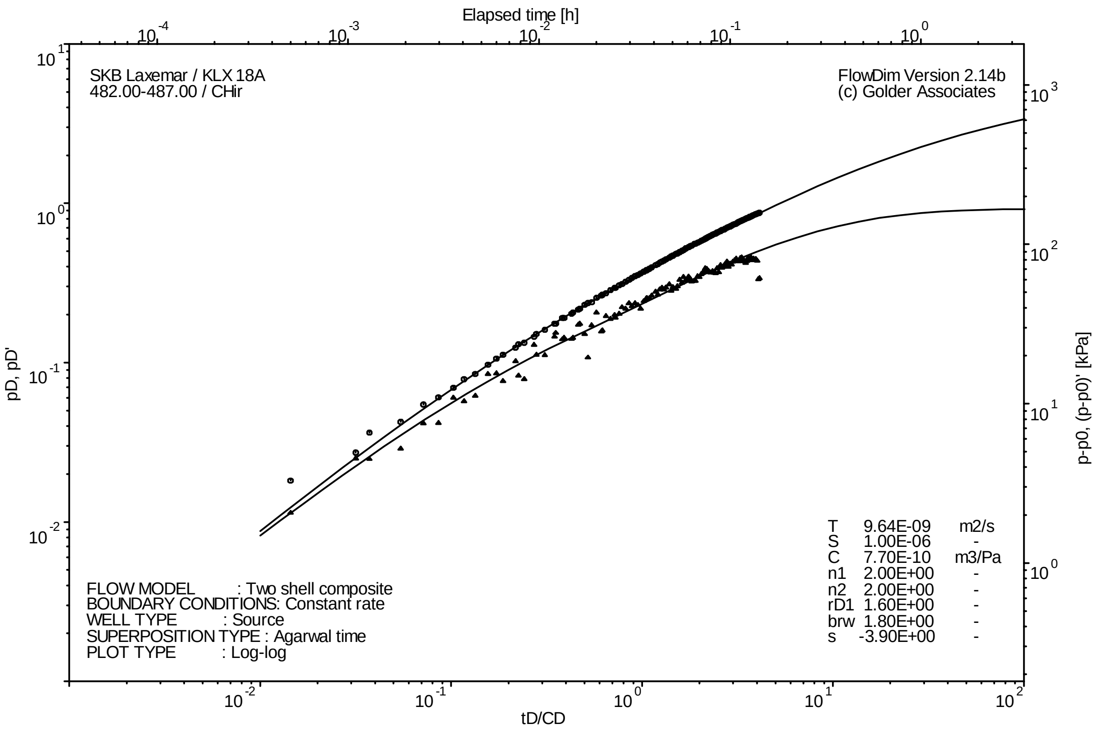
Pressure and flow rate vs. time; cartesian plot



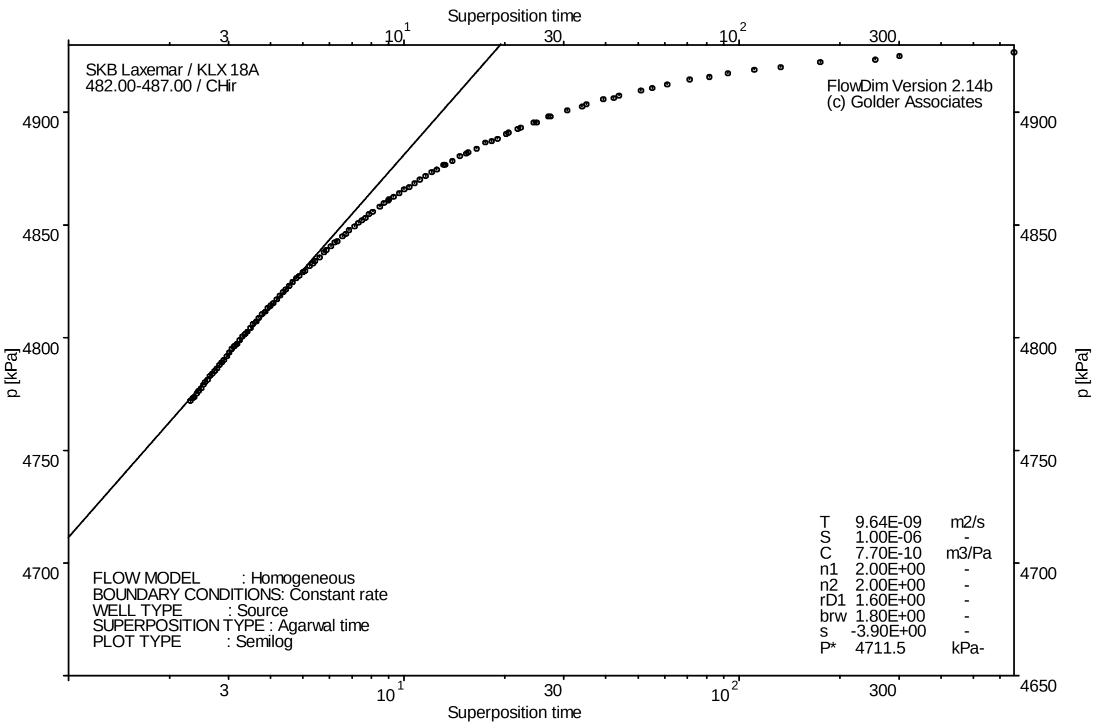
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

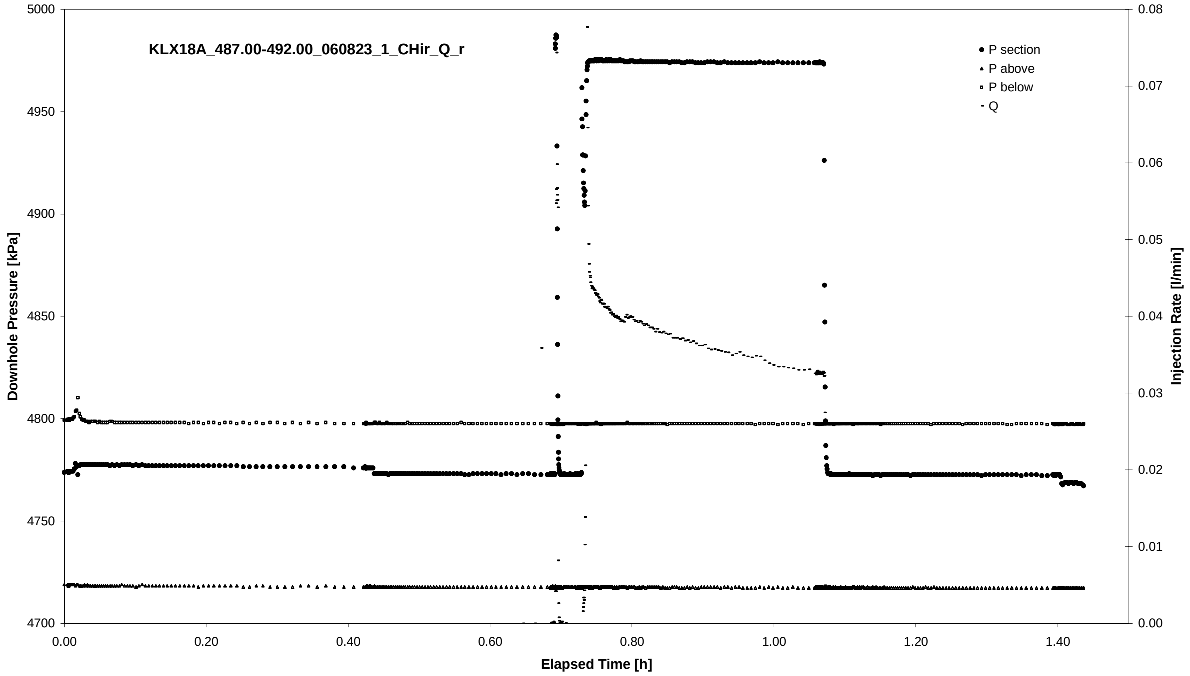


CHIR phase; HORNER match

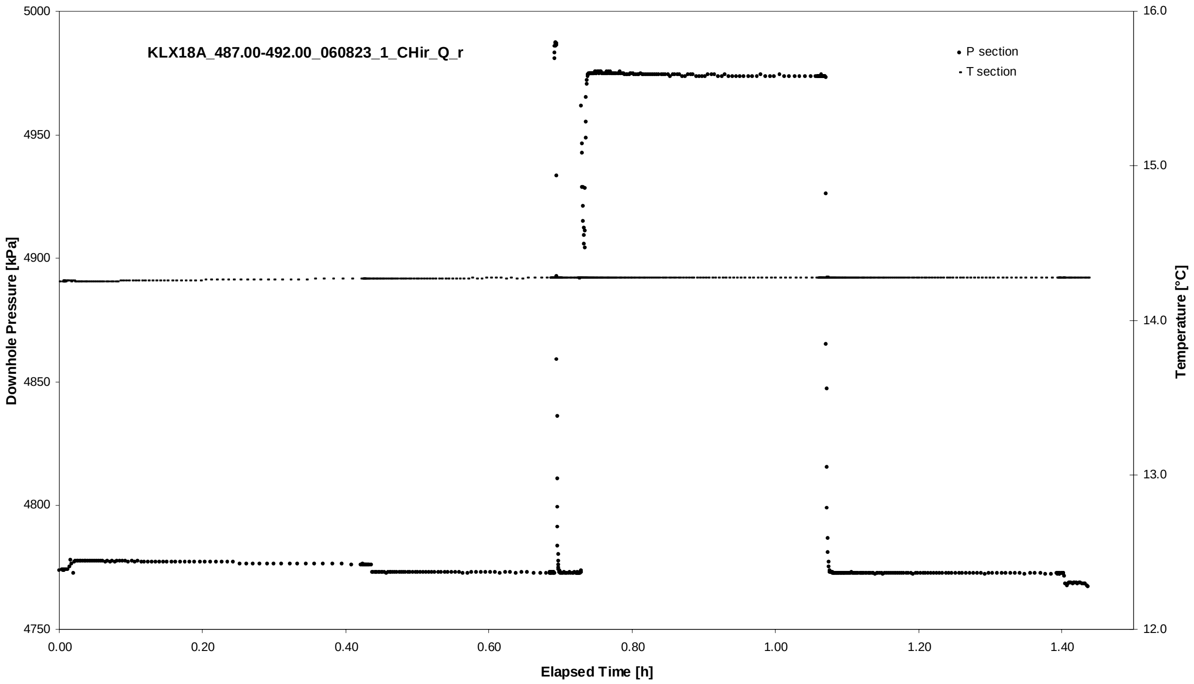
APPENDIX 2-69

Test 487.00 – 492.00 m

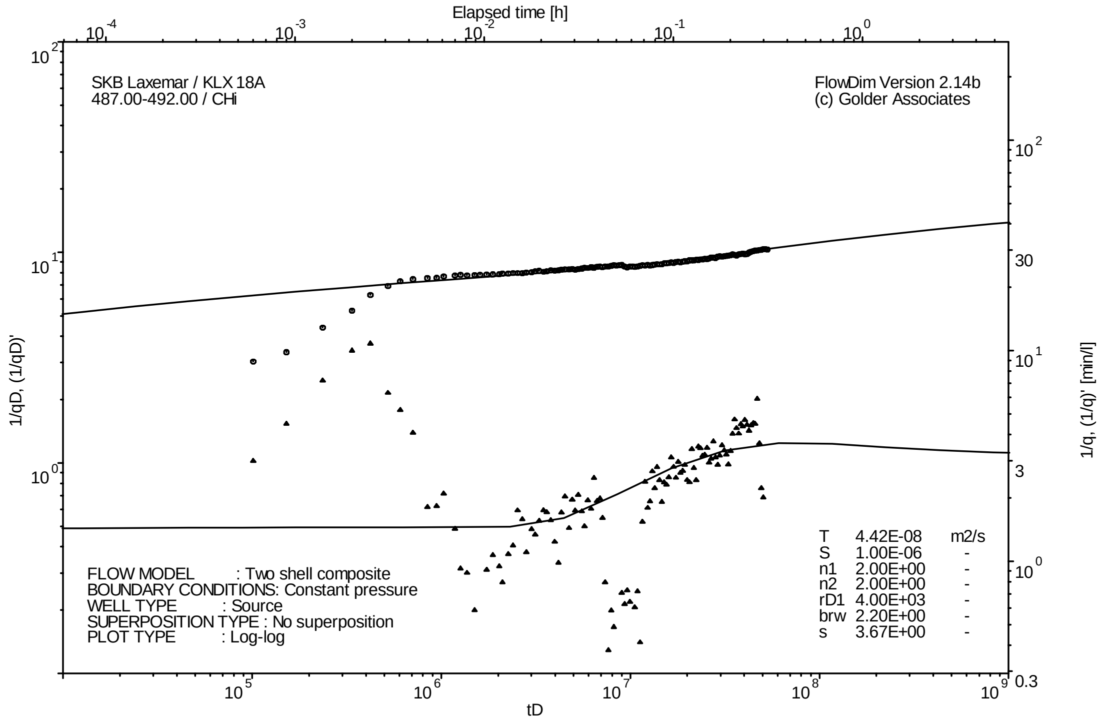
Analysis diagrams



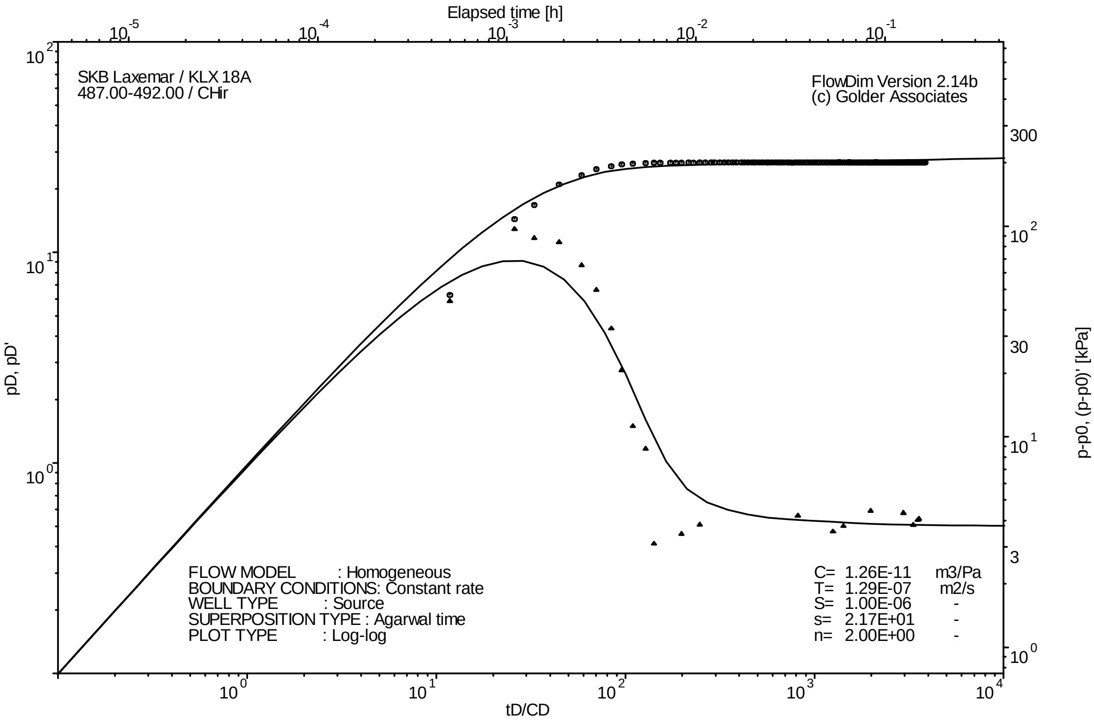
Pressure and flow rate vs. time; cartesian plot



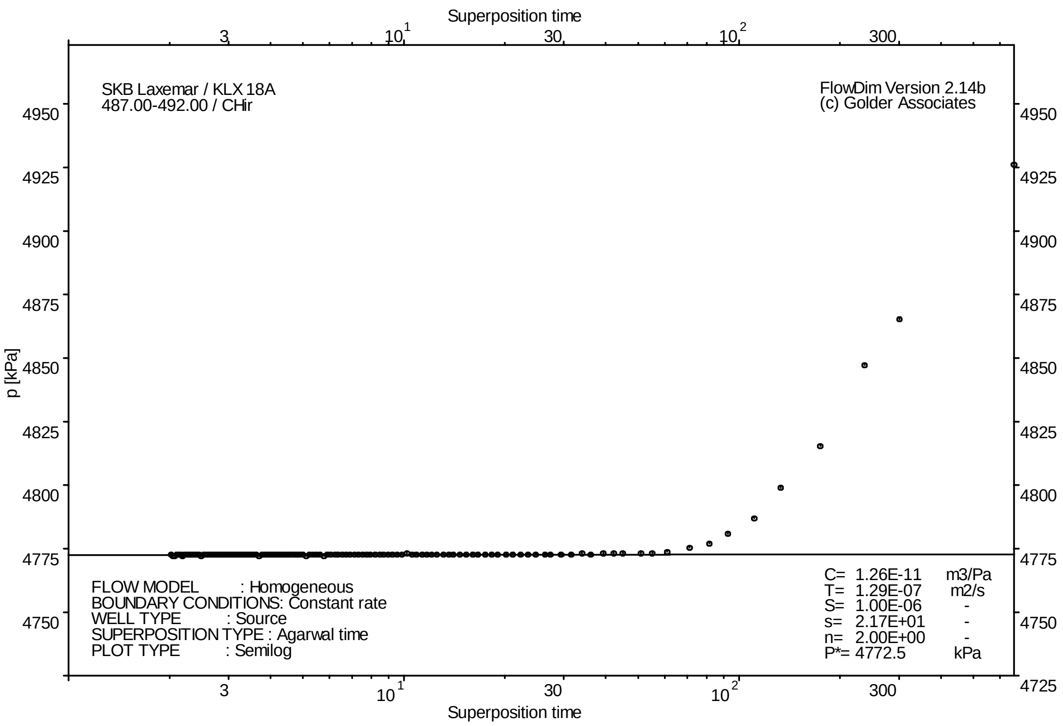
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

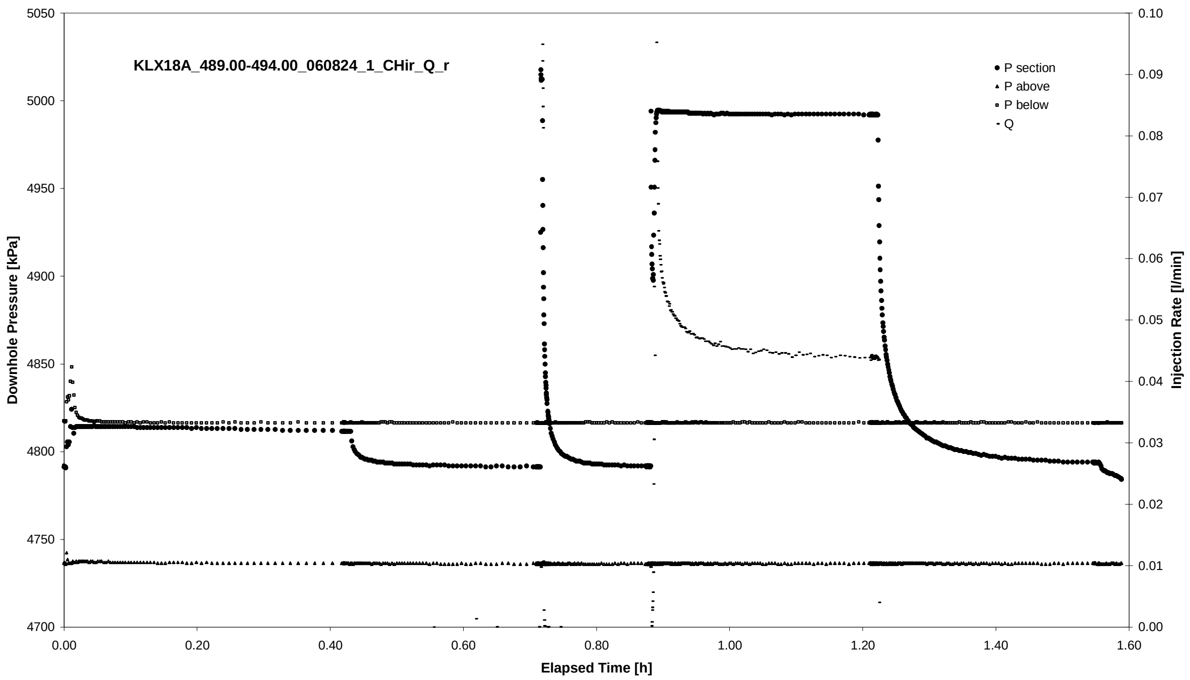


CHIR phase; HORNER match

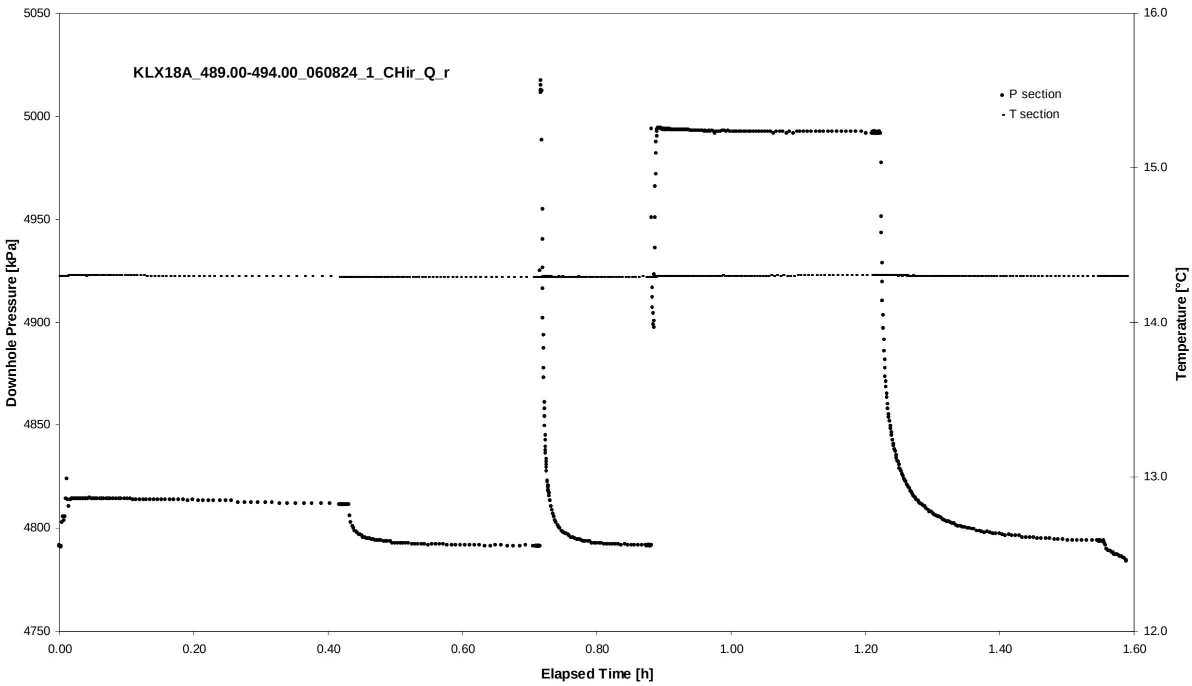
APPENDIX 2-70

Test 489.00 – 494.00 m

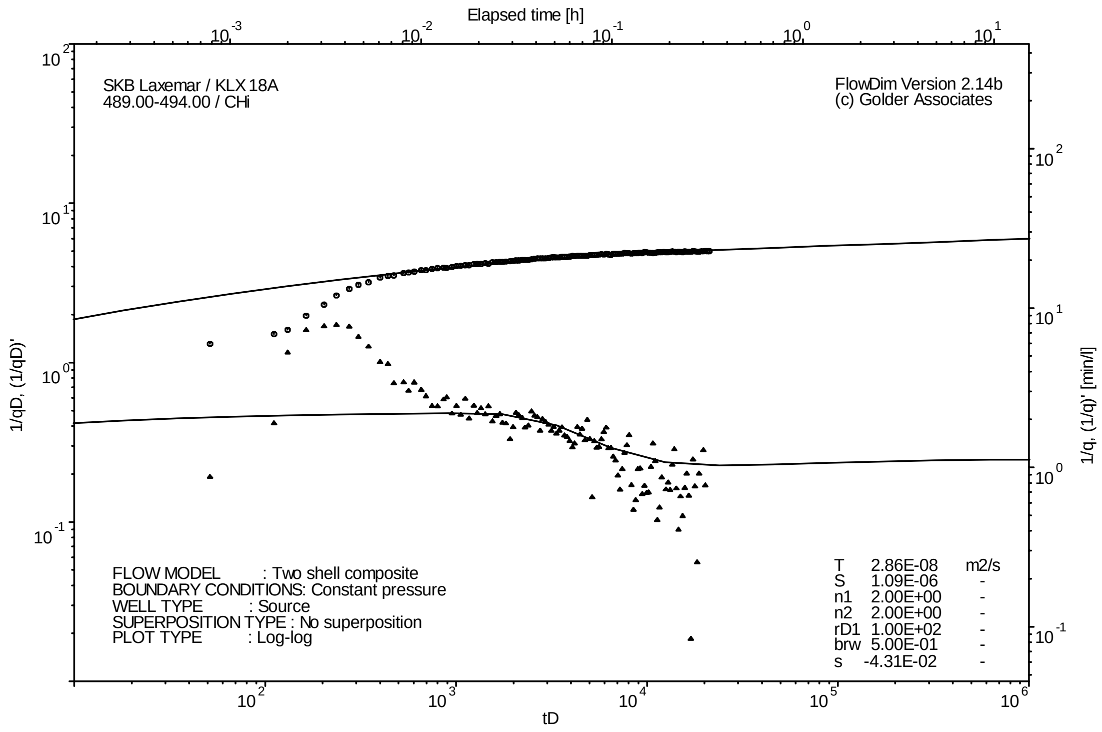
Analysis diagrams



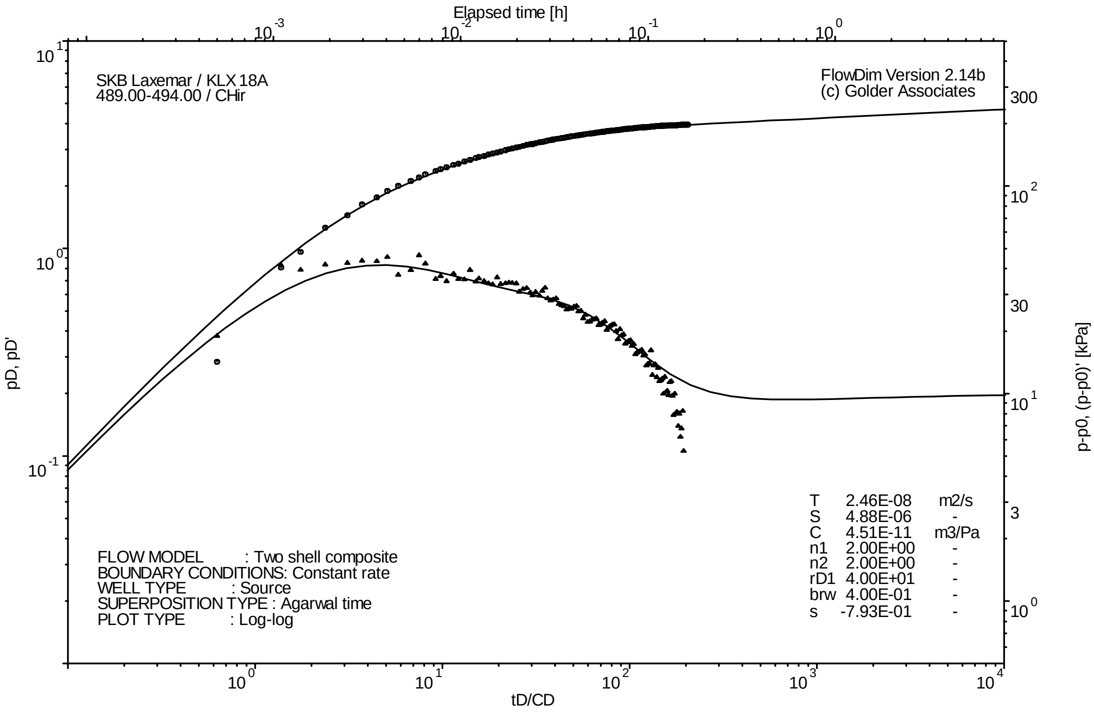
Pressure and flow rate vs. time; cartesian plot



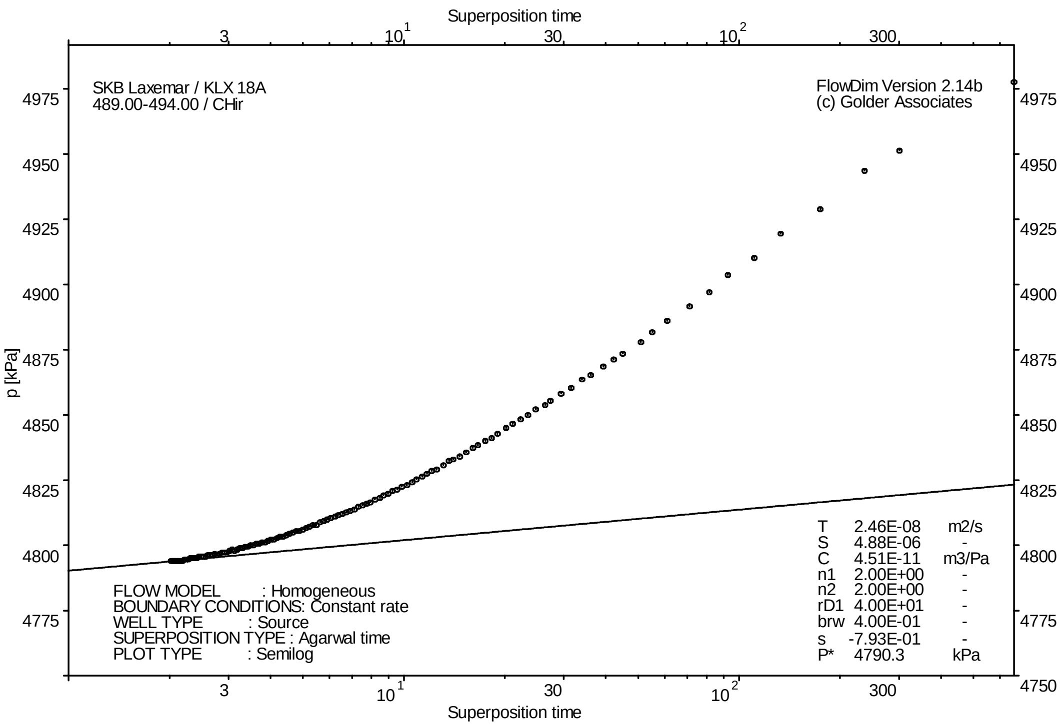
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

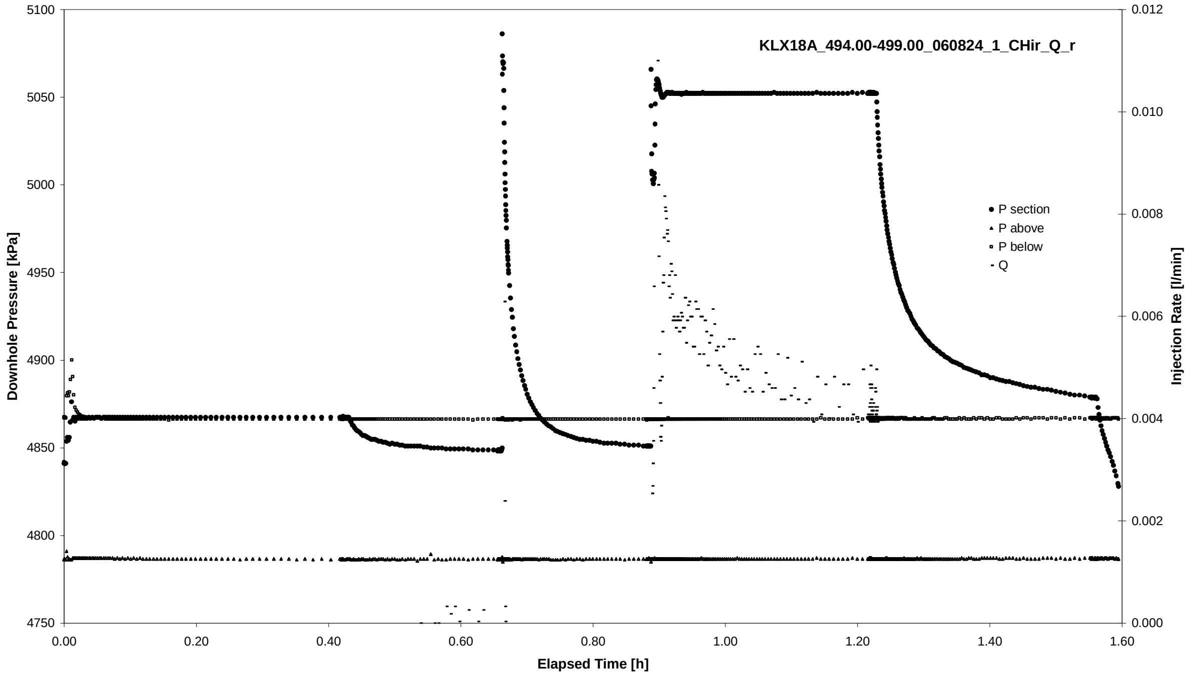


CHIR phase; HORNER match

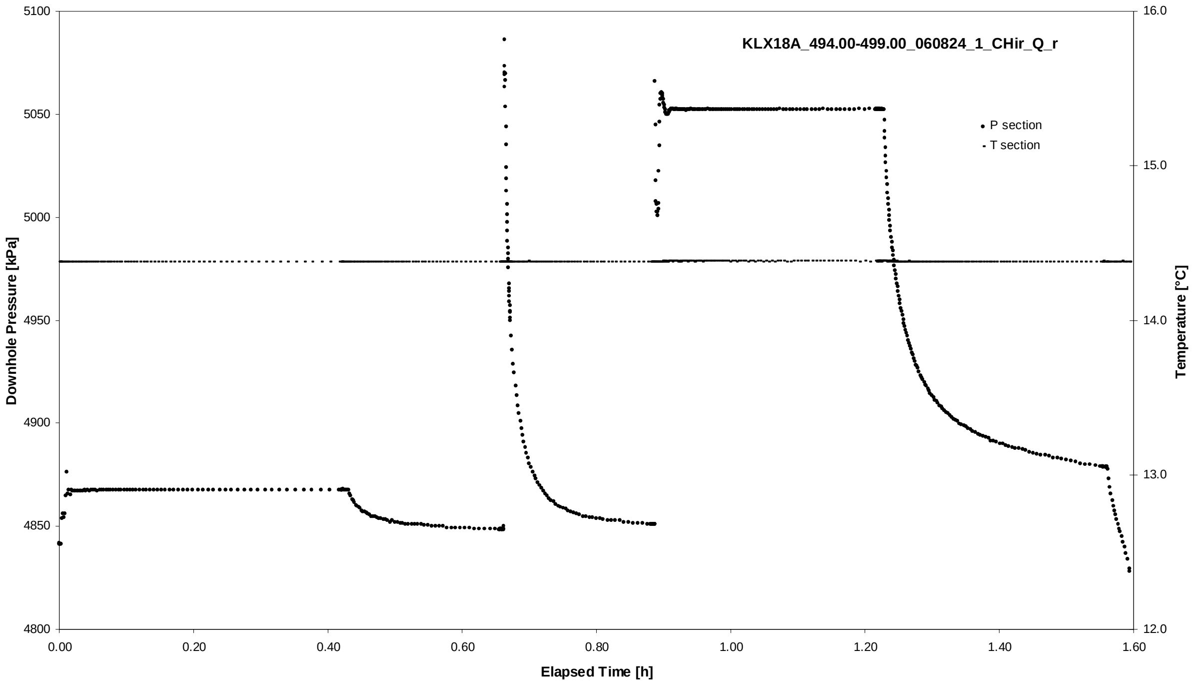
APPENDIX 2-71

Test 494.00 – 499.00 m

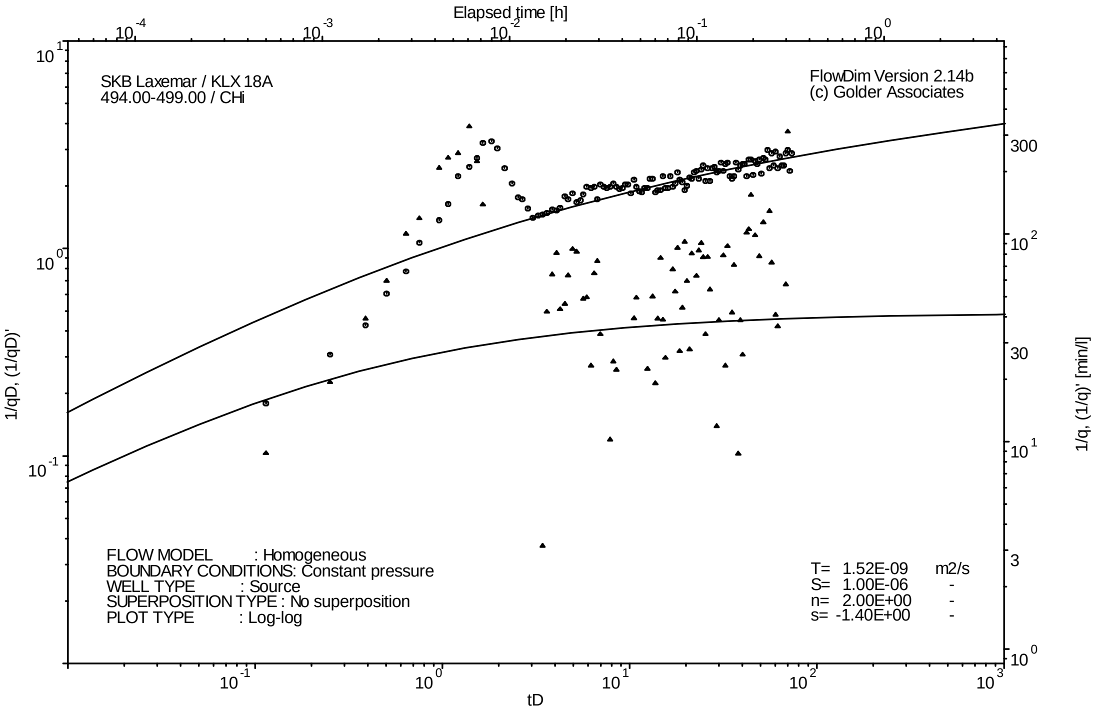
Analysis diagrams



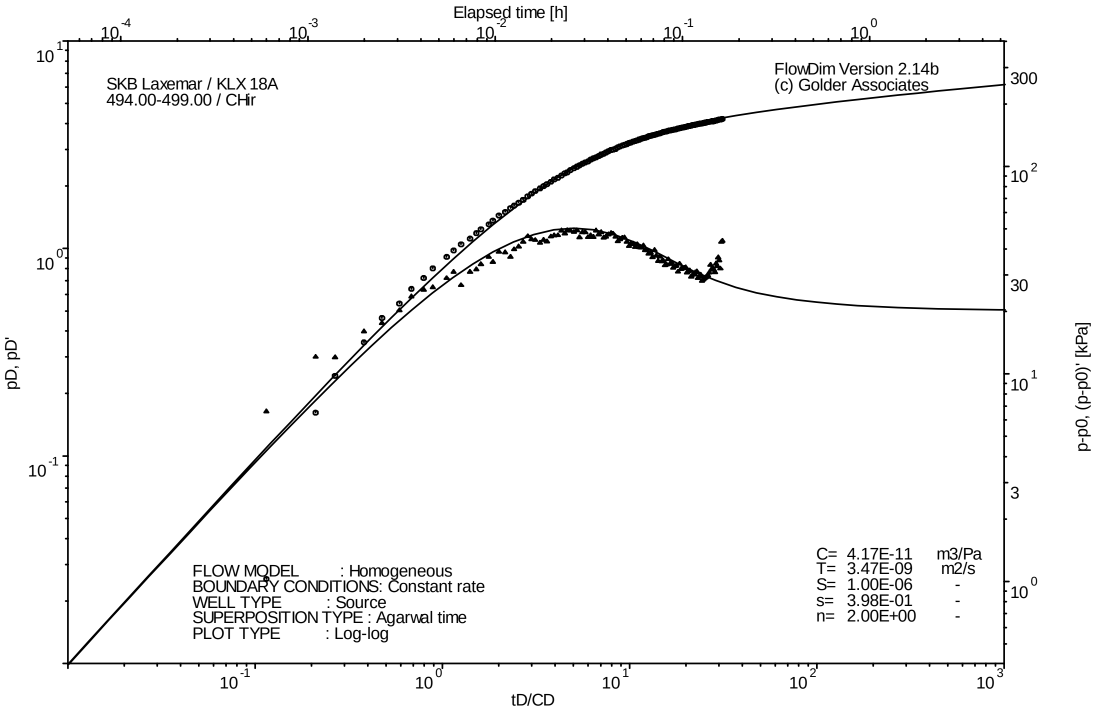
Pressure and flow rate vs. time; cartesian plot



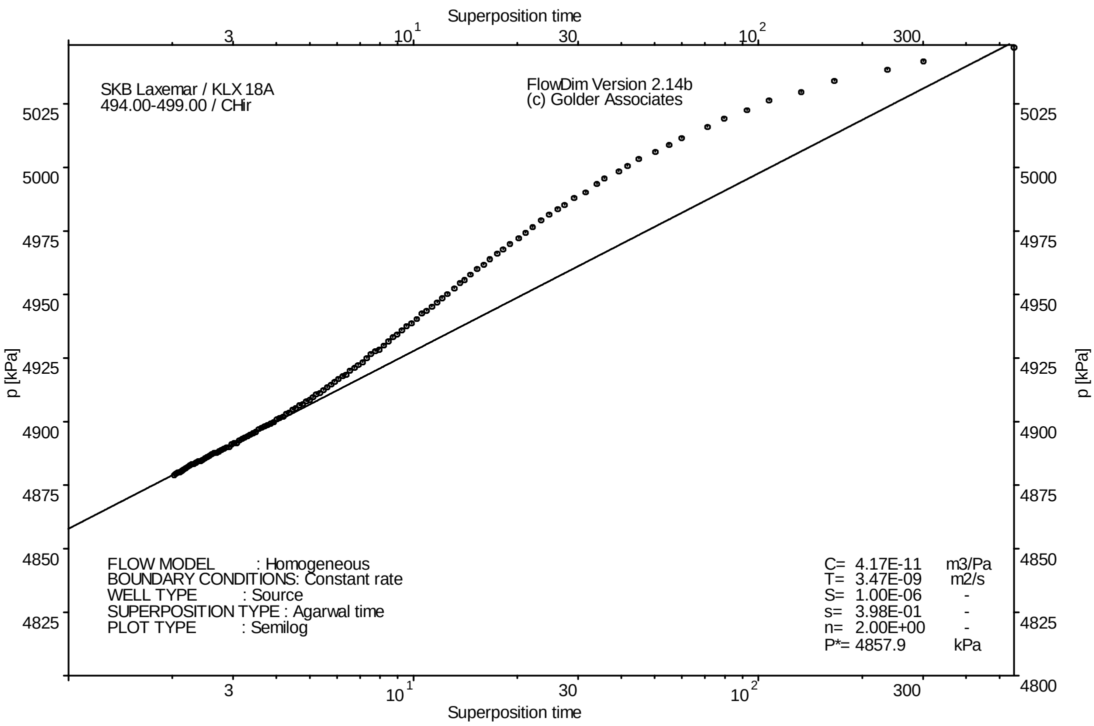
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

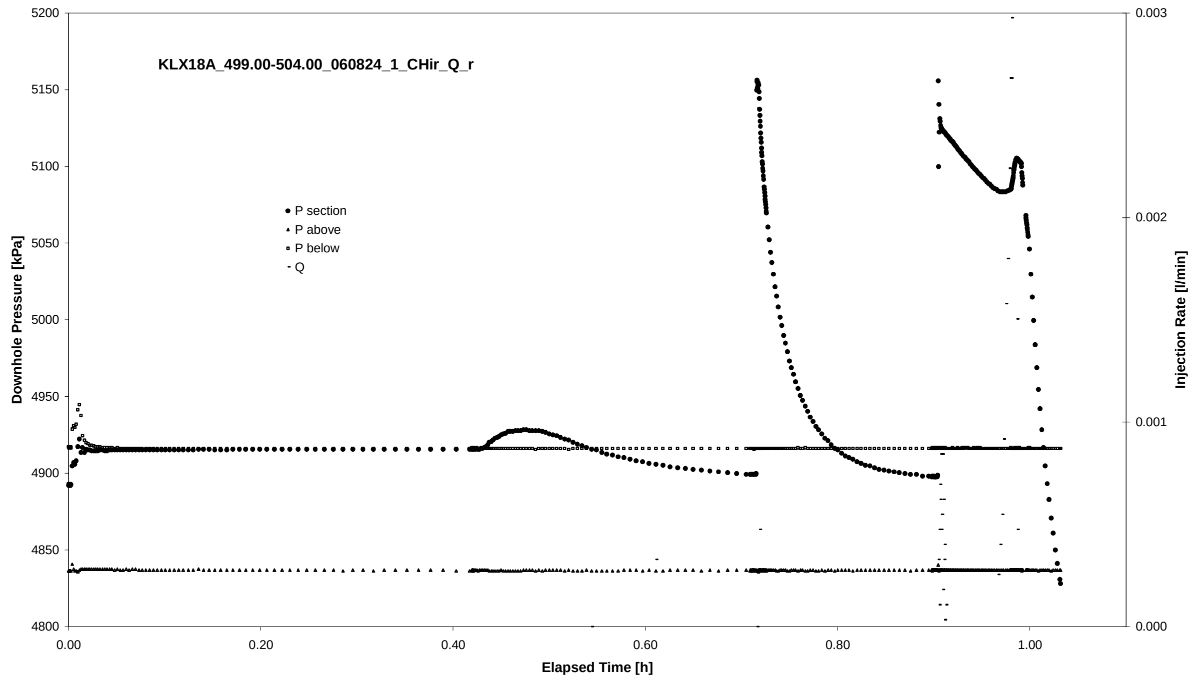


CHIR phase; HORNER match

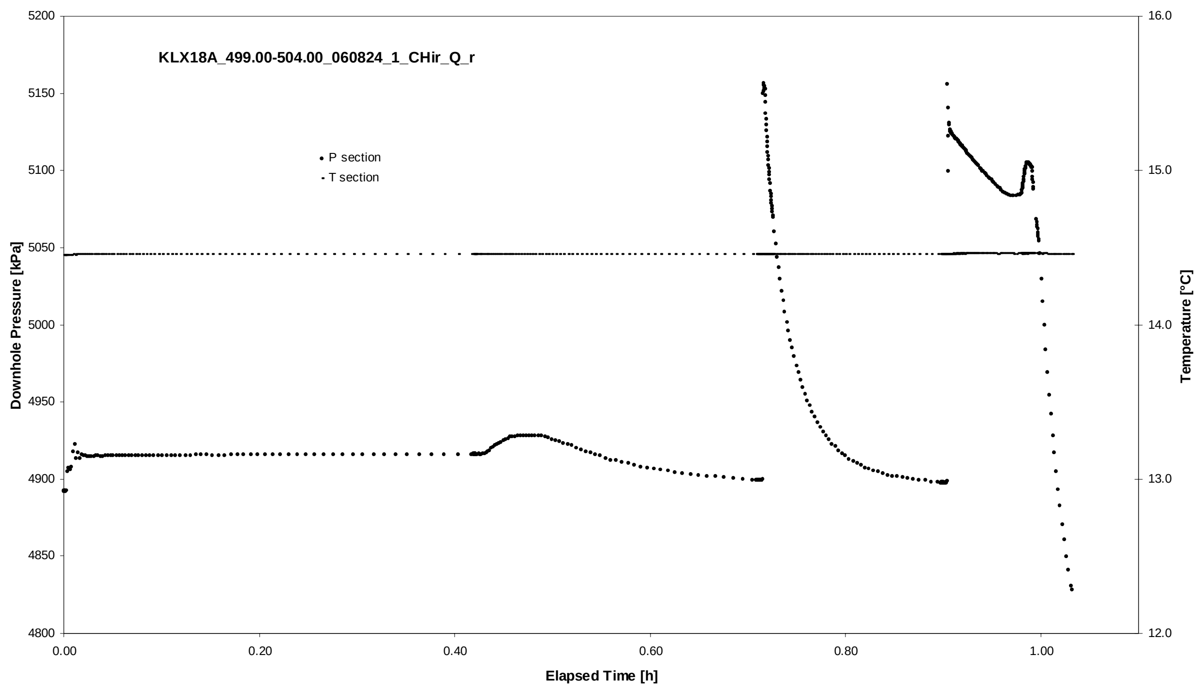
APPENDIX 2-72

Test 499.00 – 504.00 m

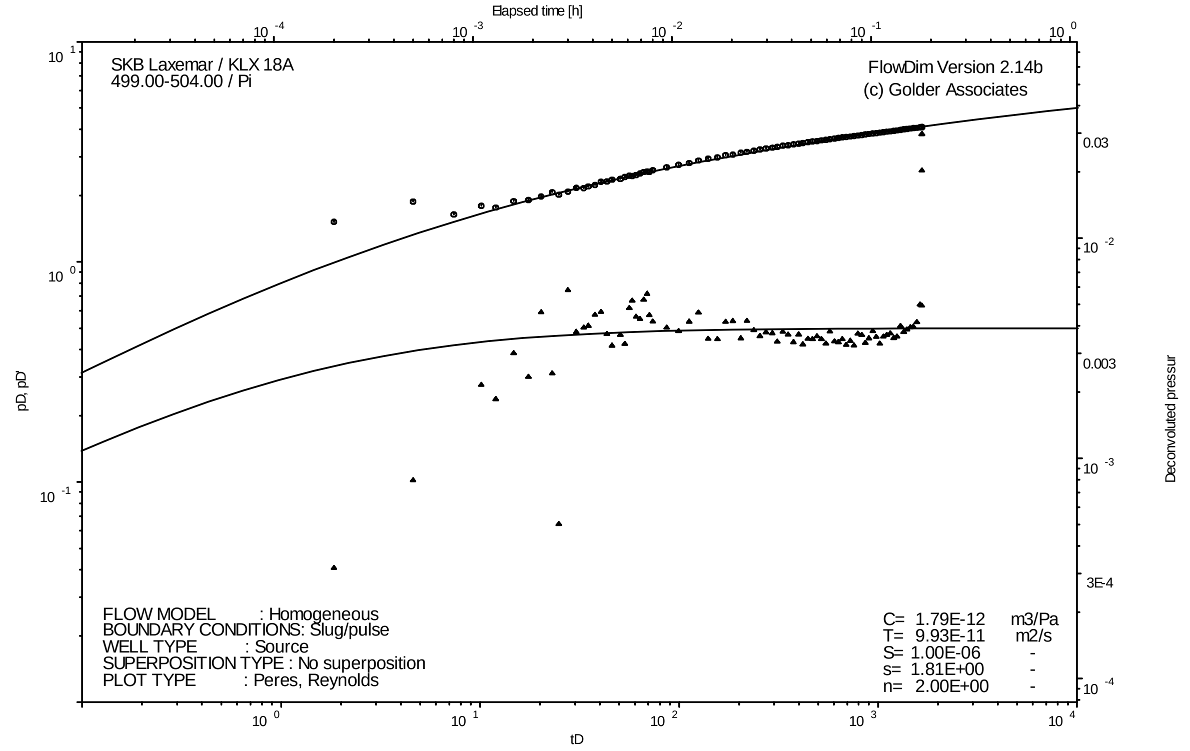
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

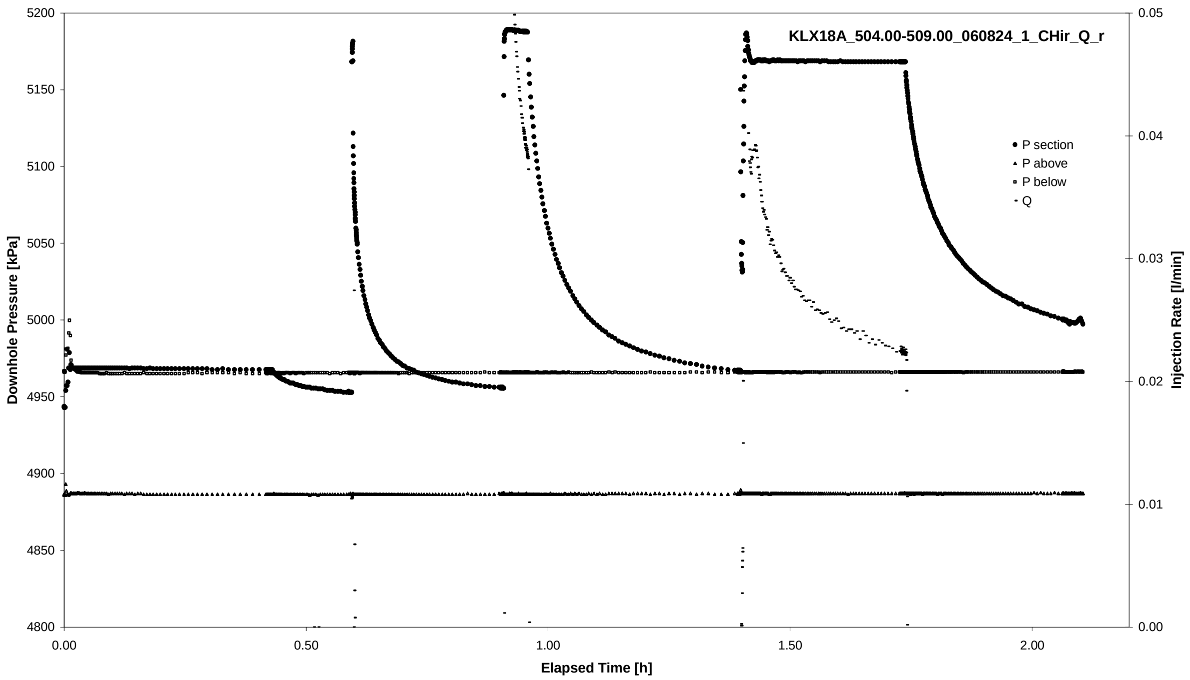


Pulse injection; deconvolution match

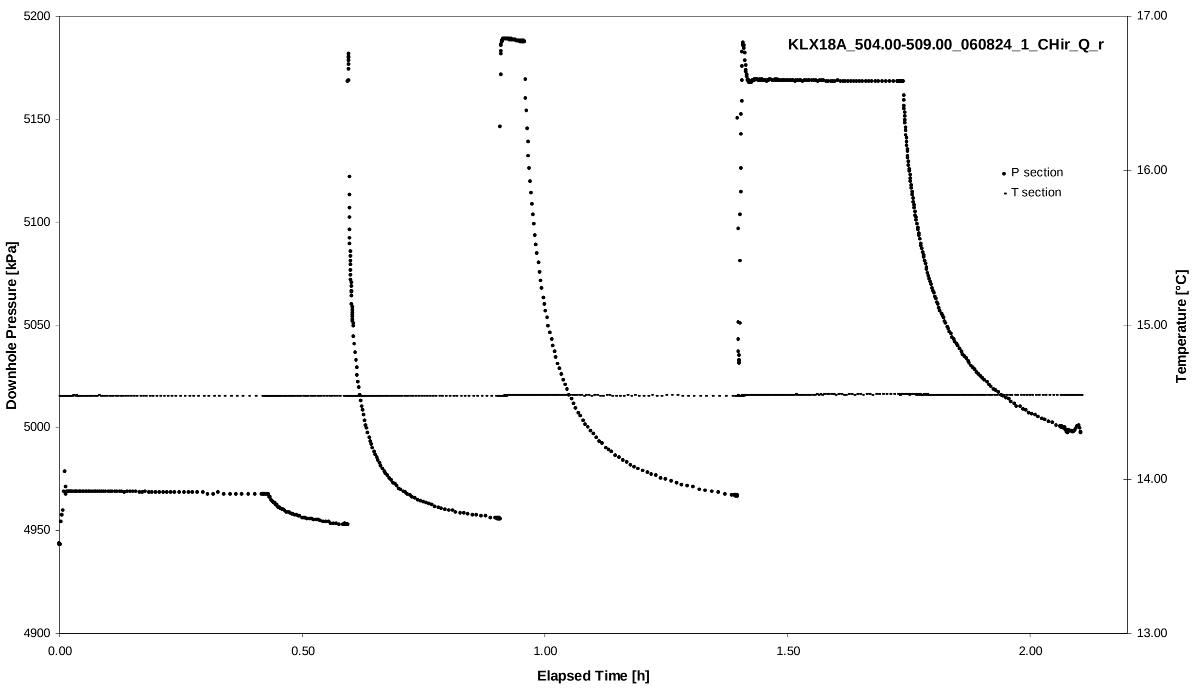
APPENDIX 2-73

Test 504.00 – 509.00 m

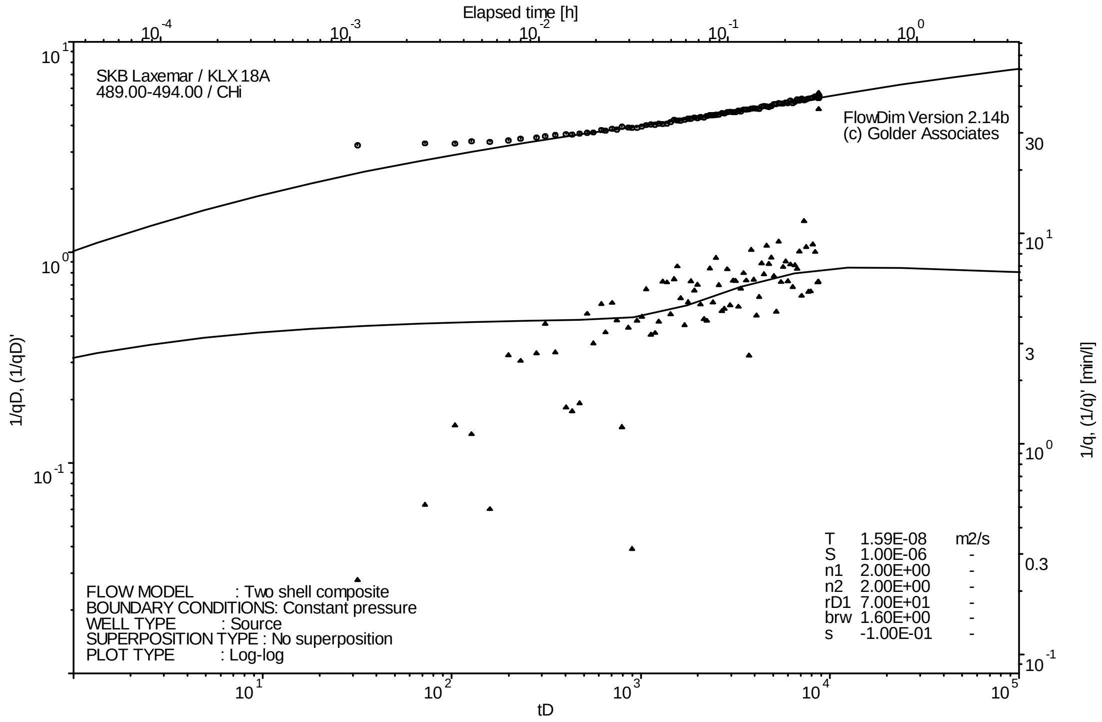
Analysis diagrams



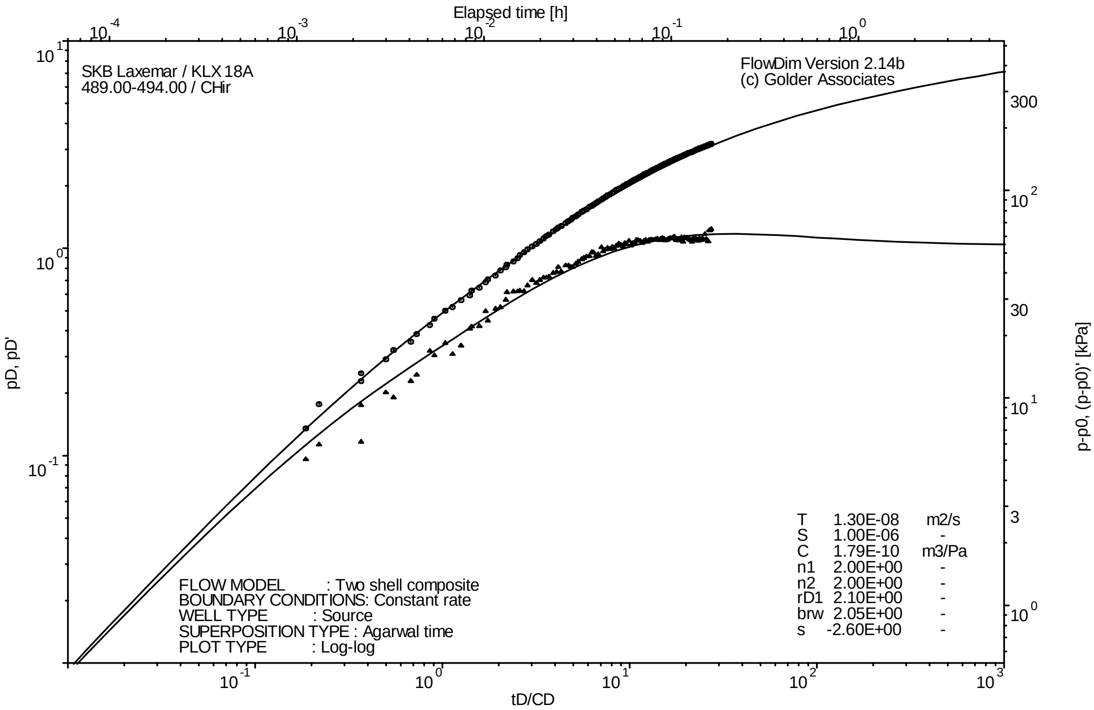
Pressure and flow rate vs. time; cartesian plot



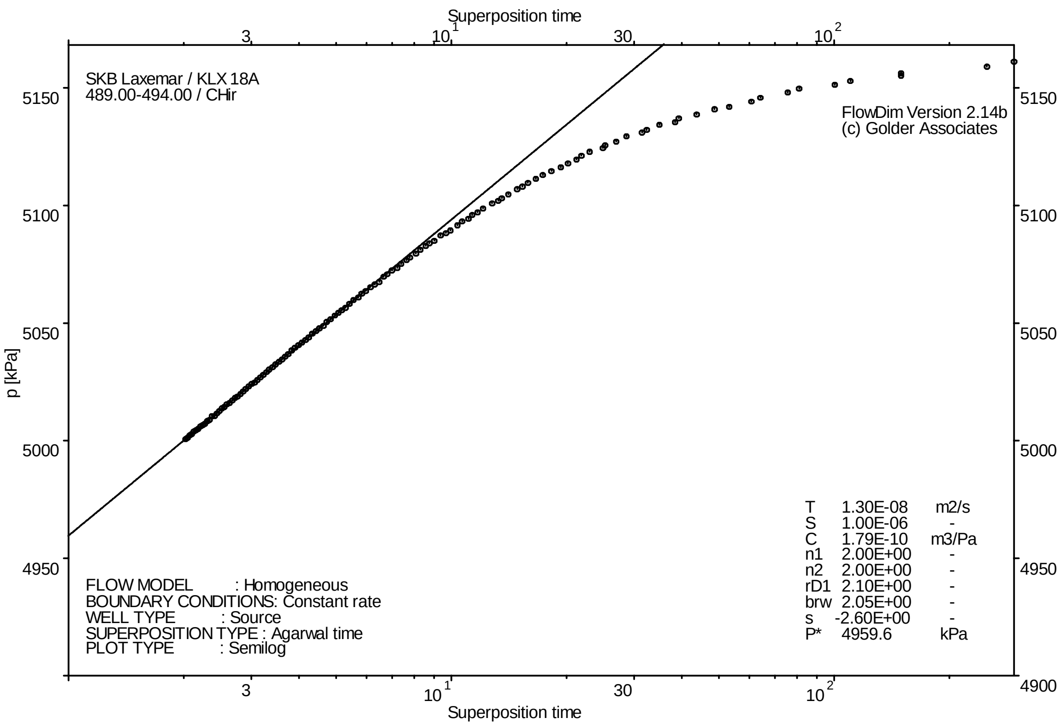
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

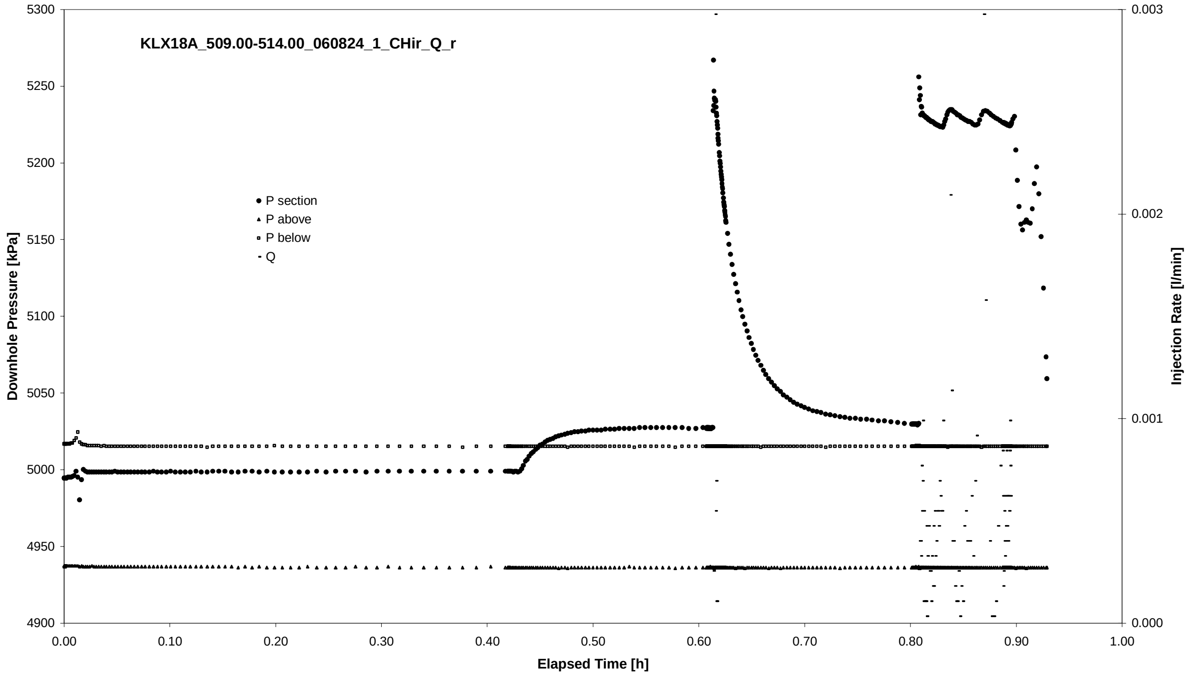


CHIR phase; HORNER match

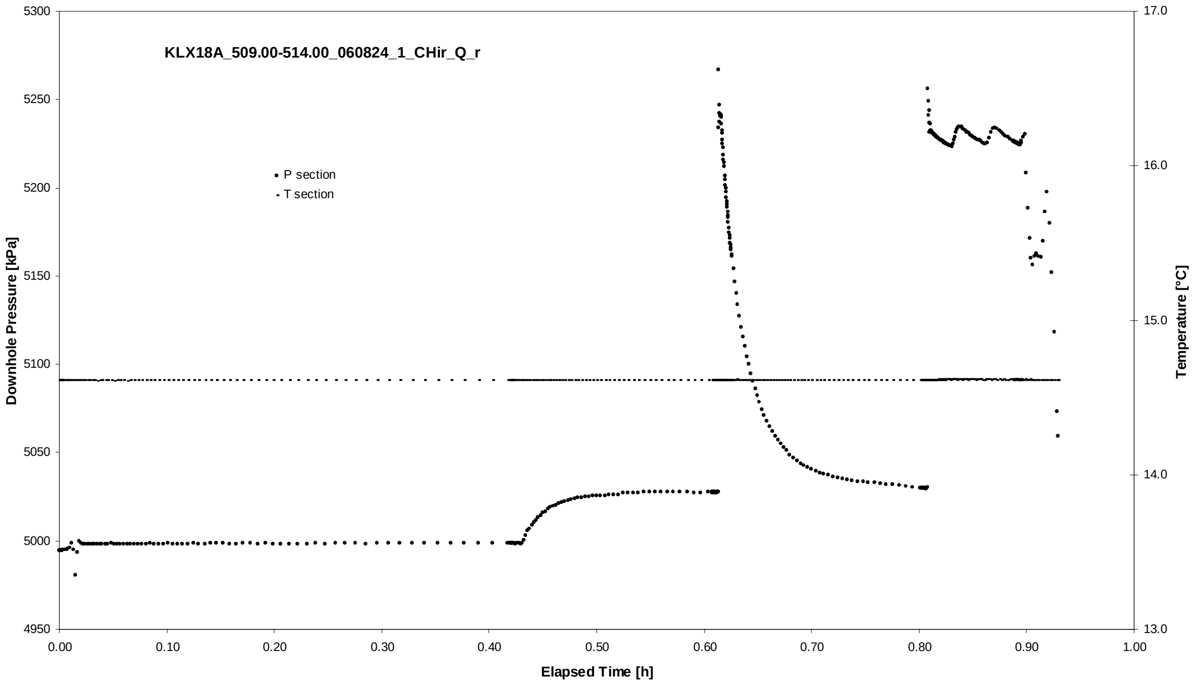
APPENDIX 2-74

Test 509.00 – 514.00 m

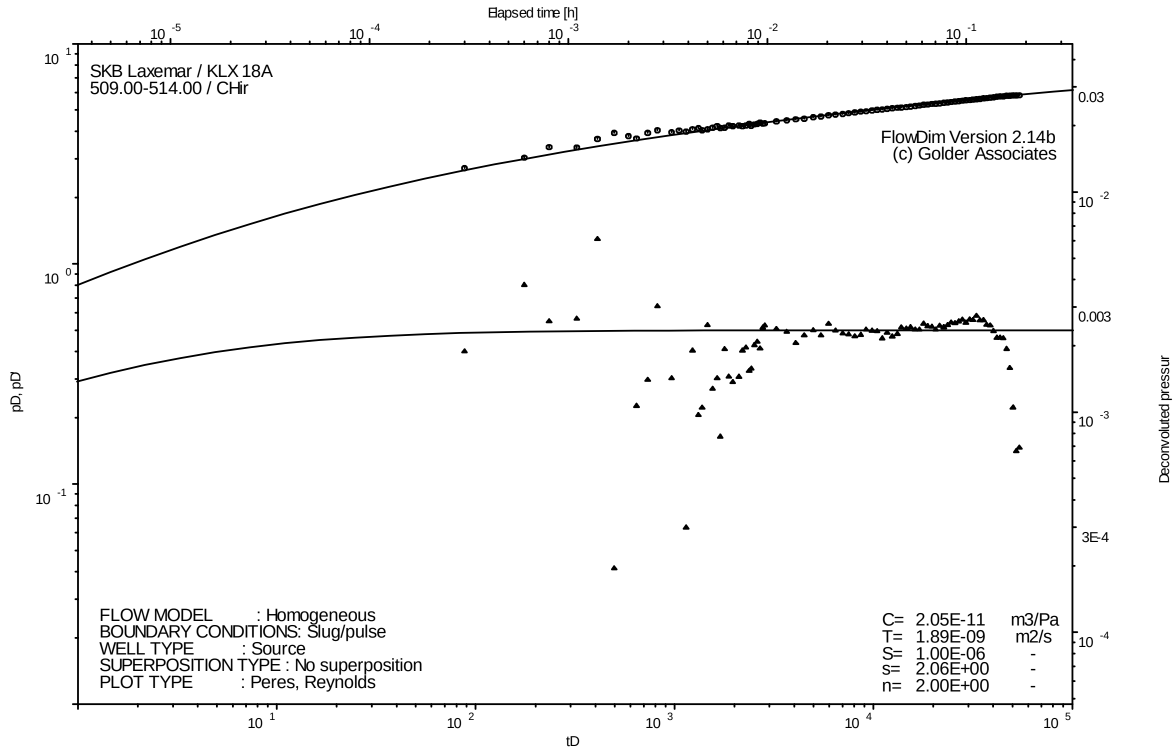
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

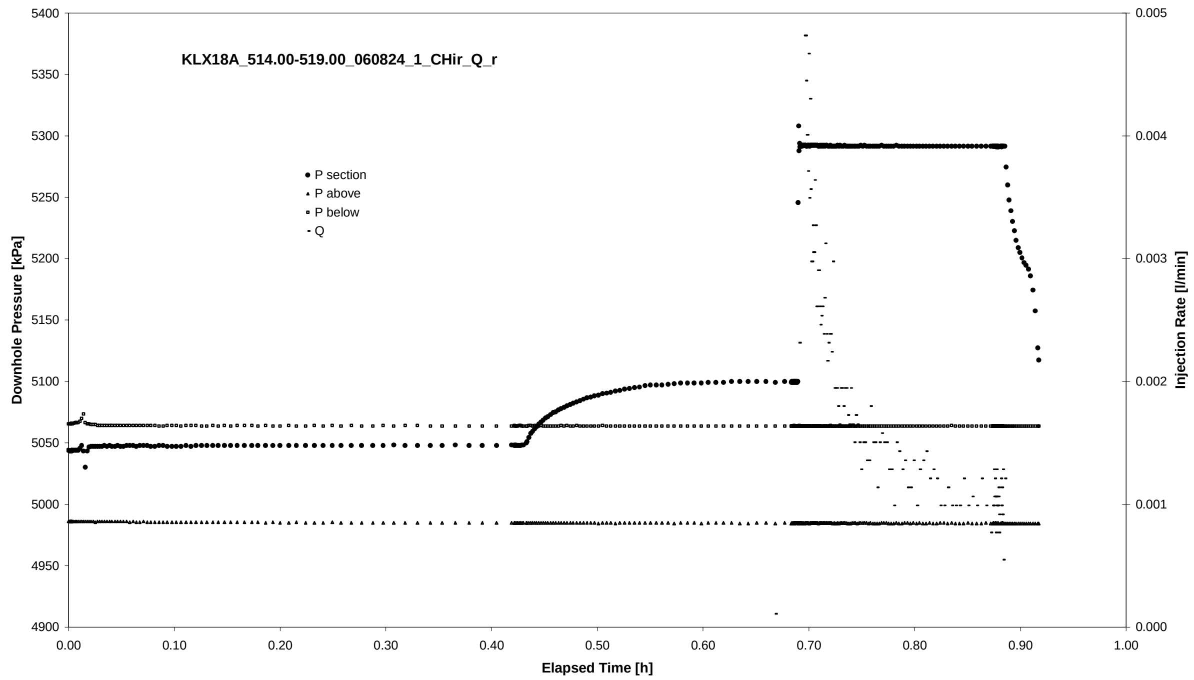


Pulse injection; deconvolution match

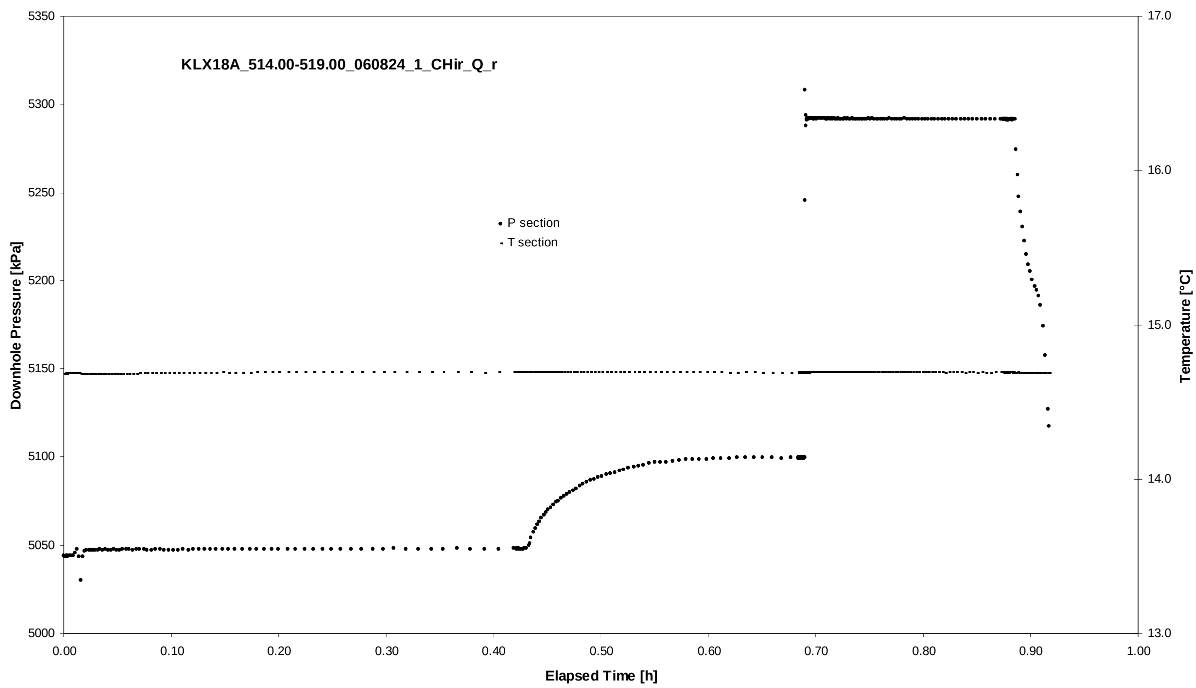
APPENDIX 2-75

Test 514.00 – 519.00 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

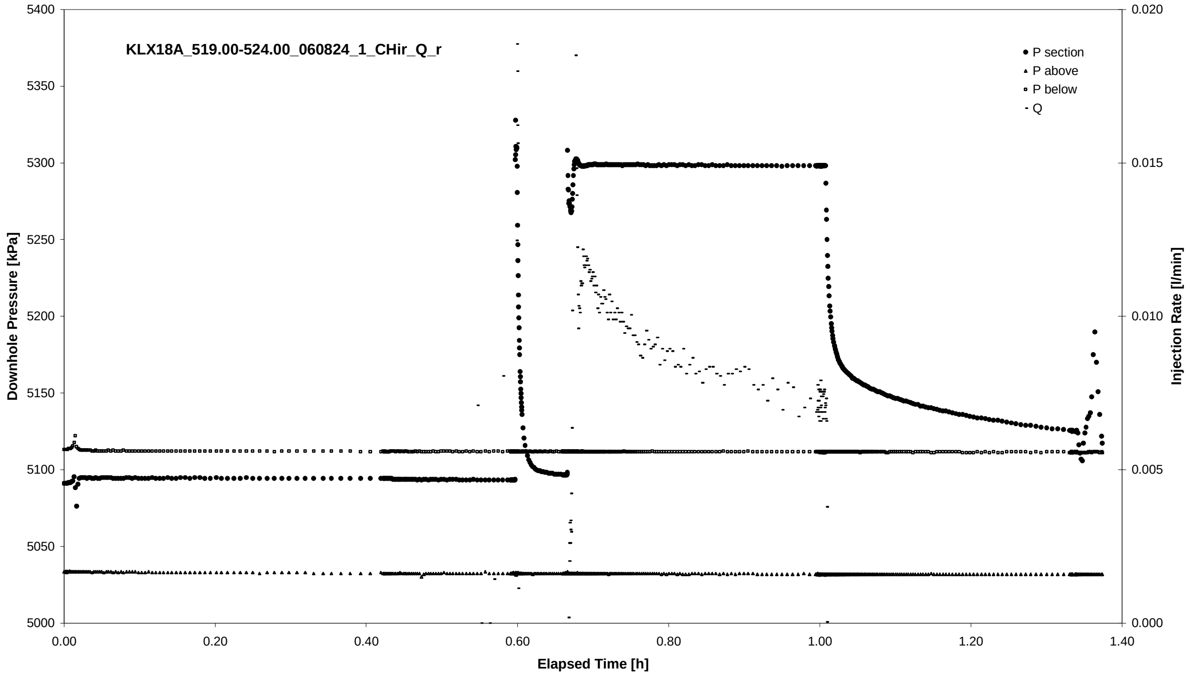
Not Analysed

CHIR phase; HORNER match

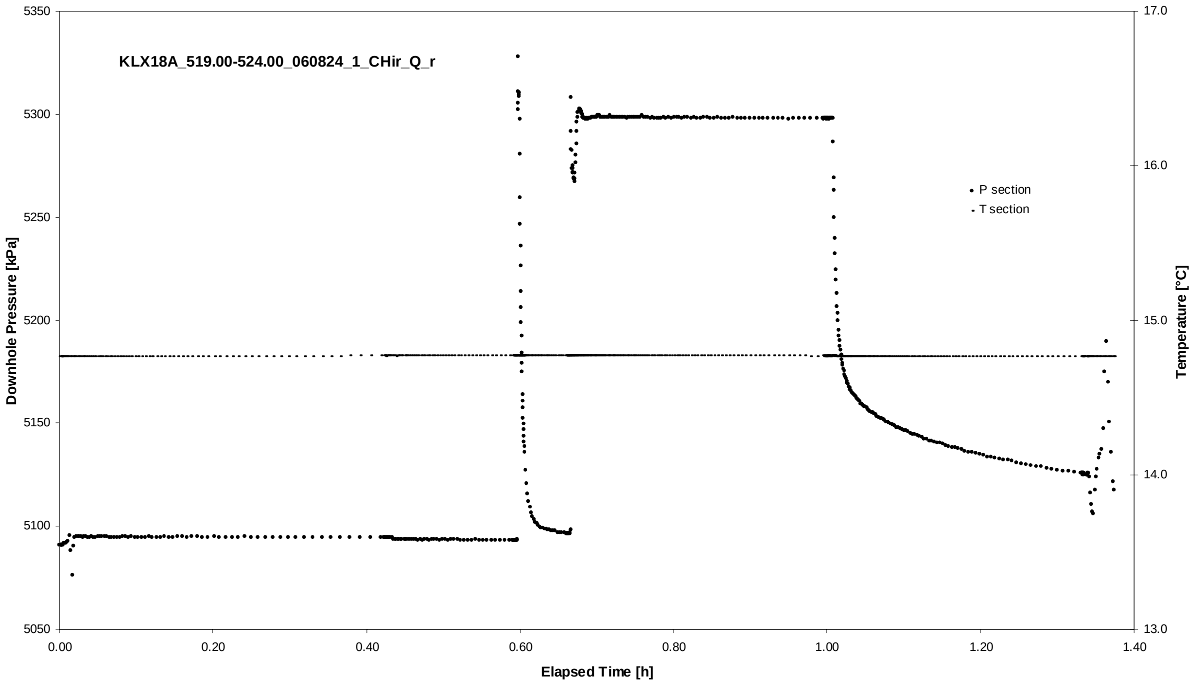
APPENDIX 2-76

Test 519.00 – 524.00 m

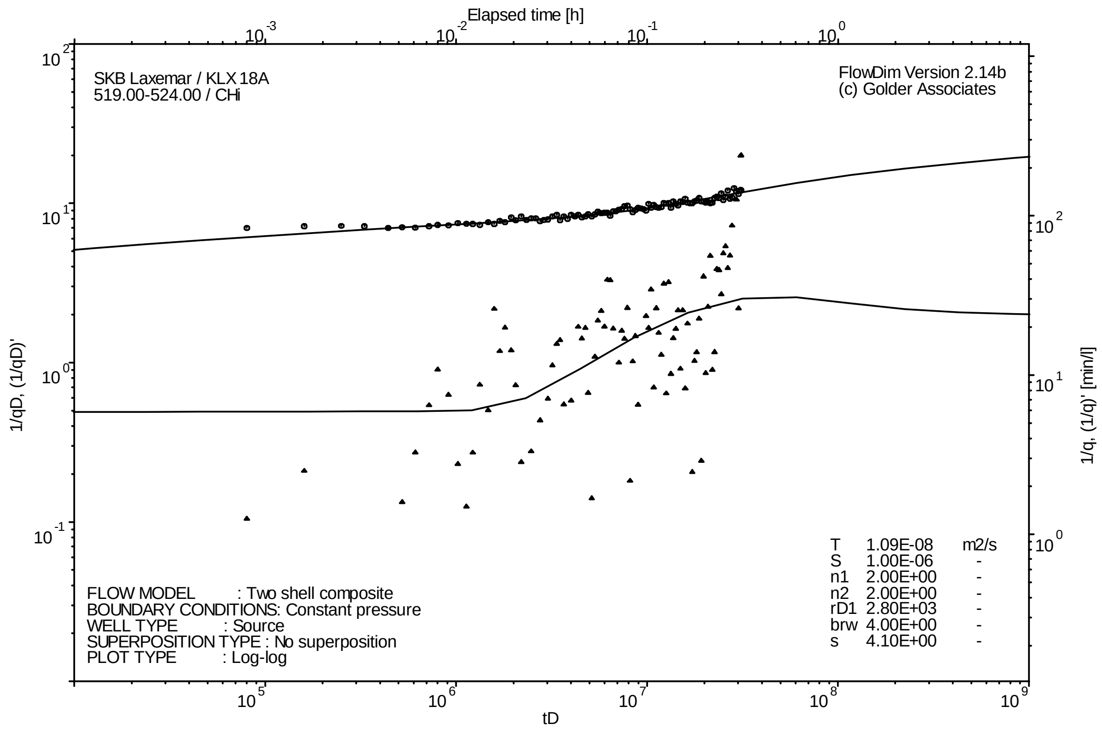
Analysis diagrams



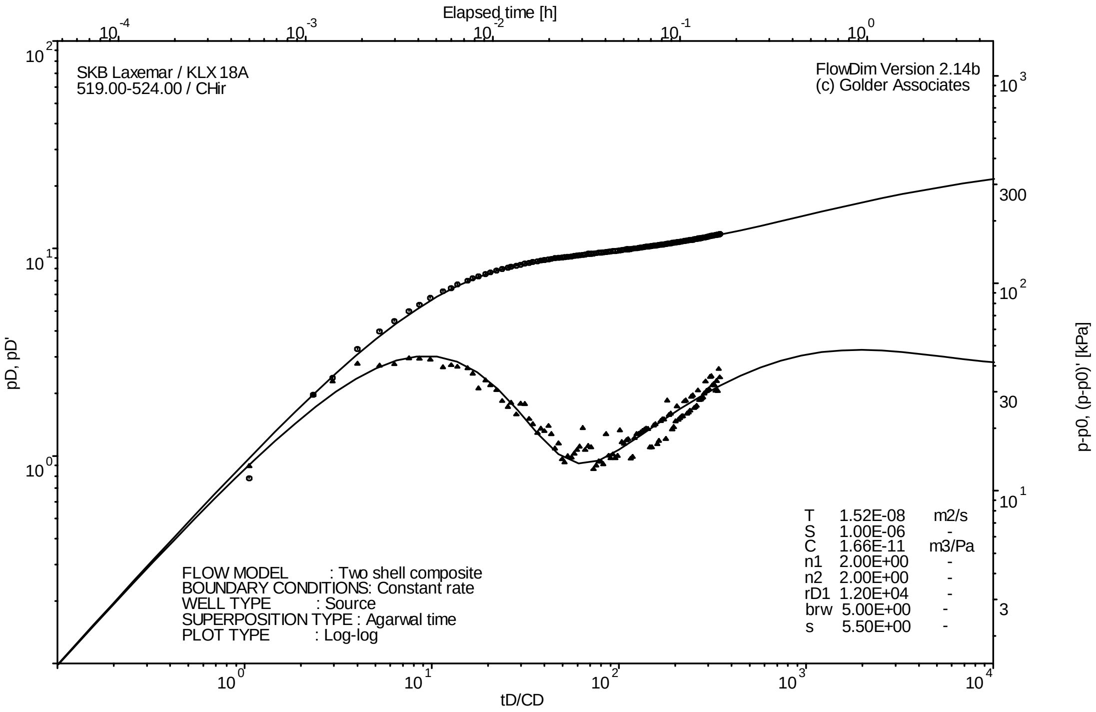
Pressure and flow rate vs. time; cartesian plot



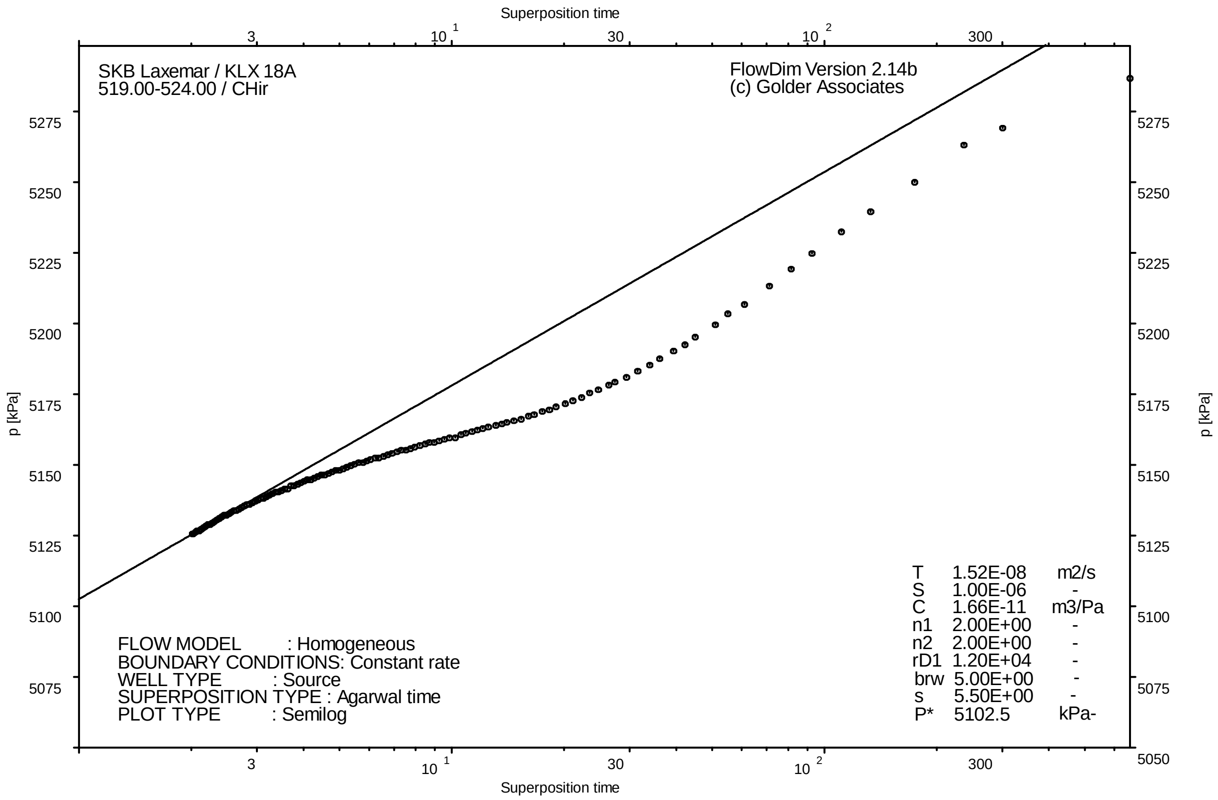
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

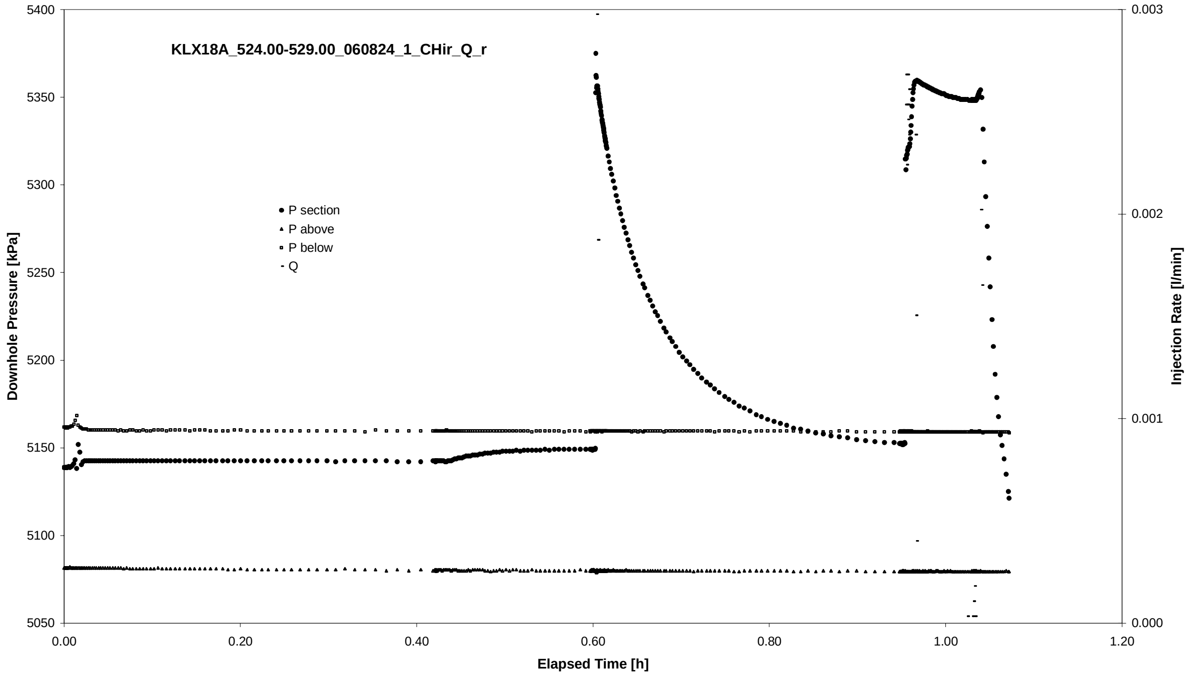


CHIR phase; HORNER match

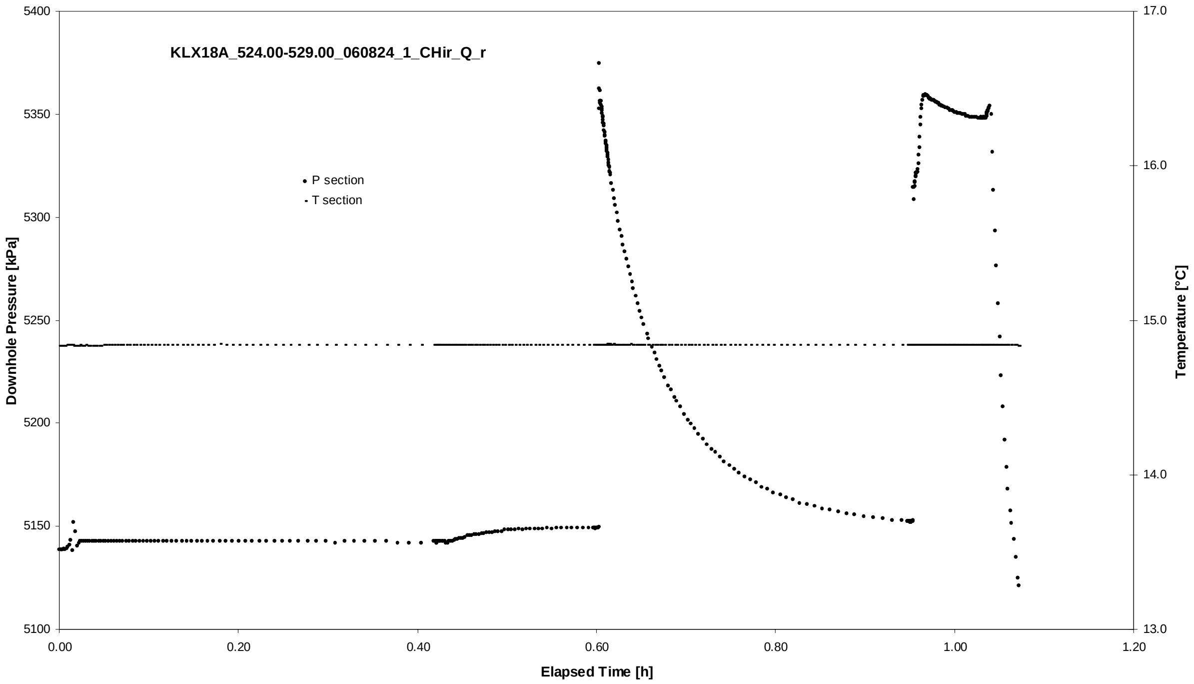
APPENDIX 2-77

Test 524.00 – 529.00 m

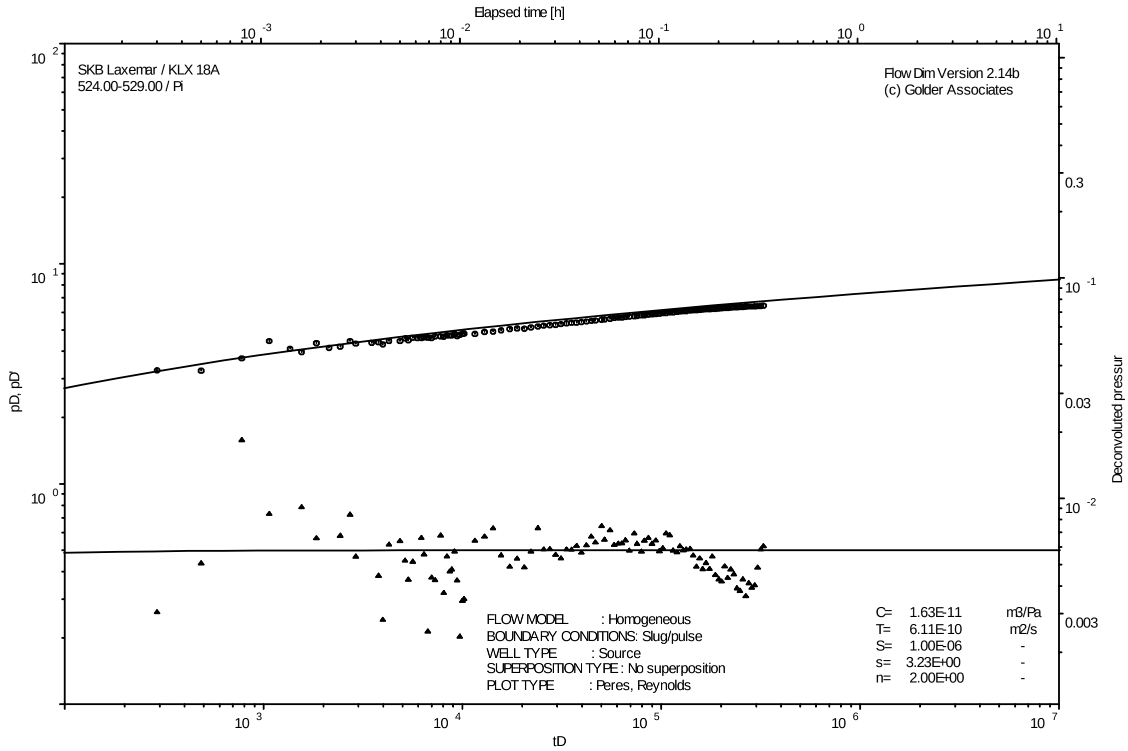
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

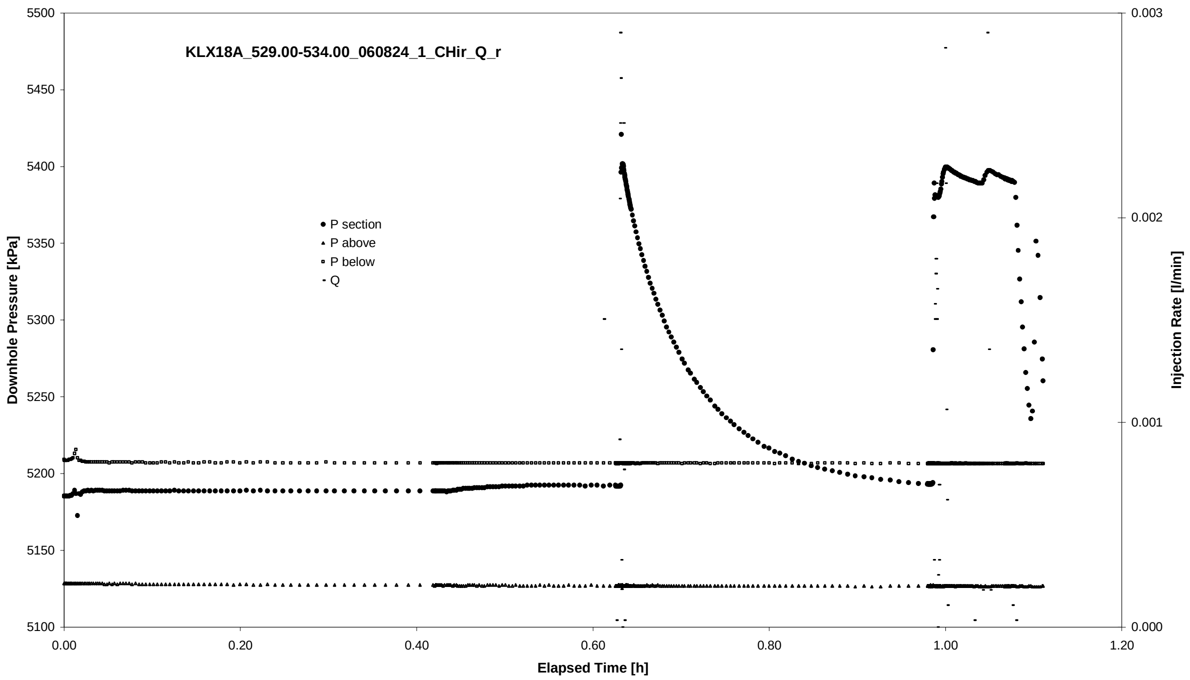


Pulse Injection; deconvolution match

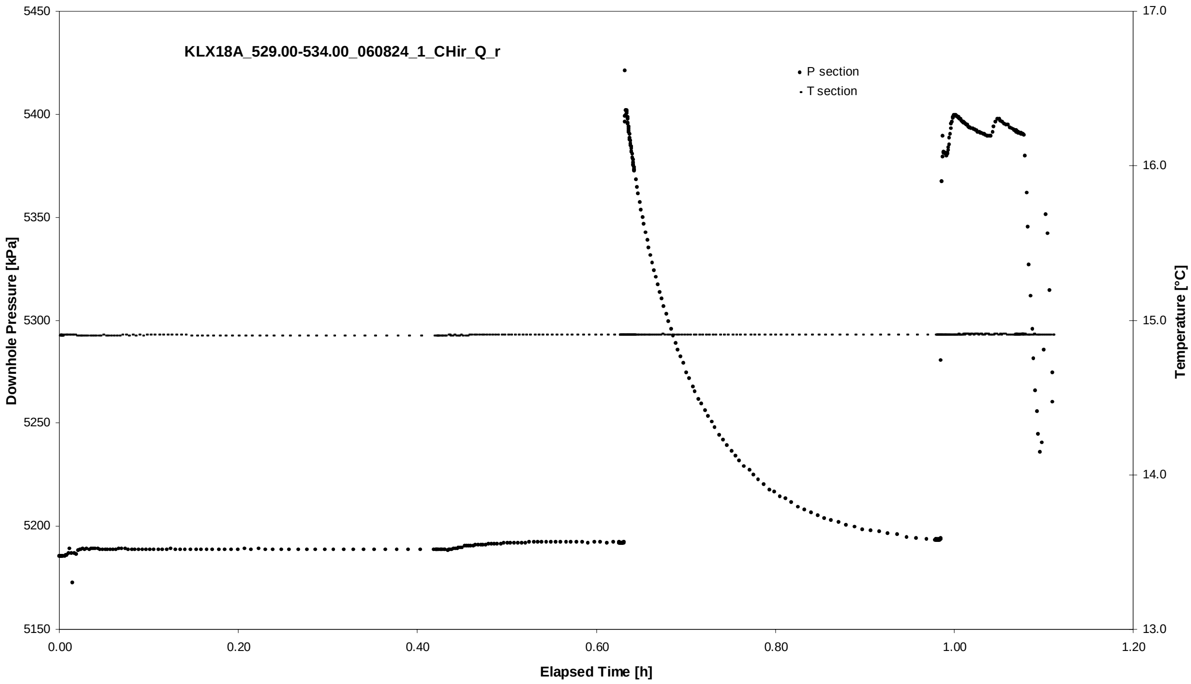
APPENDIX 2-78

Test 529.00 – 534.00 m

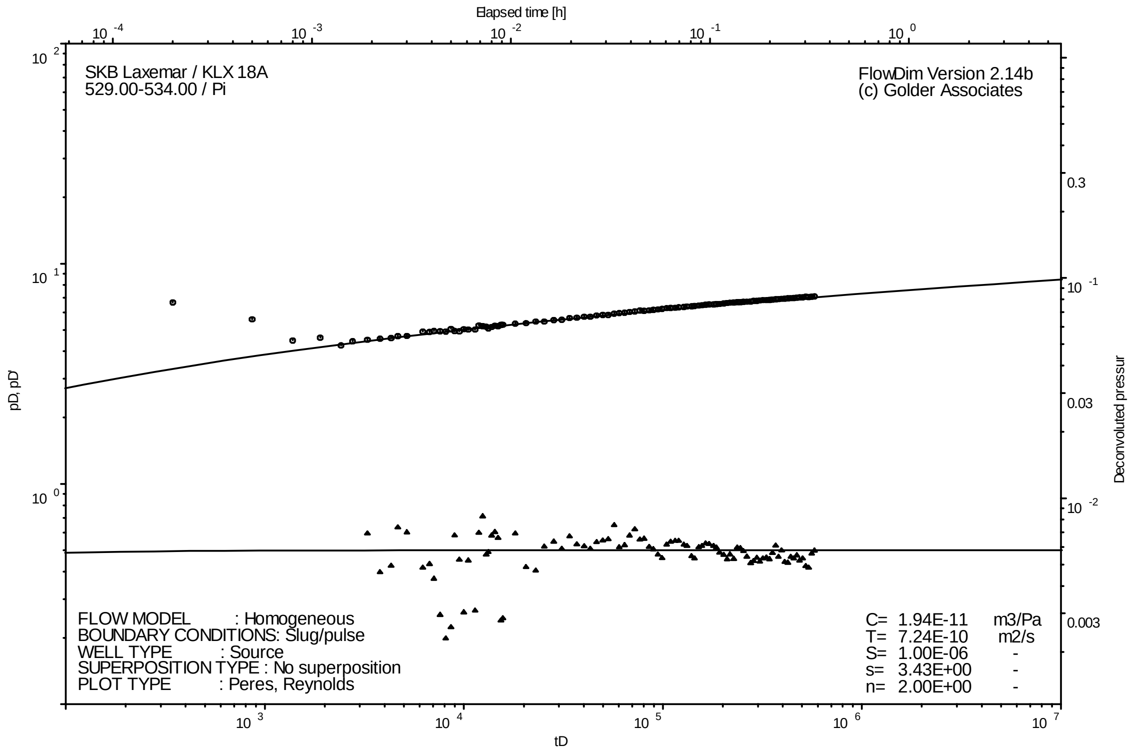
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

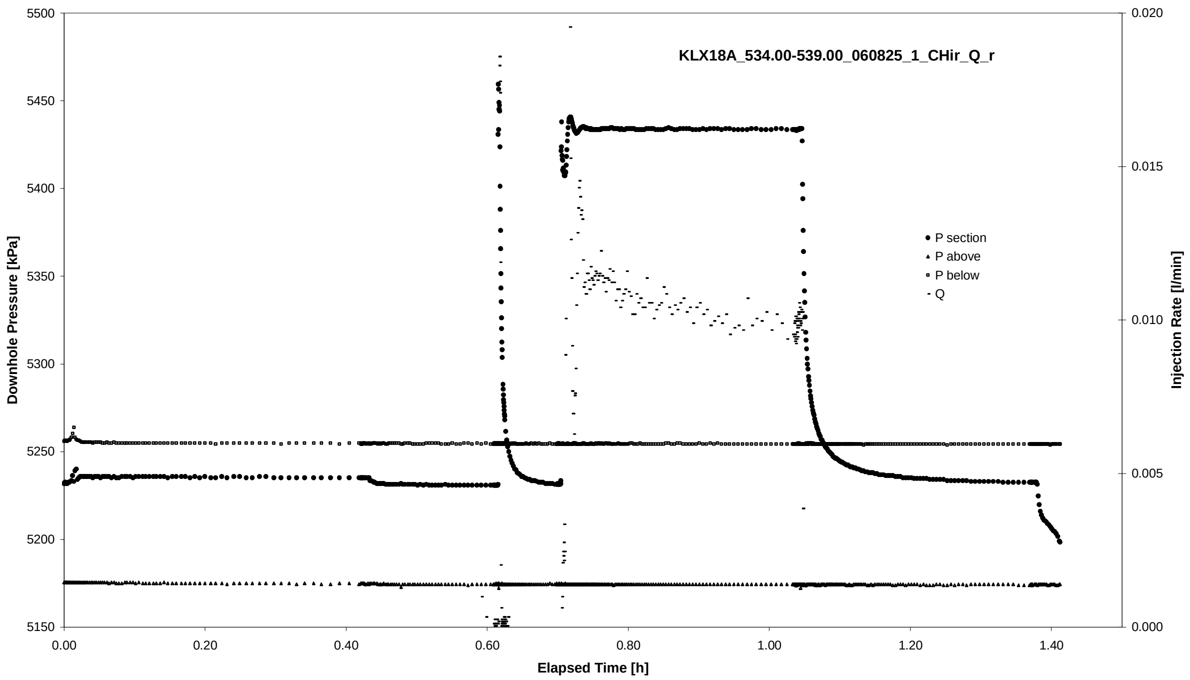


Pulse Injection; deconvolution match

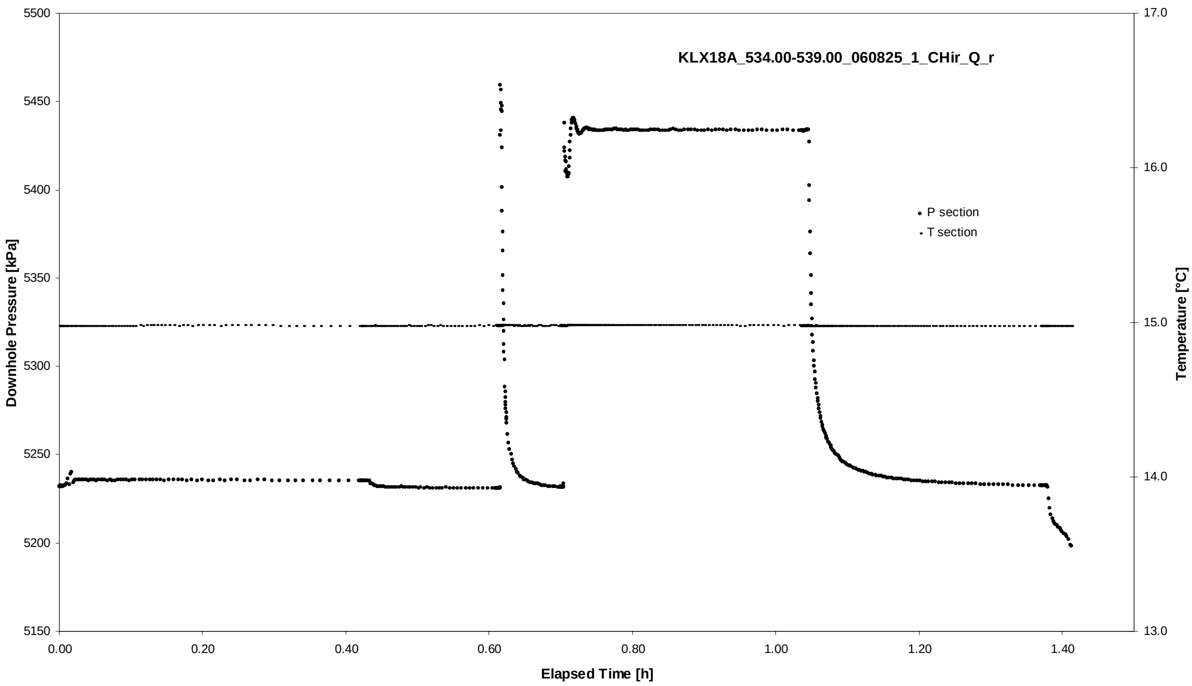
APPENDIX 2-79

Test 534.00 – 539.00 m

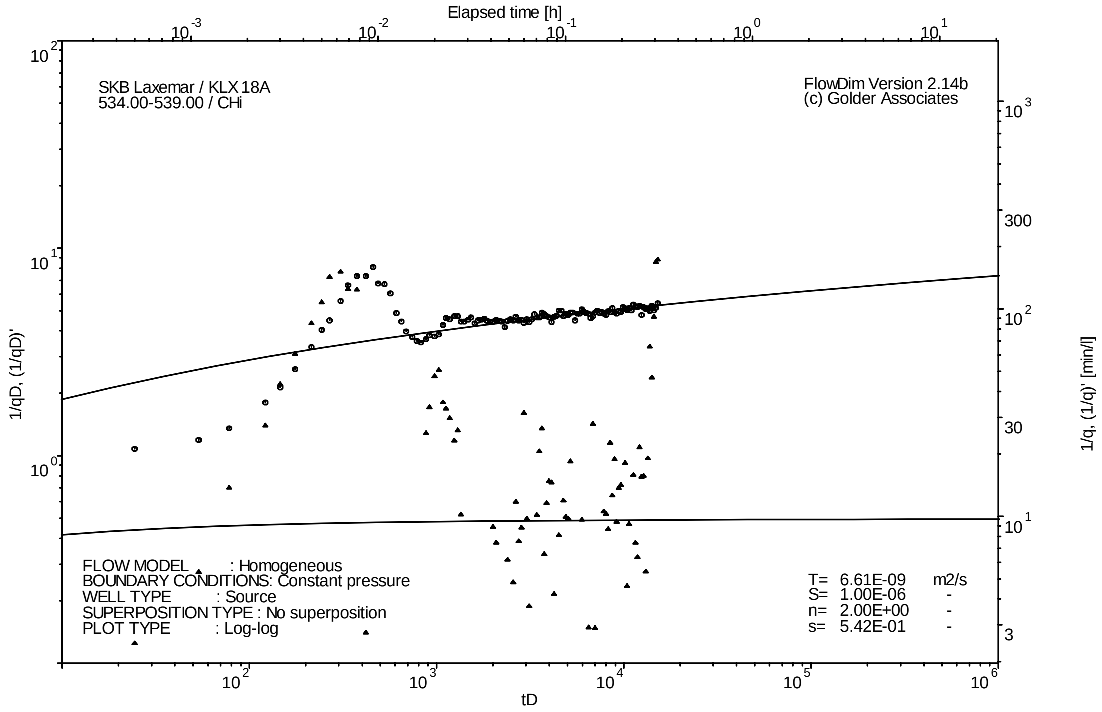
Analysis diagrams



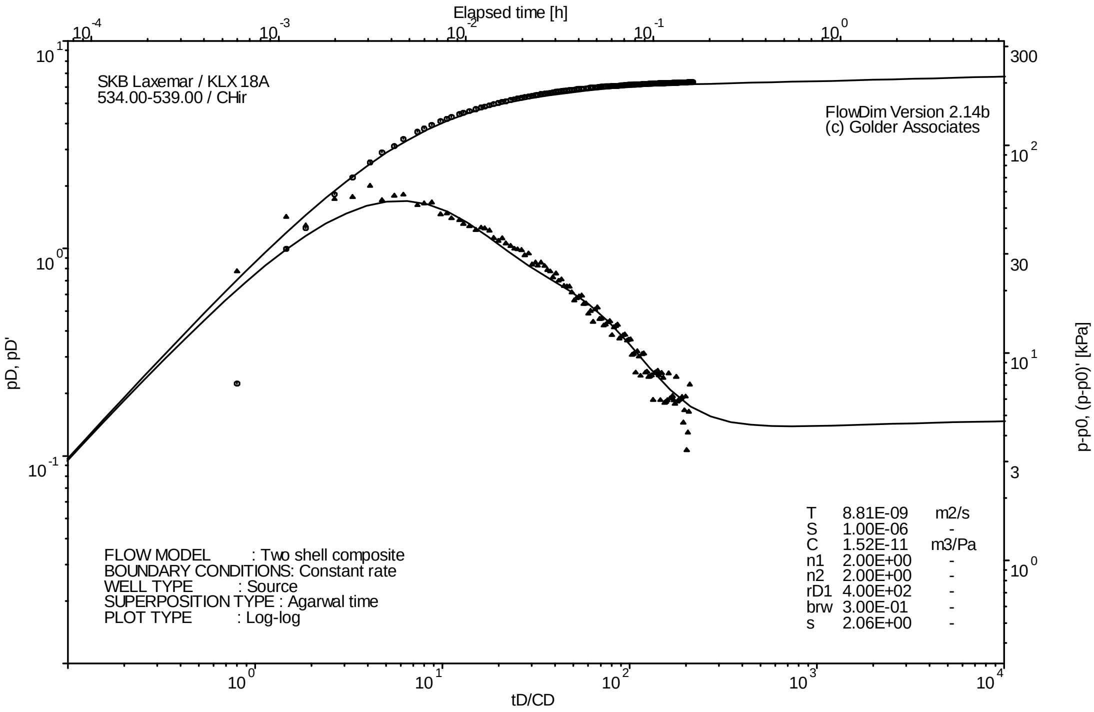
Pressure and flow rate vs. time; cartesian plot



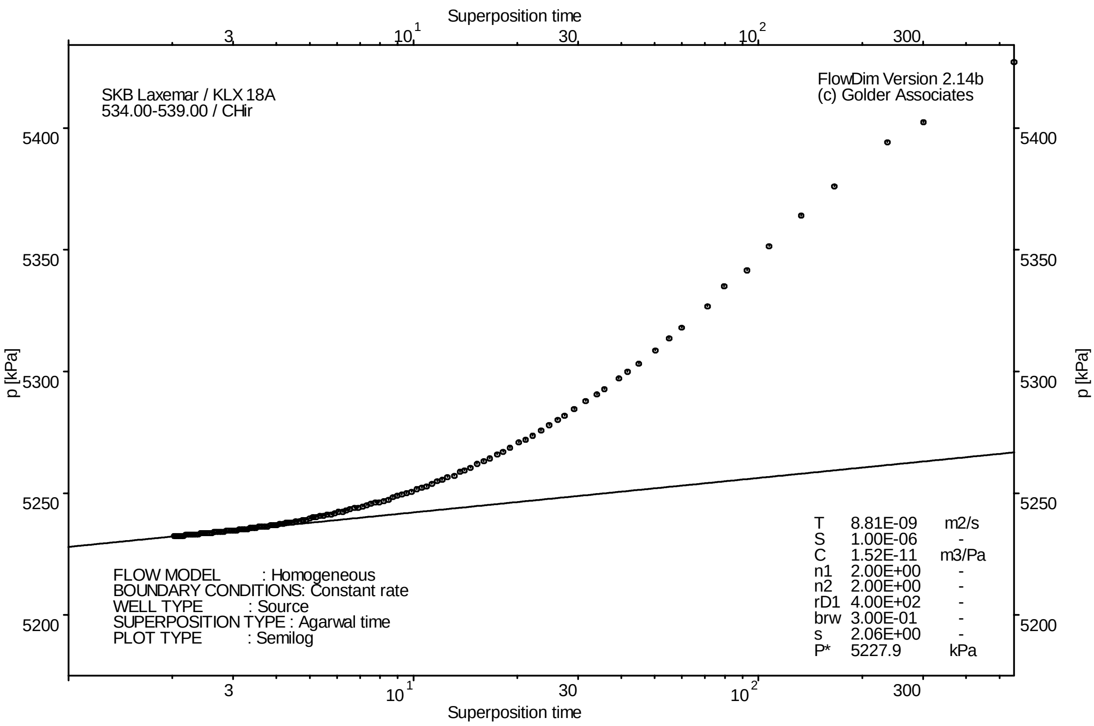
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

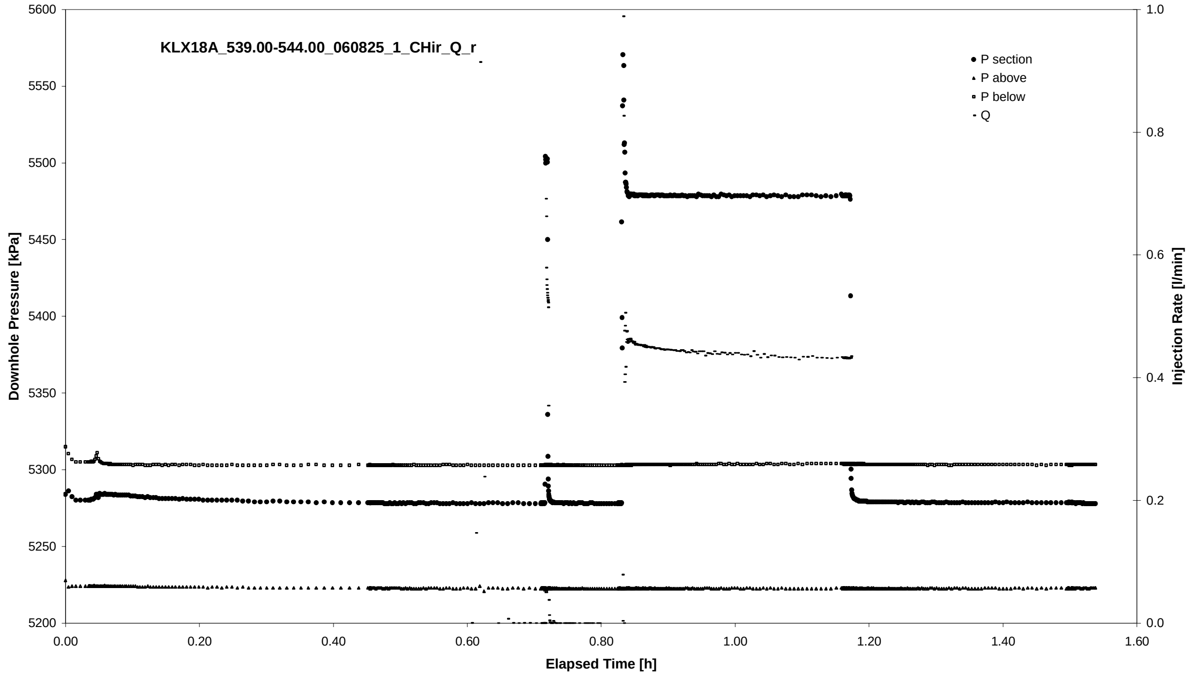


CHIR phase; HORNER match

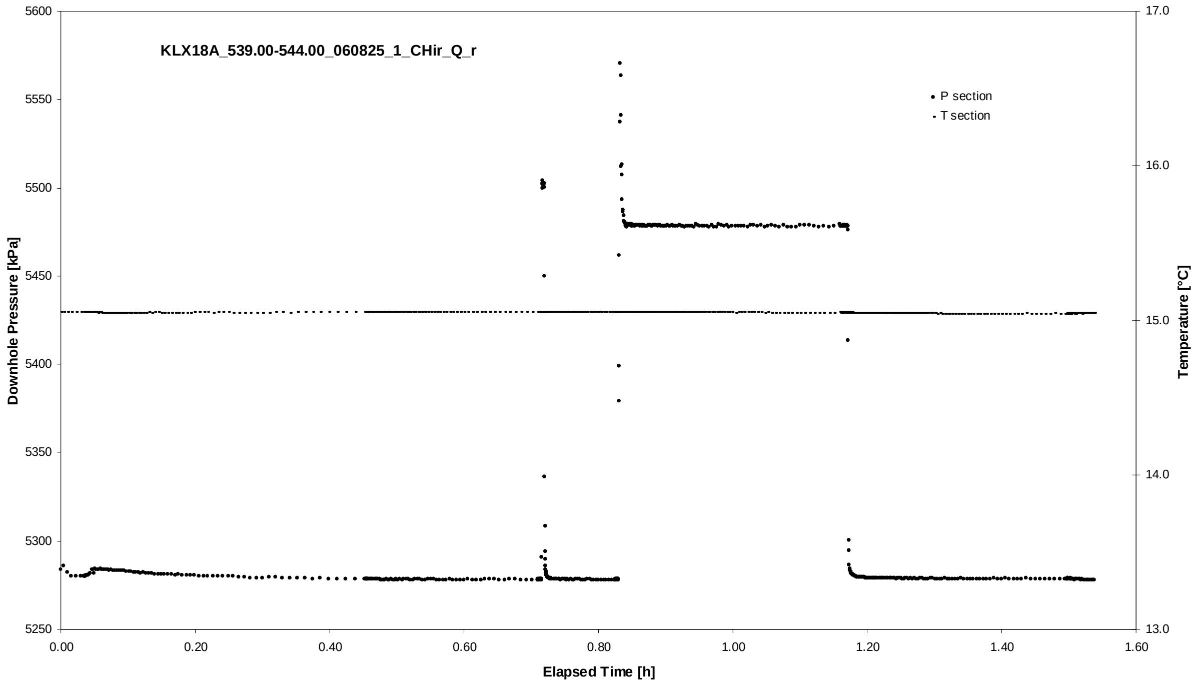
APPENDIX 2-80

Test 539.00 – 544.00 m

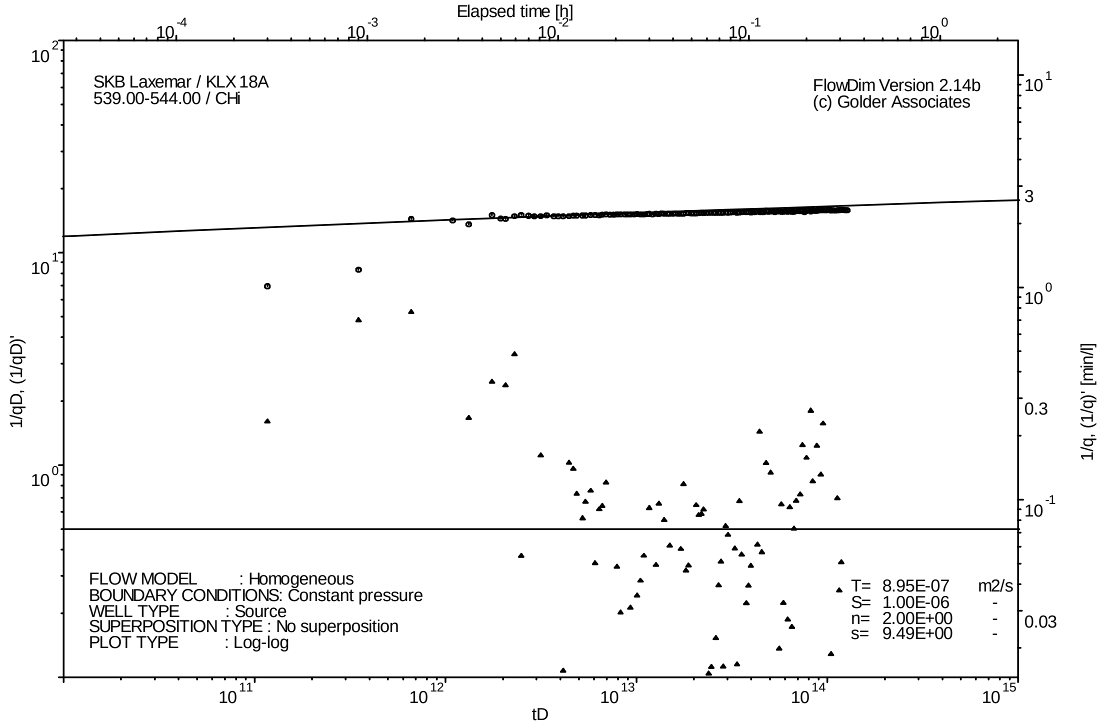
Analysis diagrams



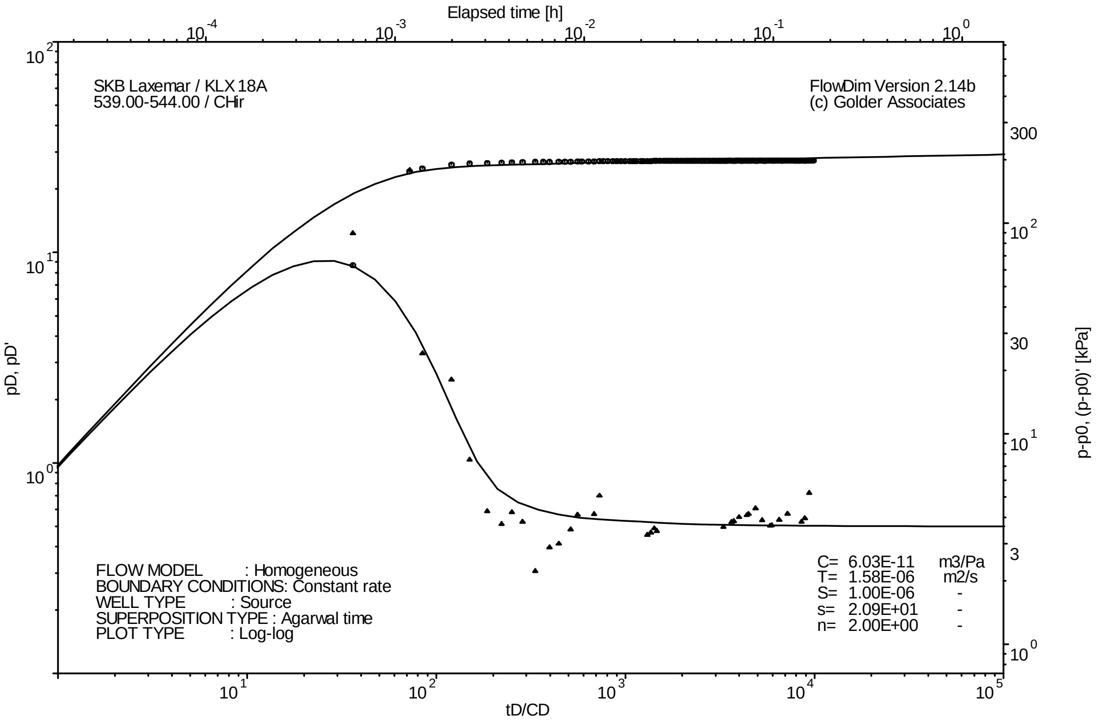
Pressure and flow rate vs. time; cartesian plot



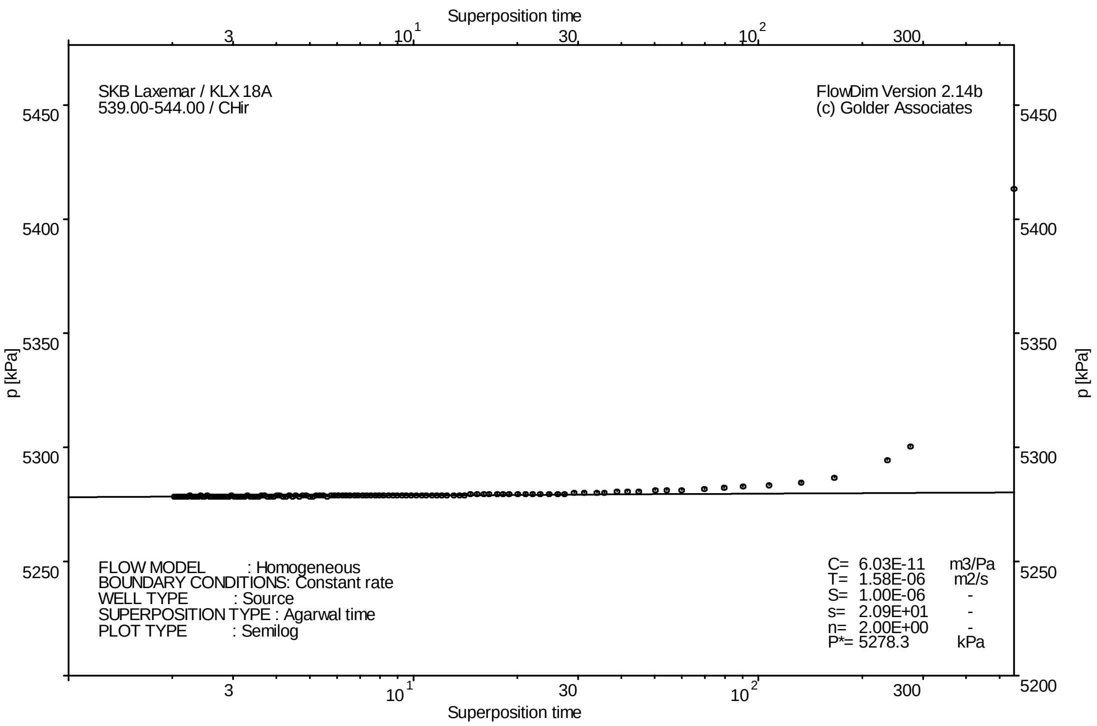
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

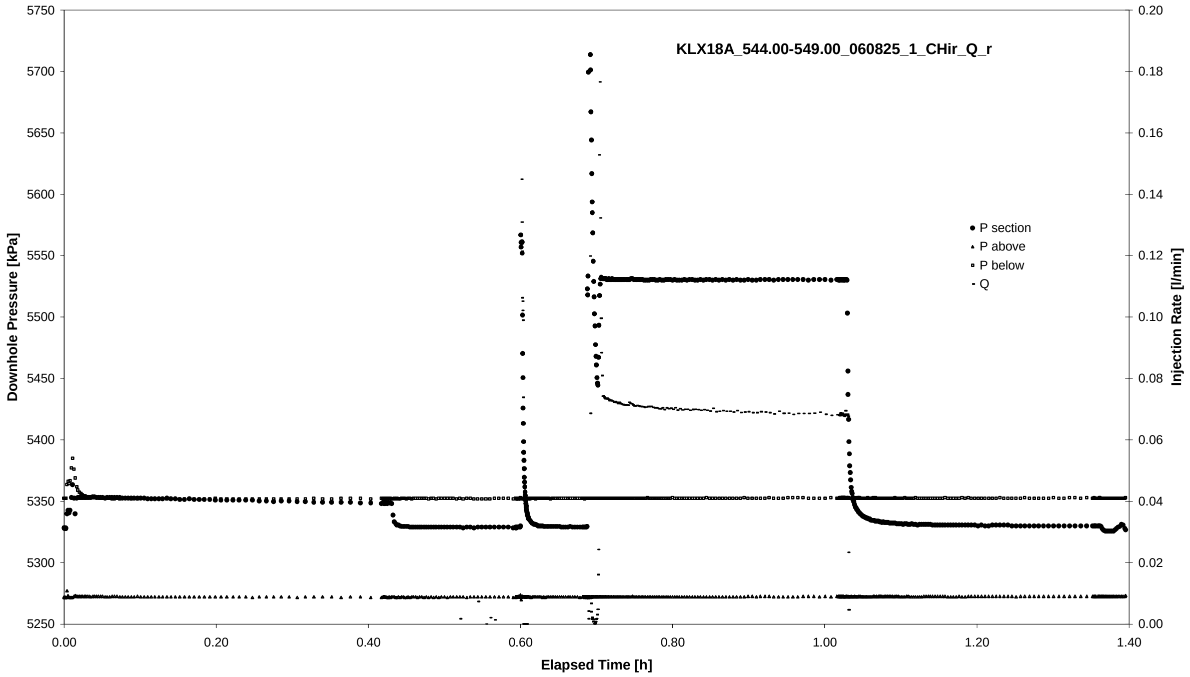


CHIR phase; HORNER match

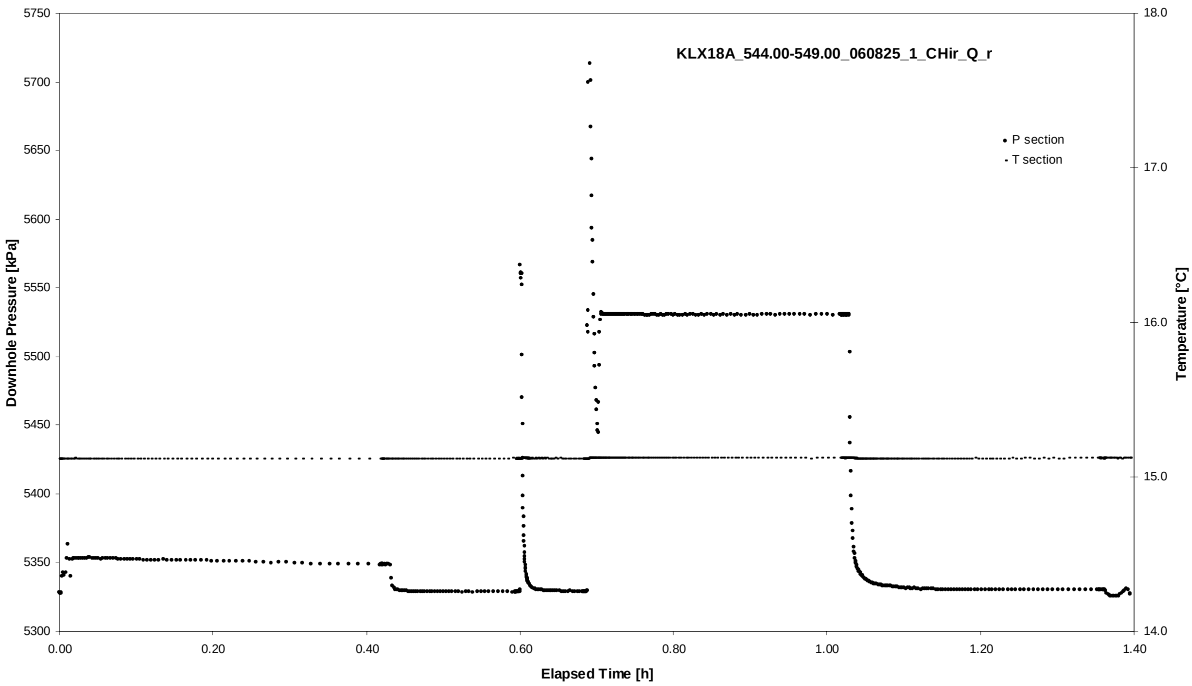
APPENDIX 2-81

Test 544.00 – 549.00 m

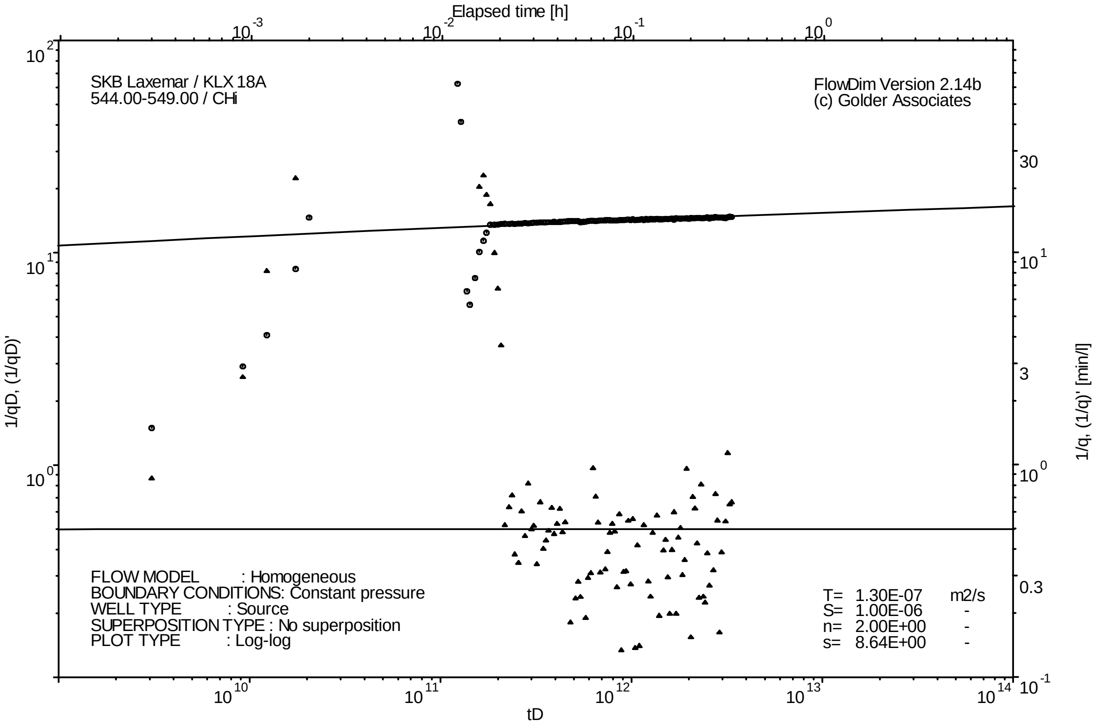
Analysis diagrams



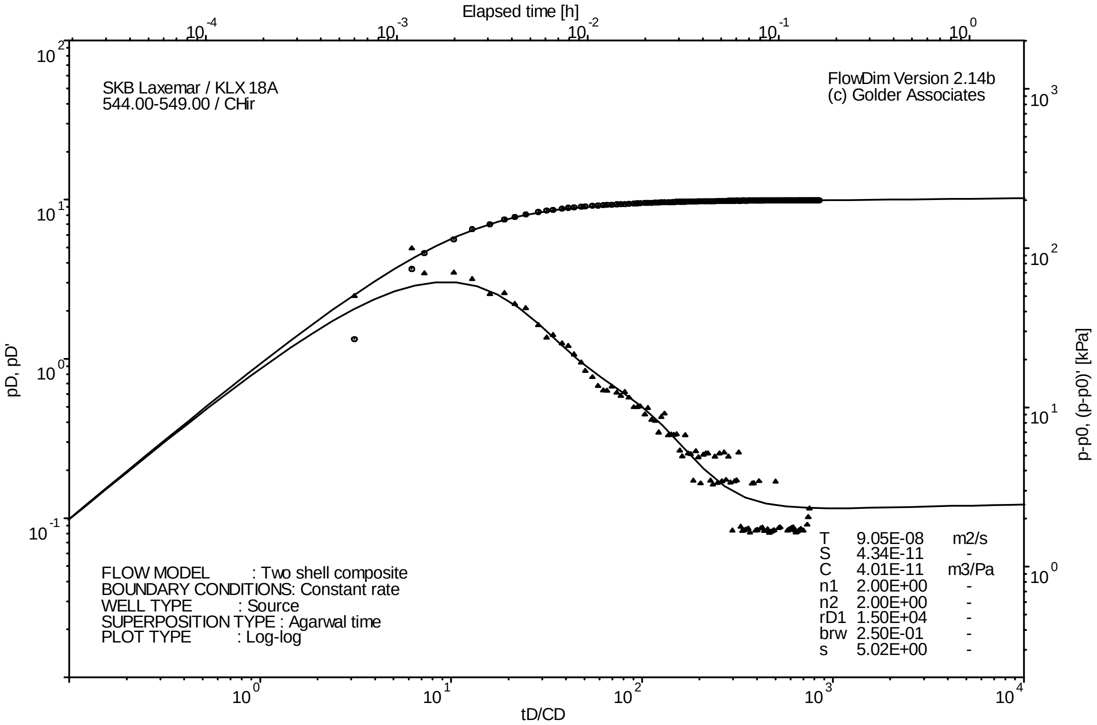
Pressure and flow rate vs. time; cartesian plot



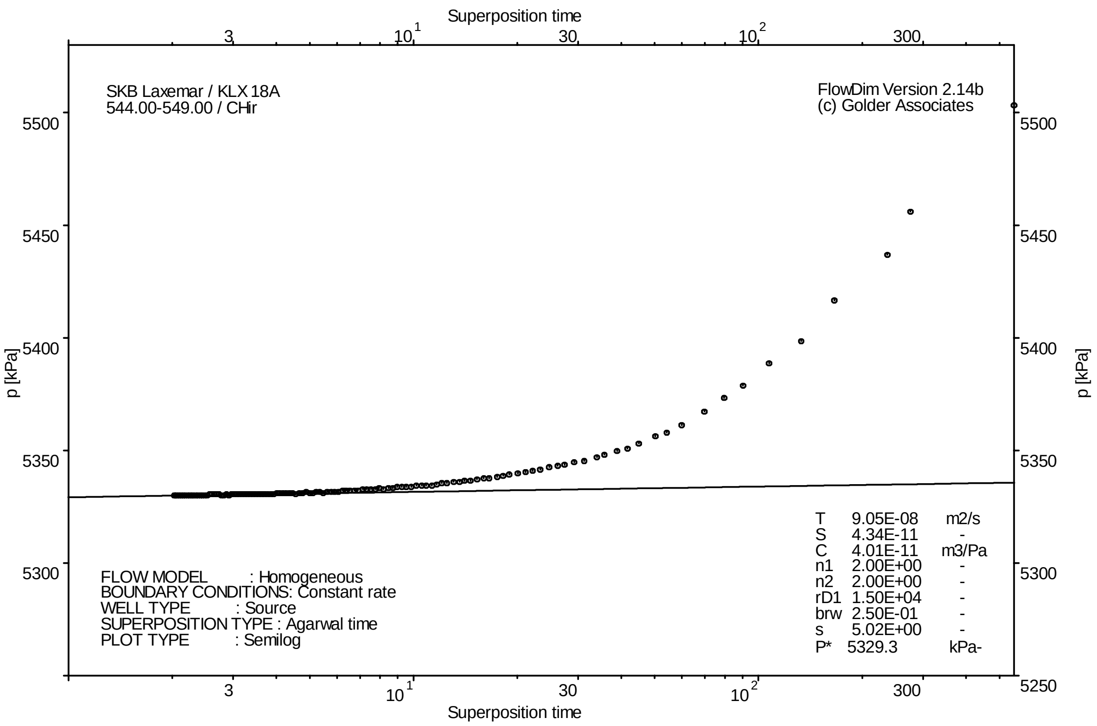
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

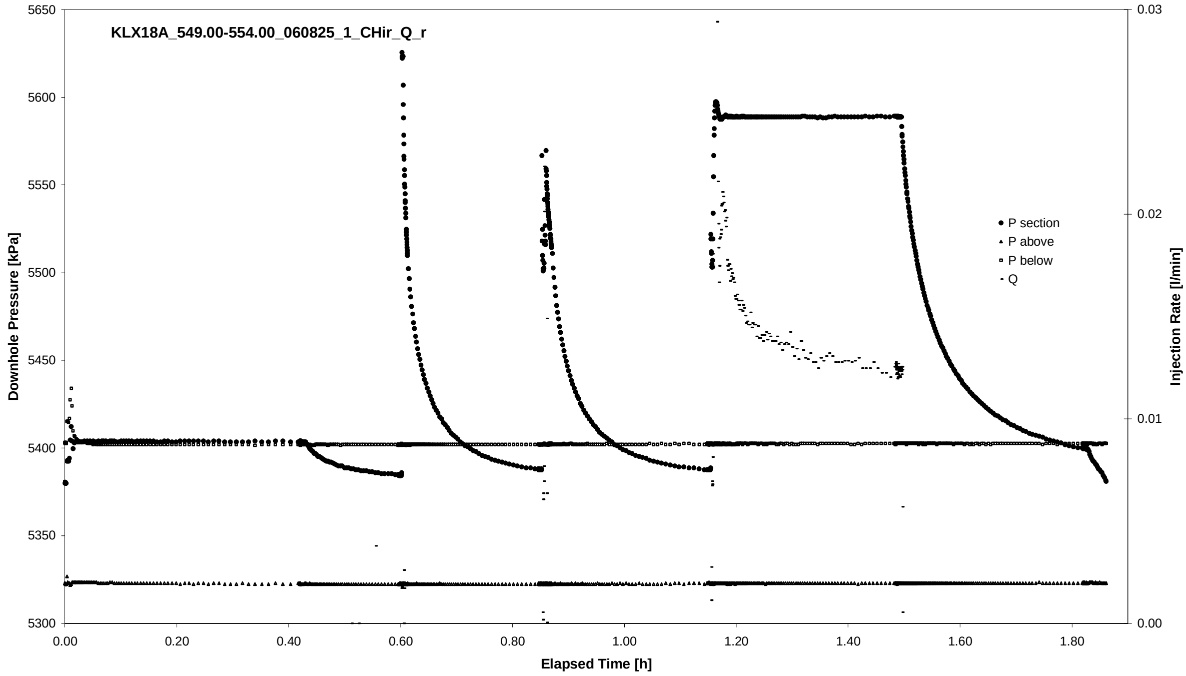


CHIR phase; HORNER match

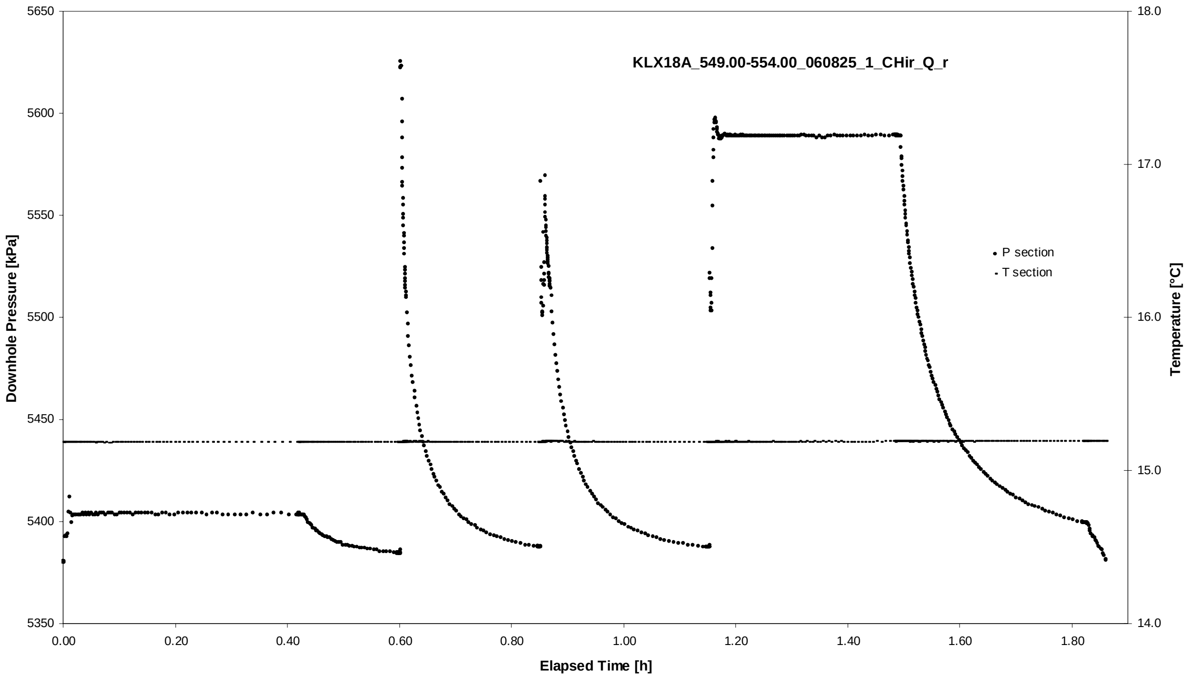
APPENDIX 2-82

Test 549.00 – 554.00 m

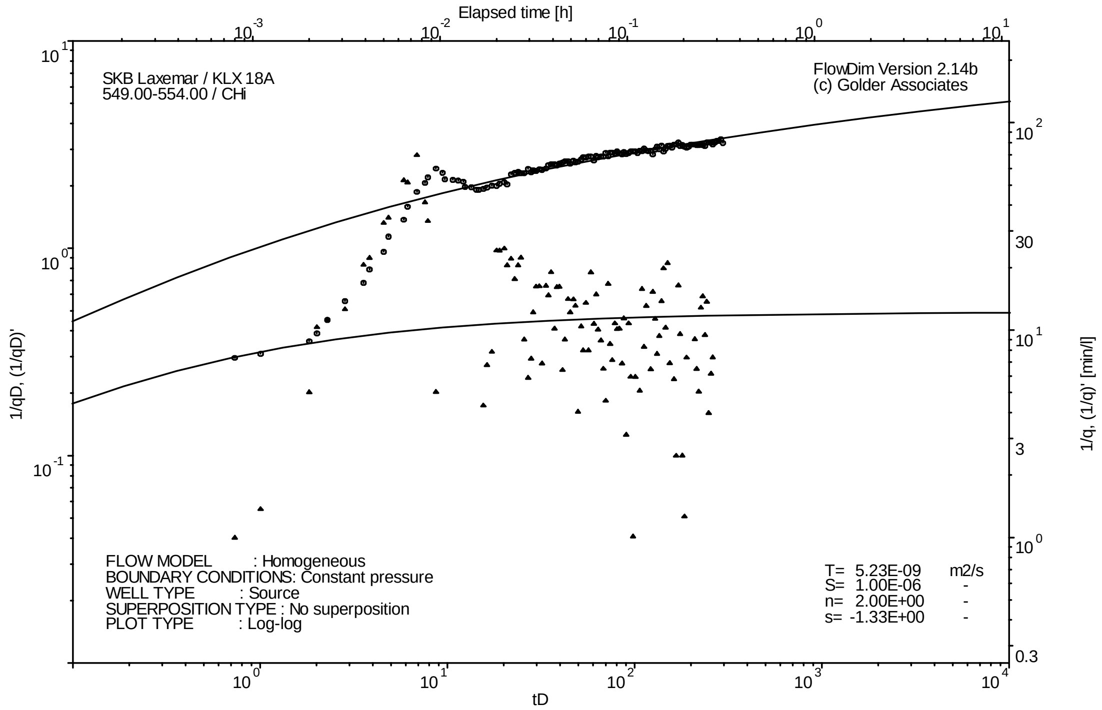
Analysis diagrams



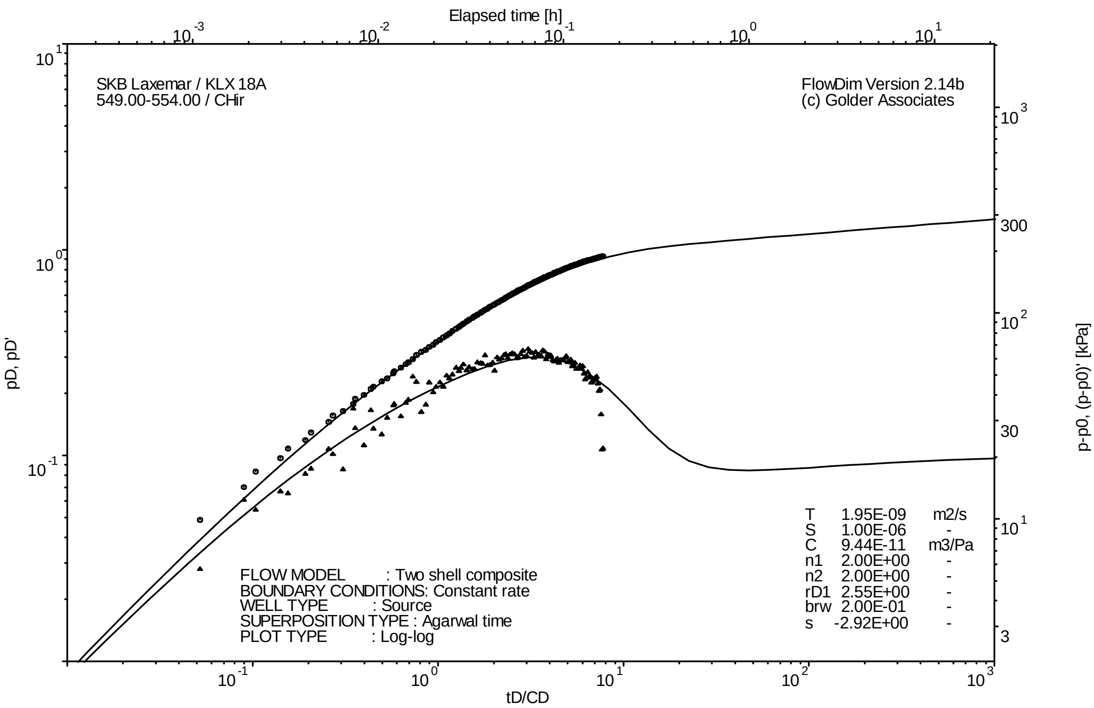
Pressure and flow rate vs. time; cartesian plot



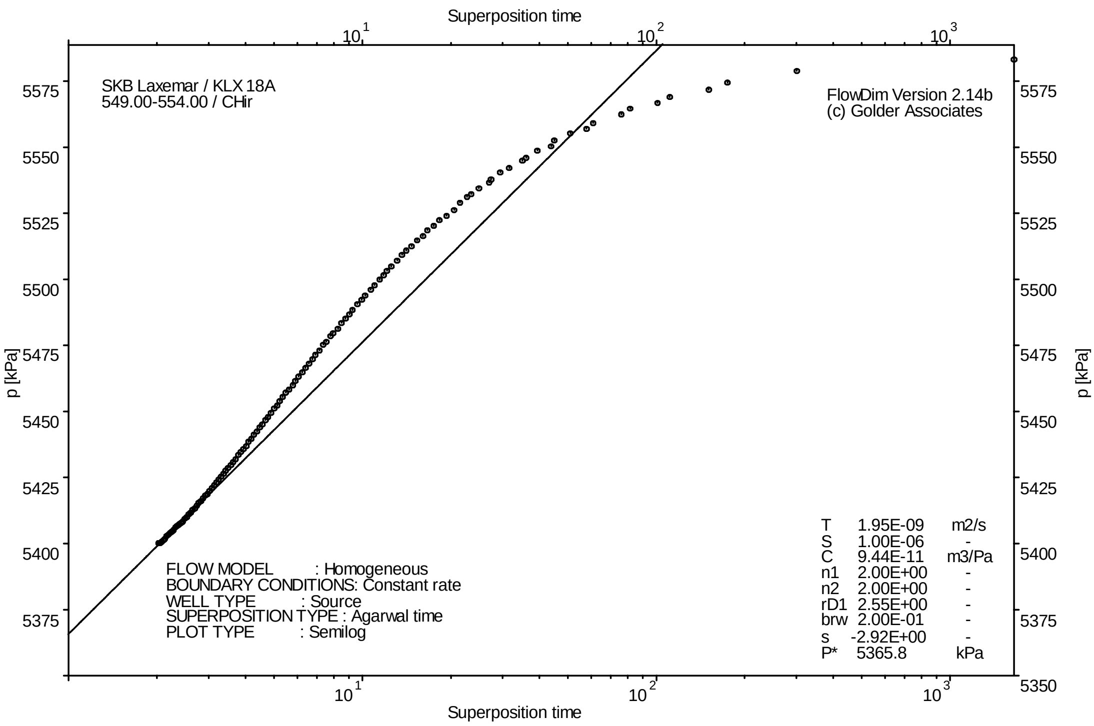
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

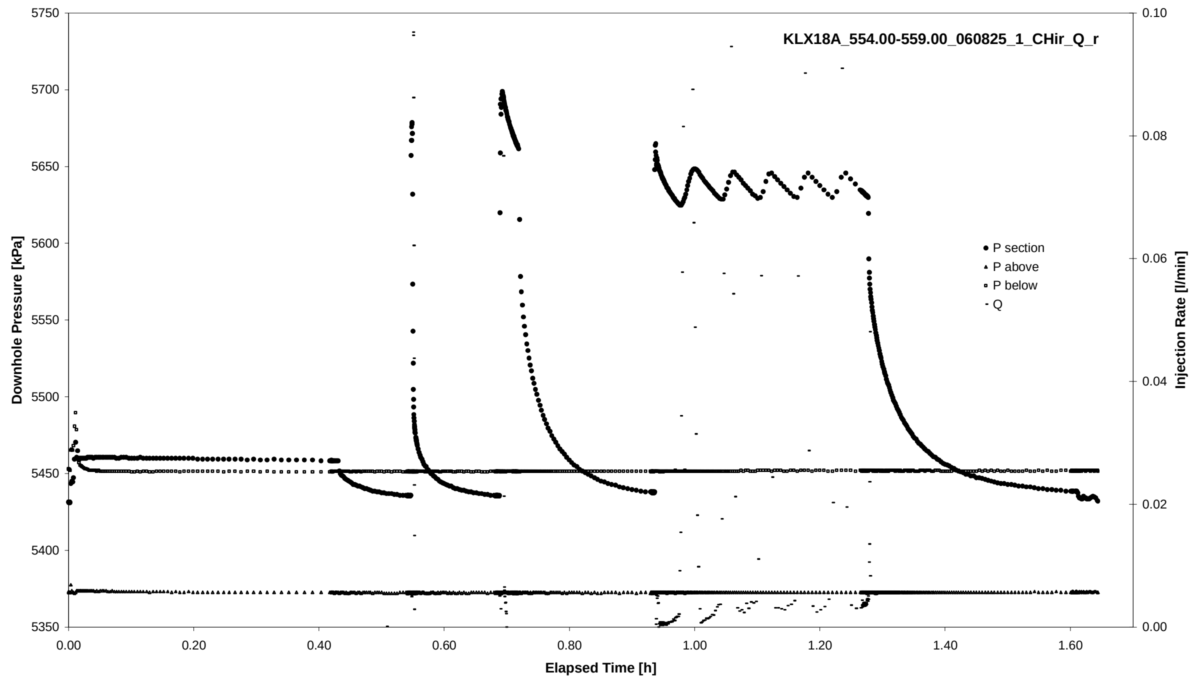


CHIR phase; HORNER match

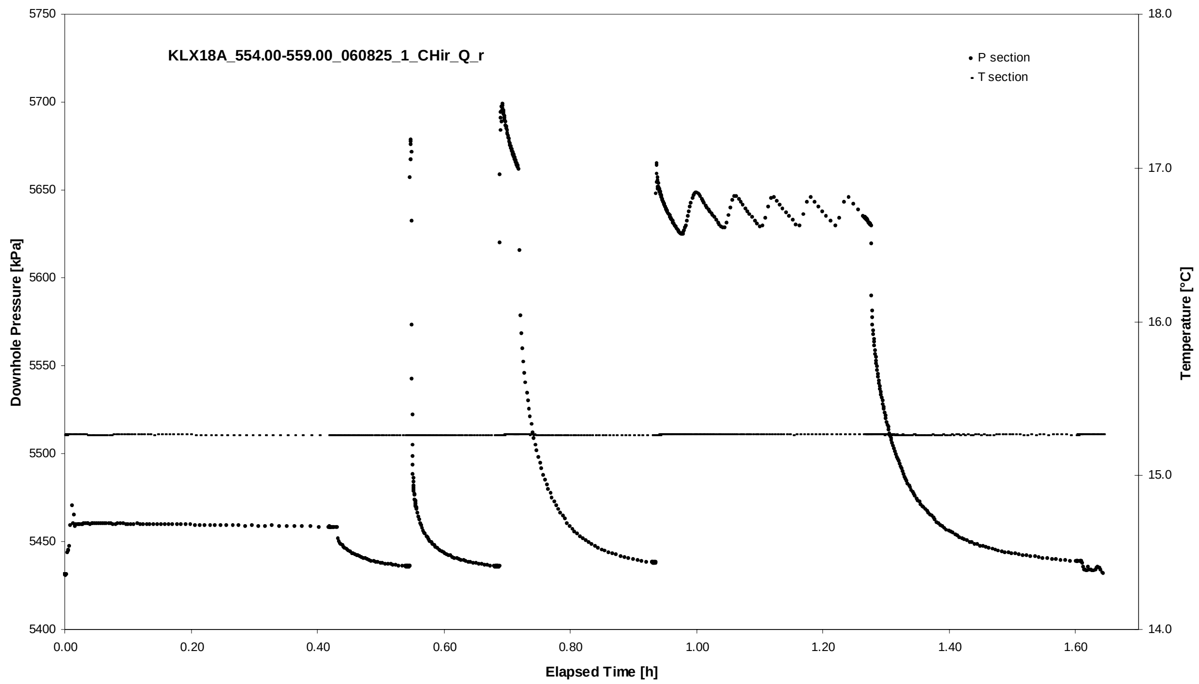
APPENDIX 2-83

Test 554.00 – 559.00 m

Analysis diagrams



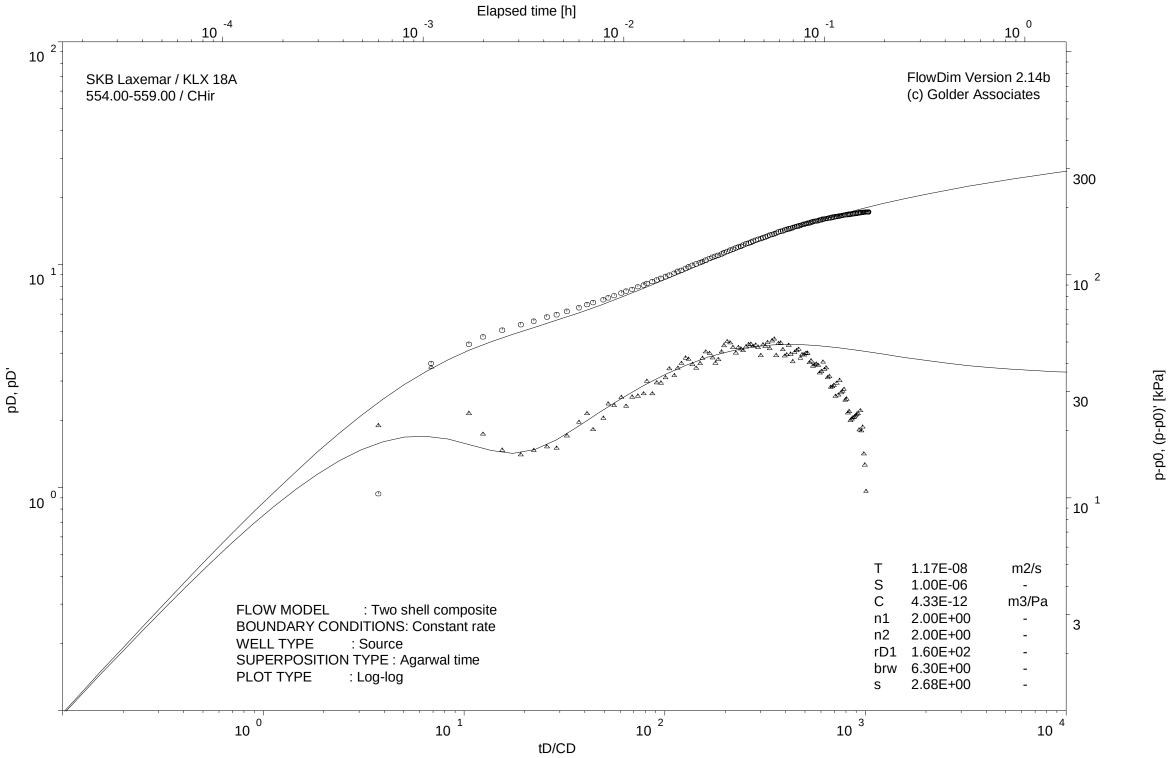
Pressure and flow rate vs. time; cartesian plot



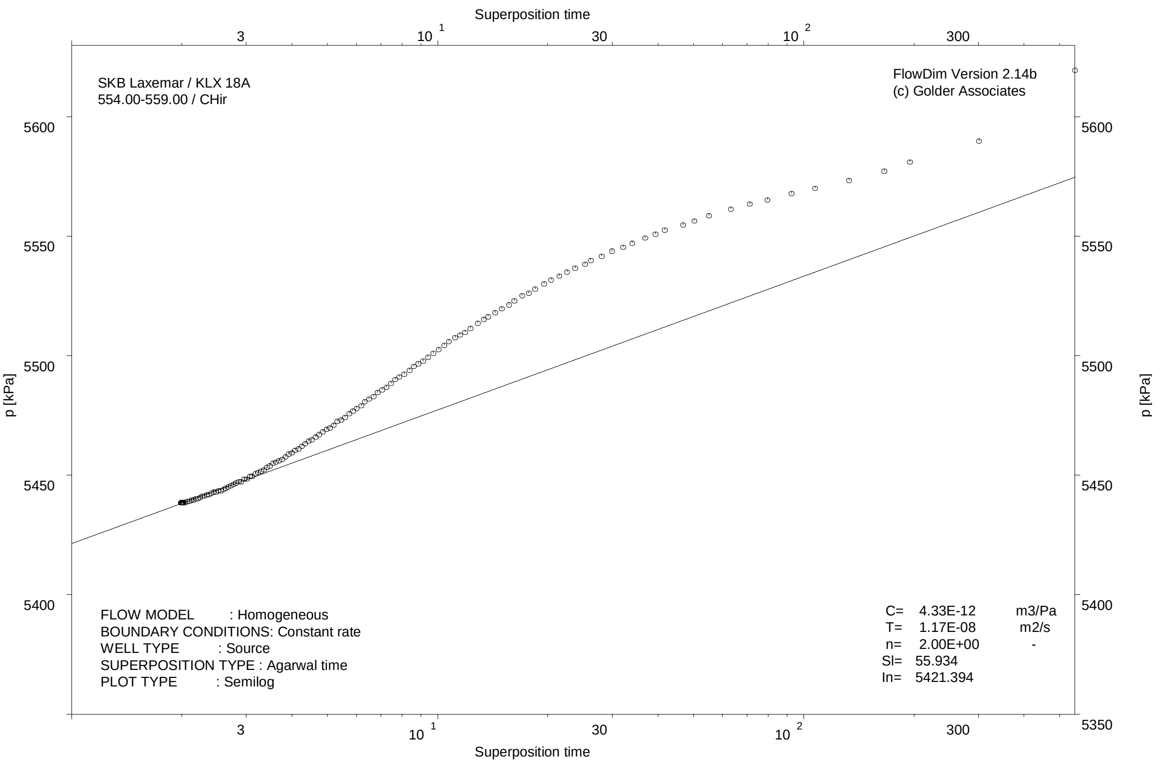
Interval pressure and temperature vs. time; cartesian plot

Not Analysed

CHI phase; log-log match



CHIR phase; log-log match

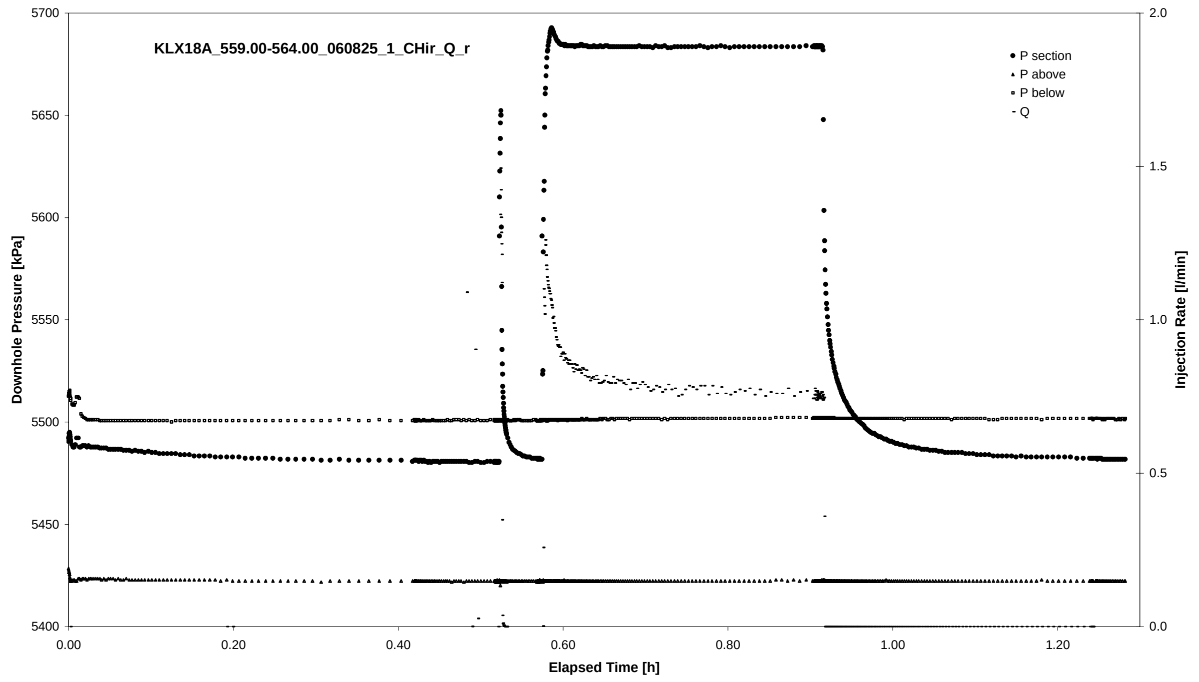


CHIR phase; HORNER match

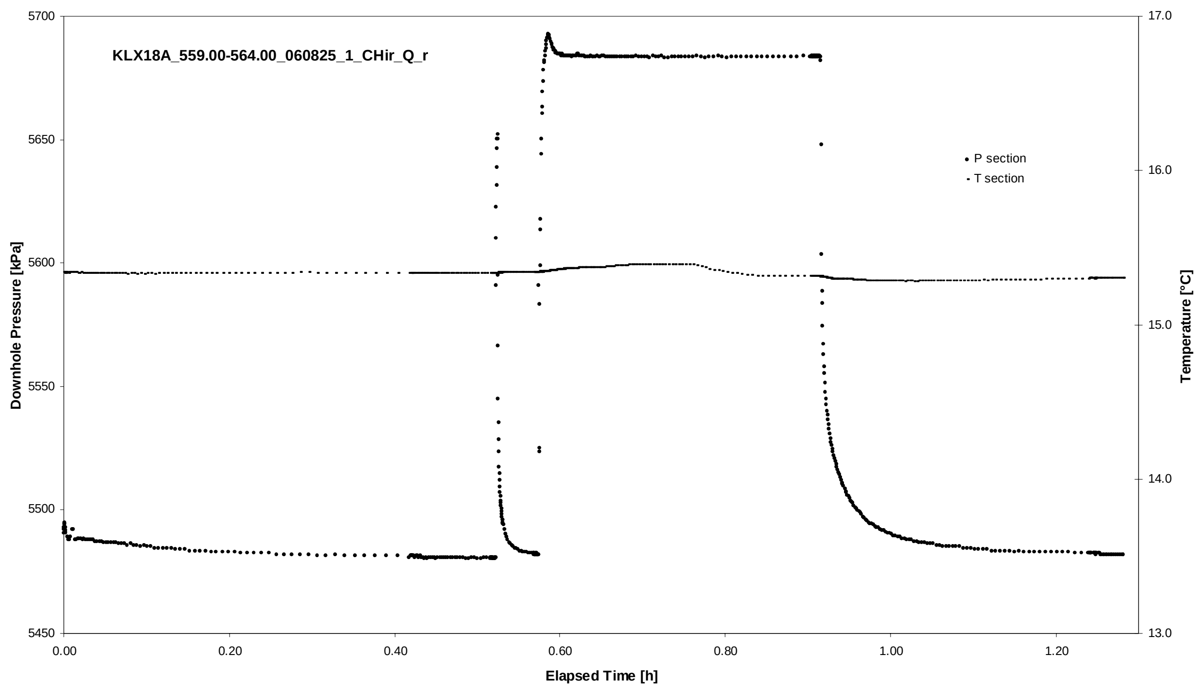
APPENDIX 2-84

Test 559.00 – 564.00 m

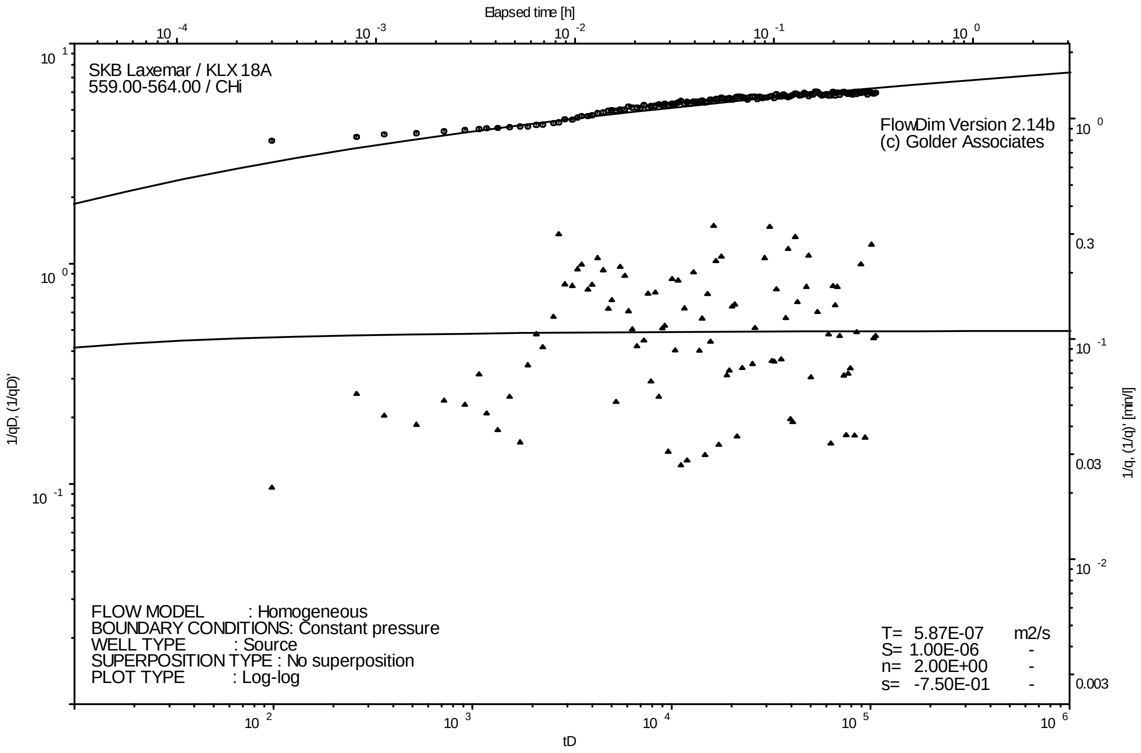
Analysis diagrams



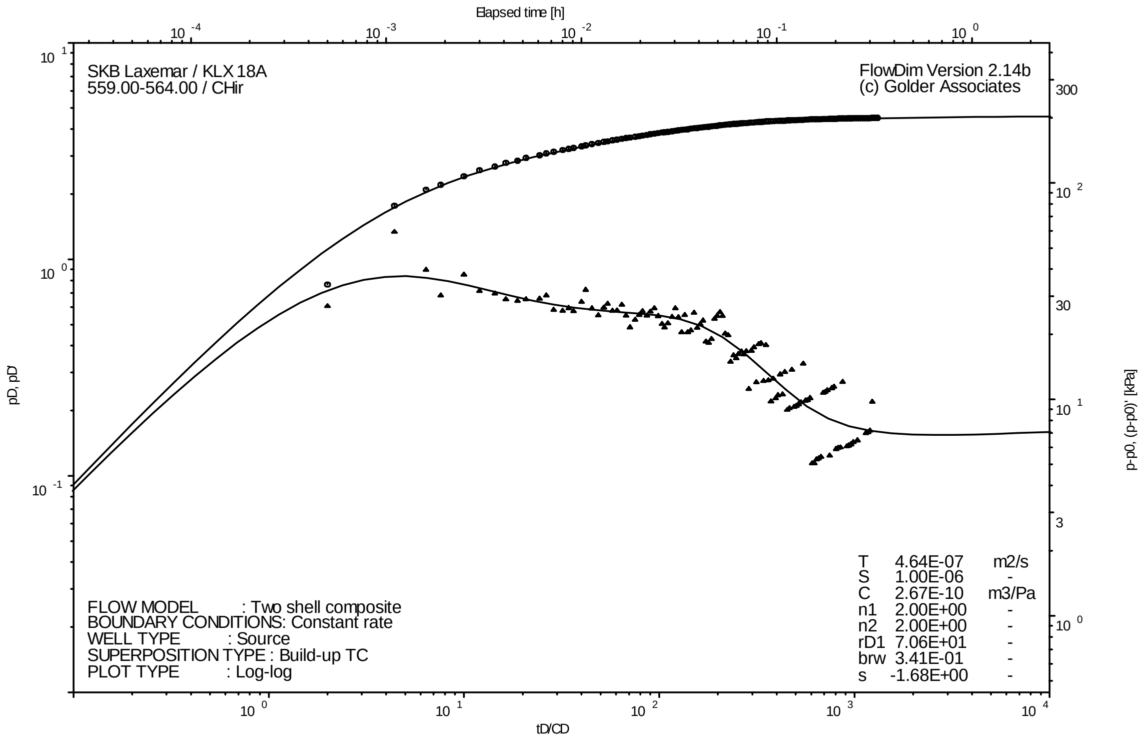
Pressure and flow rate vs. time; cartesian plot



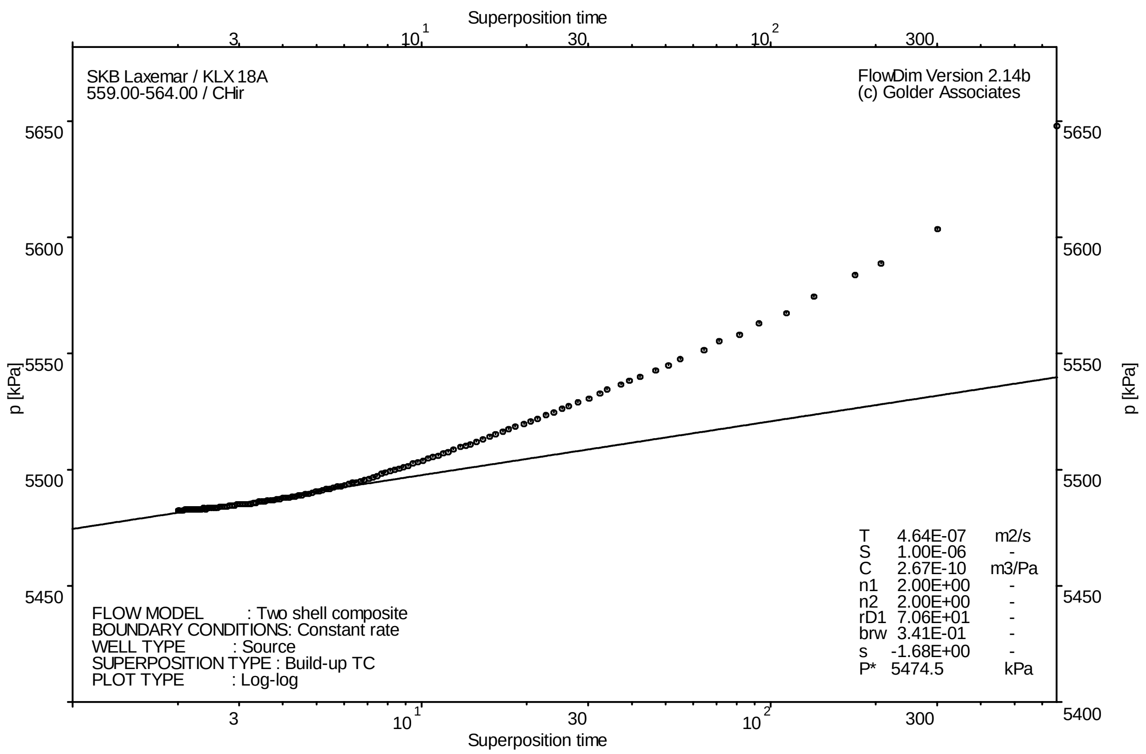
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

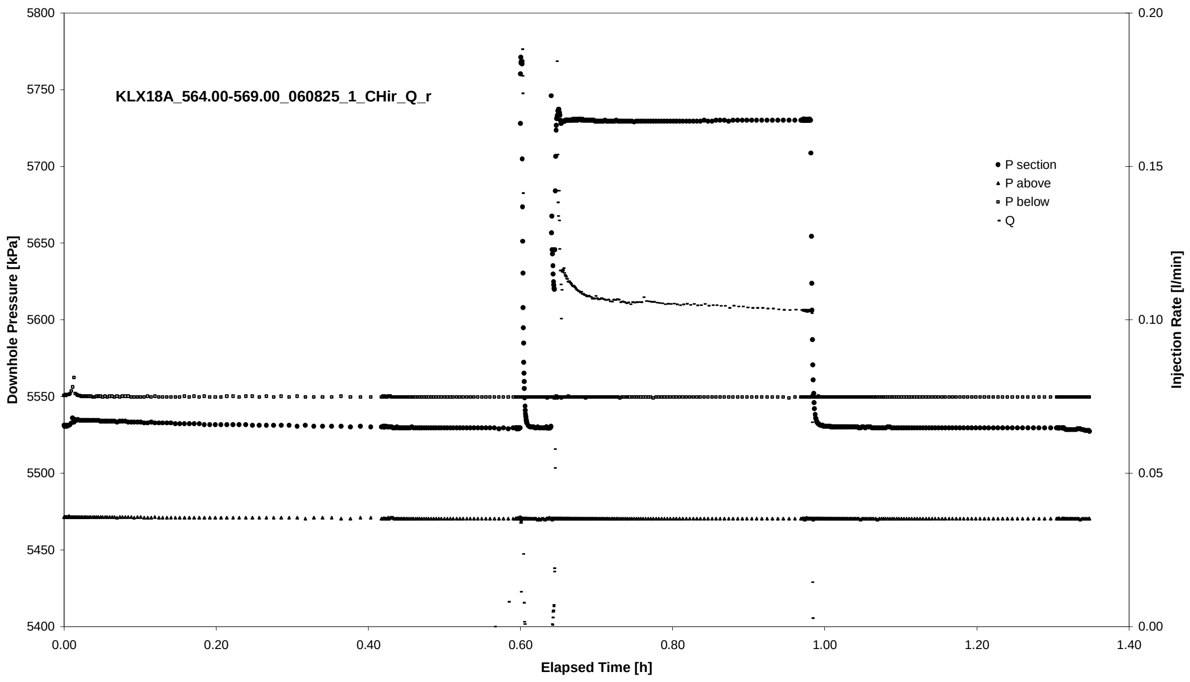


CHIR phase; HORNER match

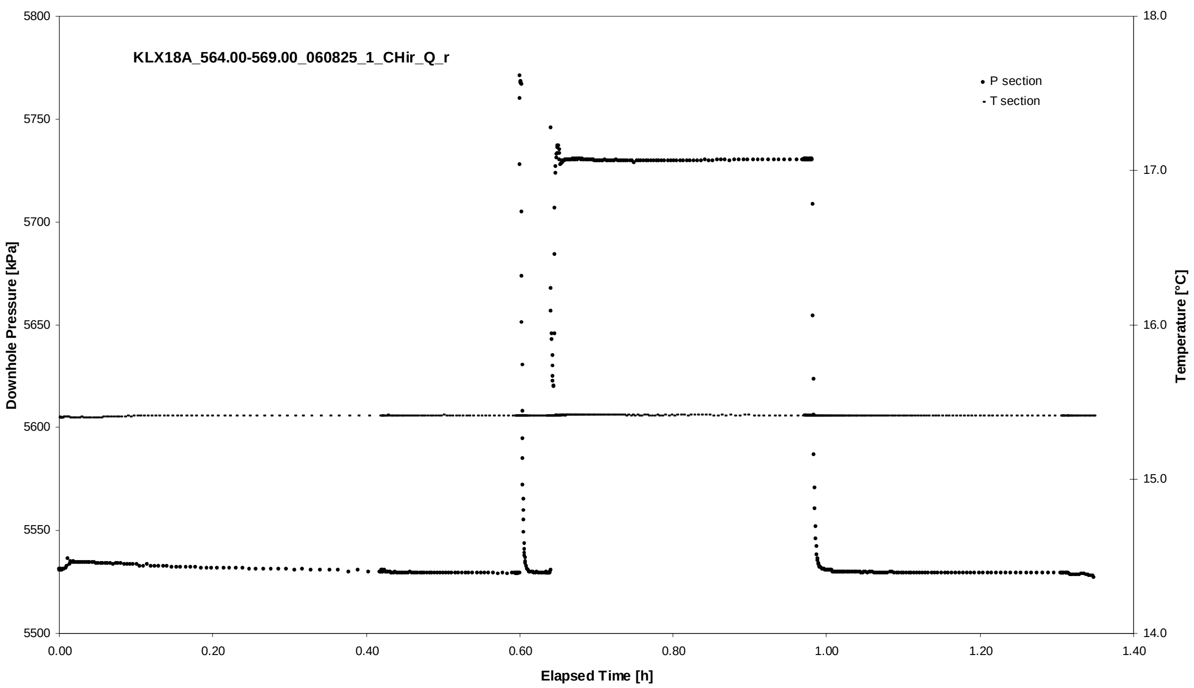
APPENDIX 2-85

Test 564.00 – 569.00 m

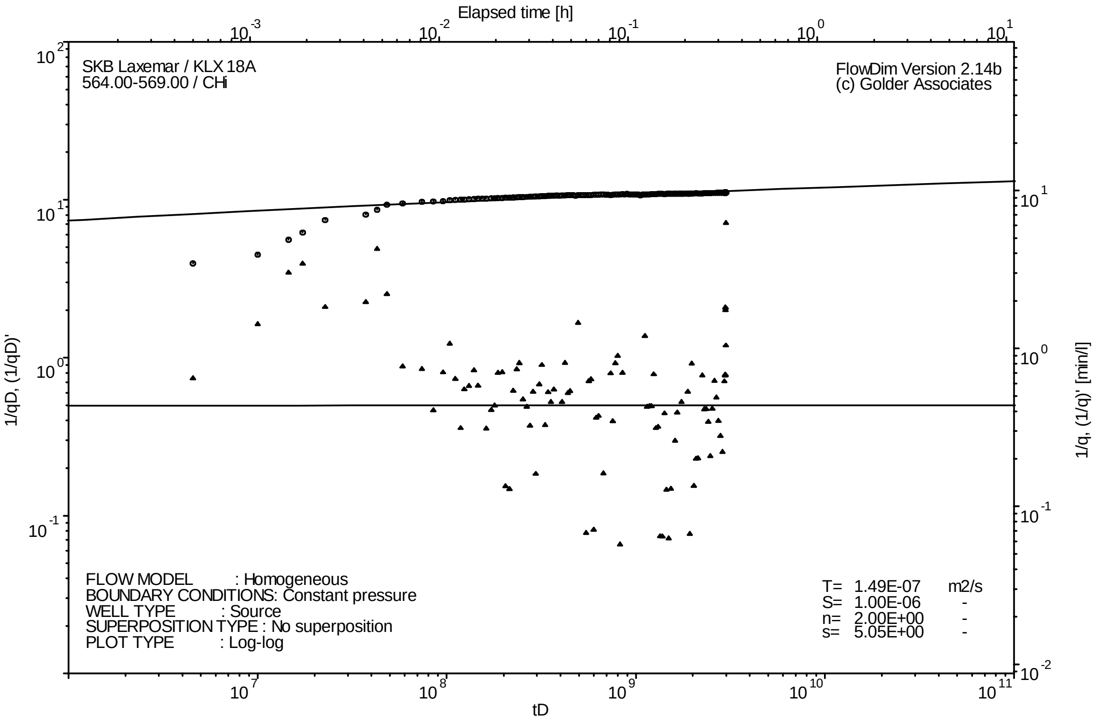
Analysis diagrams



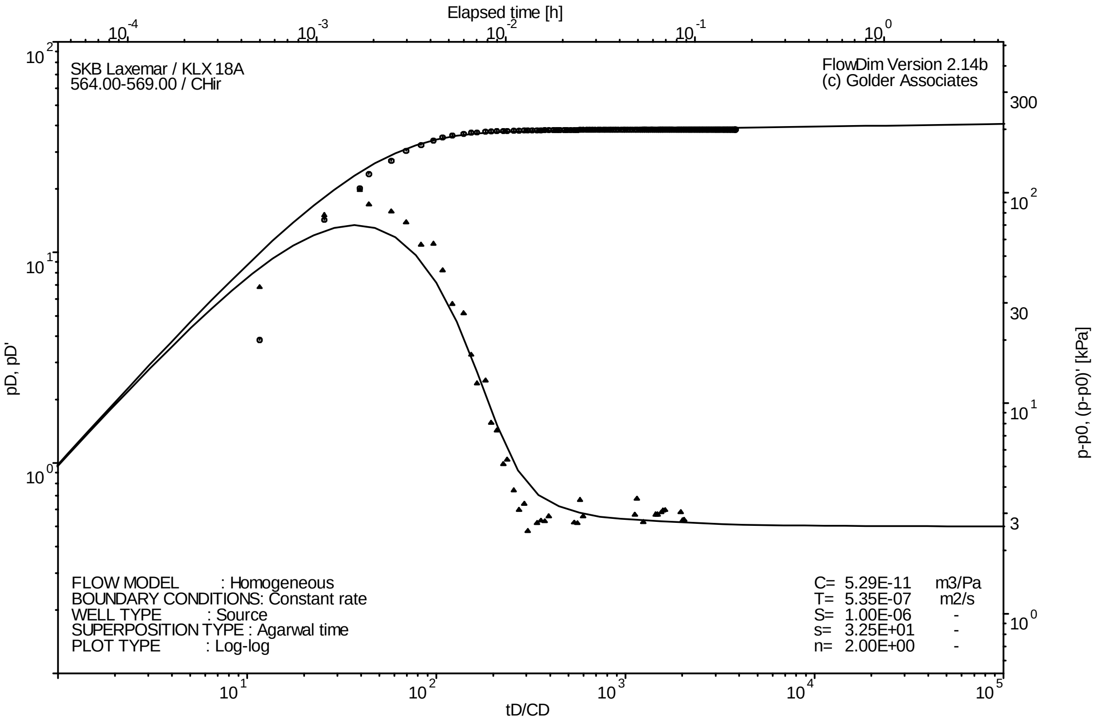
Pressure and flow rate vs. time; cartesian plot



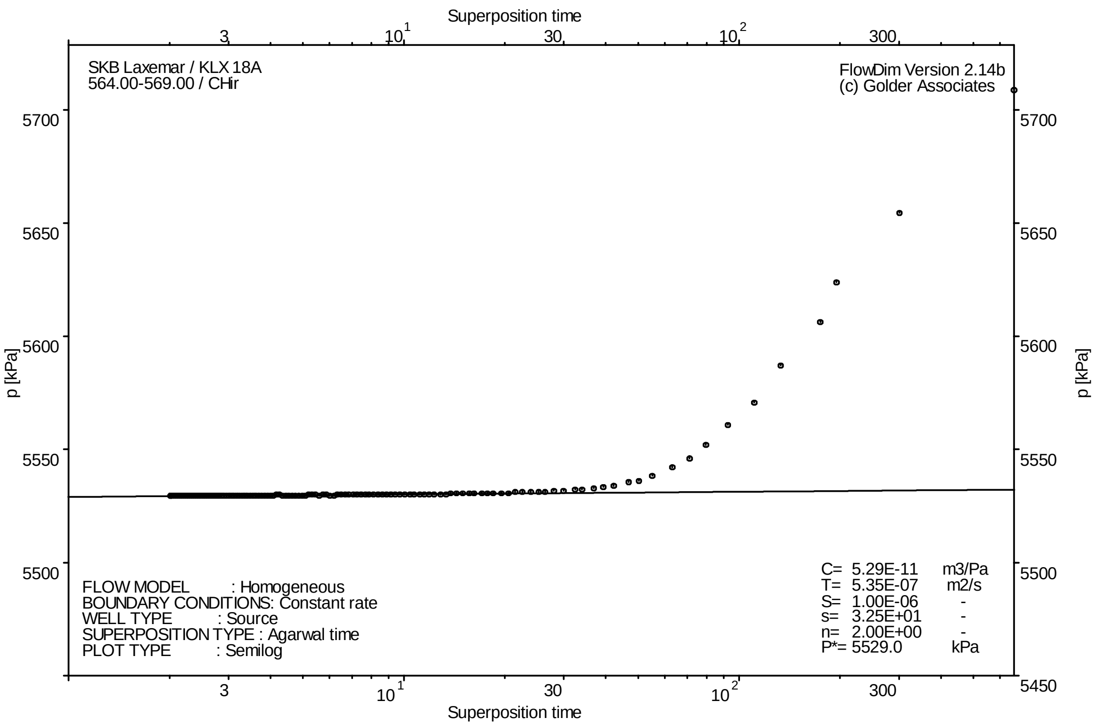
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

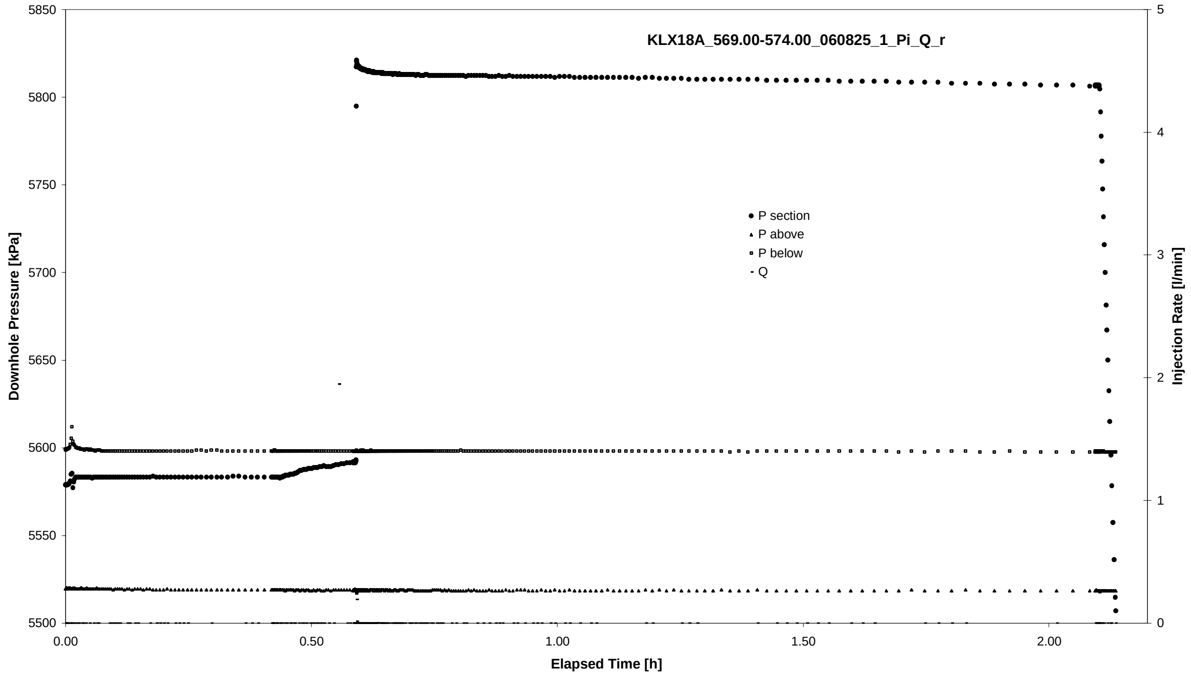


CHIR phase; HORNER match

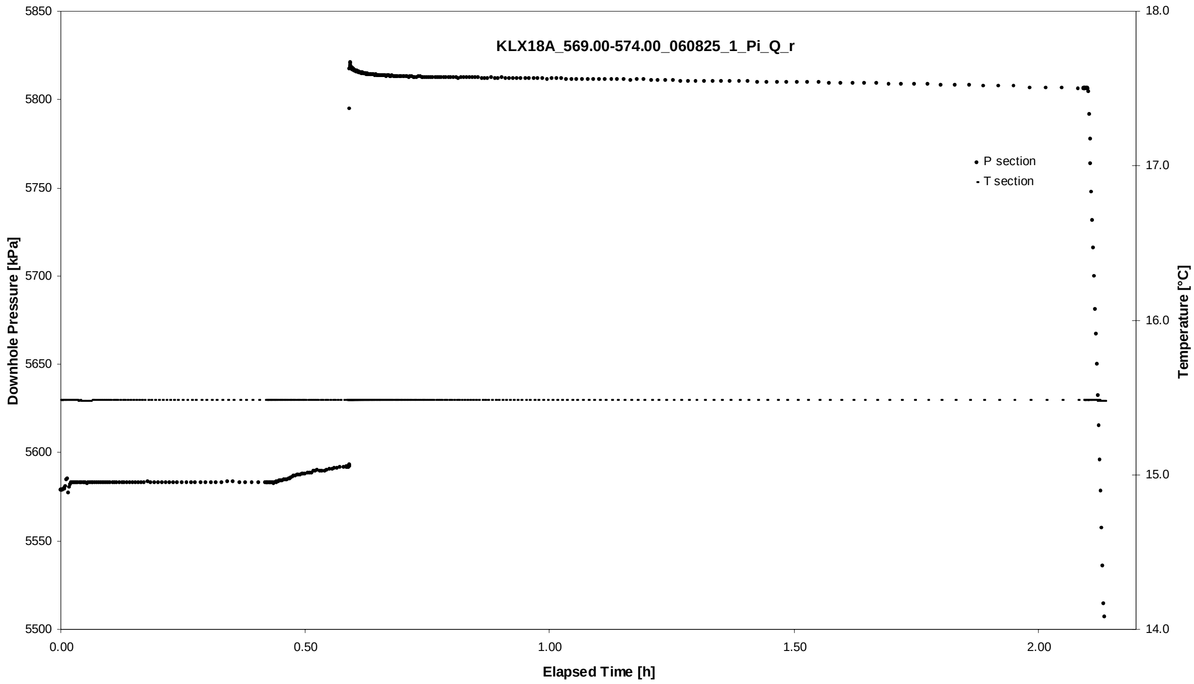
APPENDIX 2-86

Test 569.00 – 574.00 m

Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

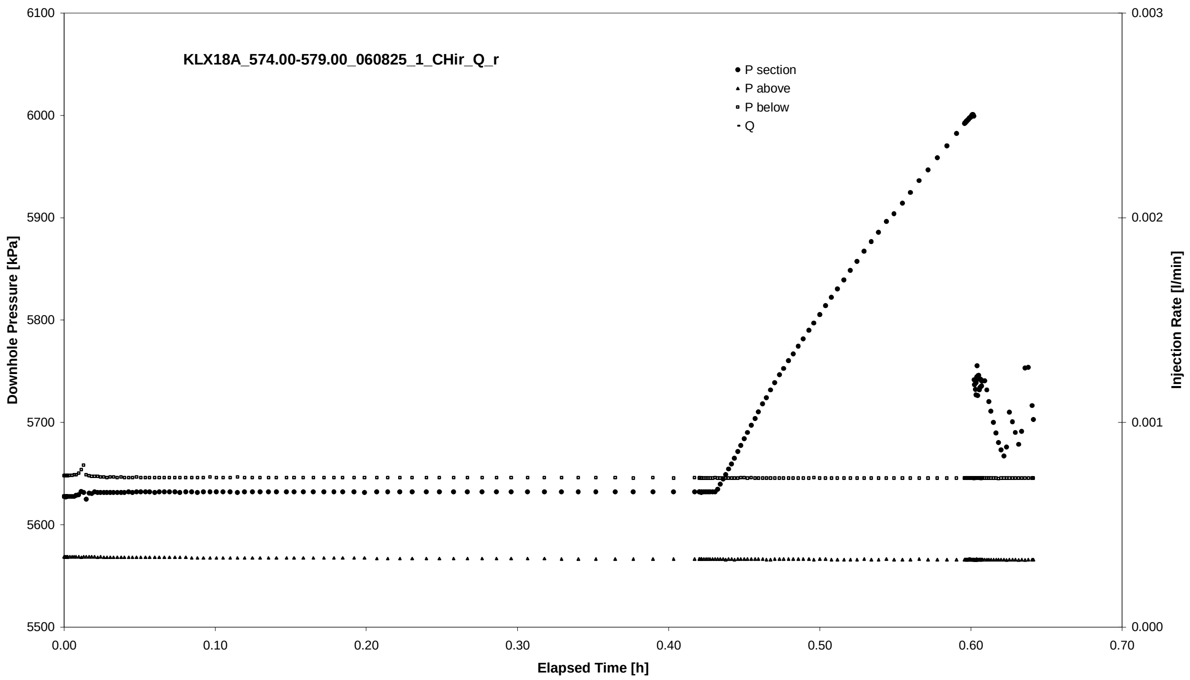
Not Analysed

Pulse injection; deconvolution match

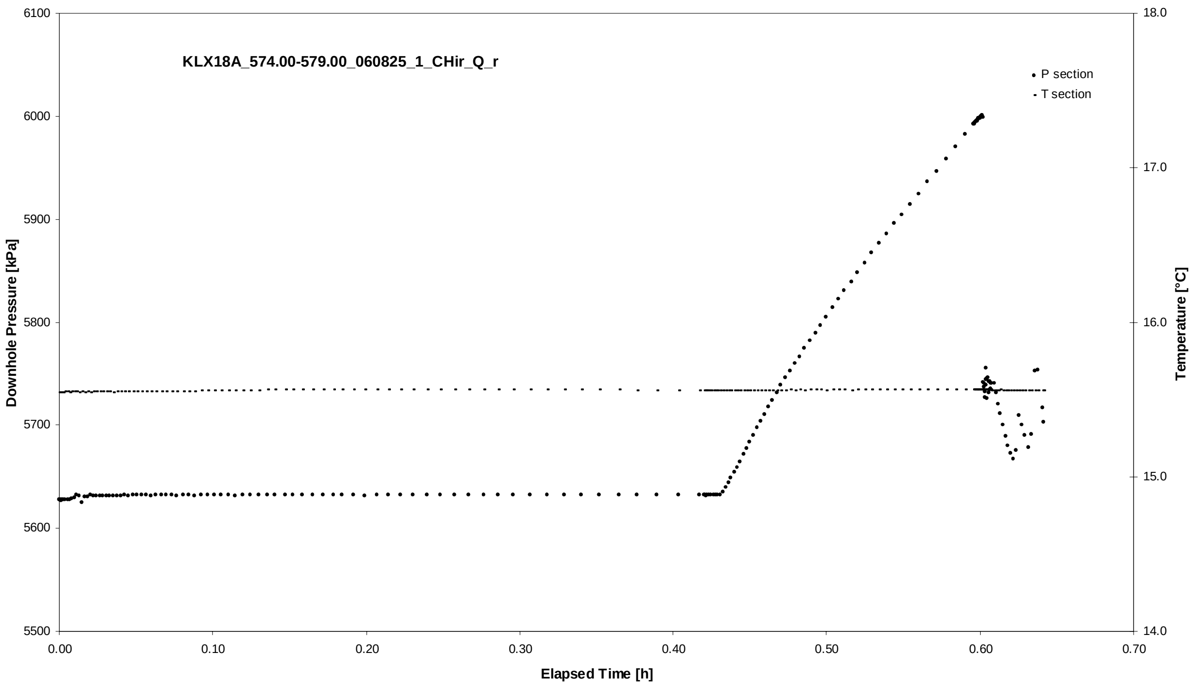
APPENDIX 2-87

Test 574.00 – 579.00 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

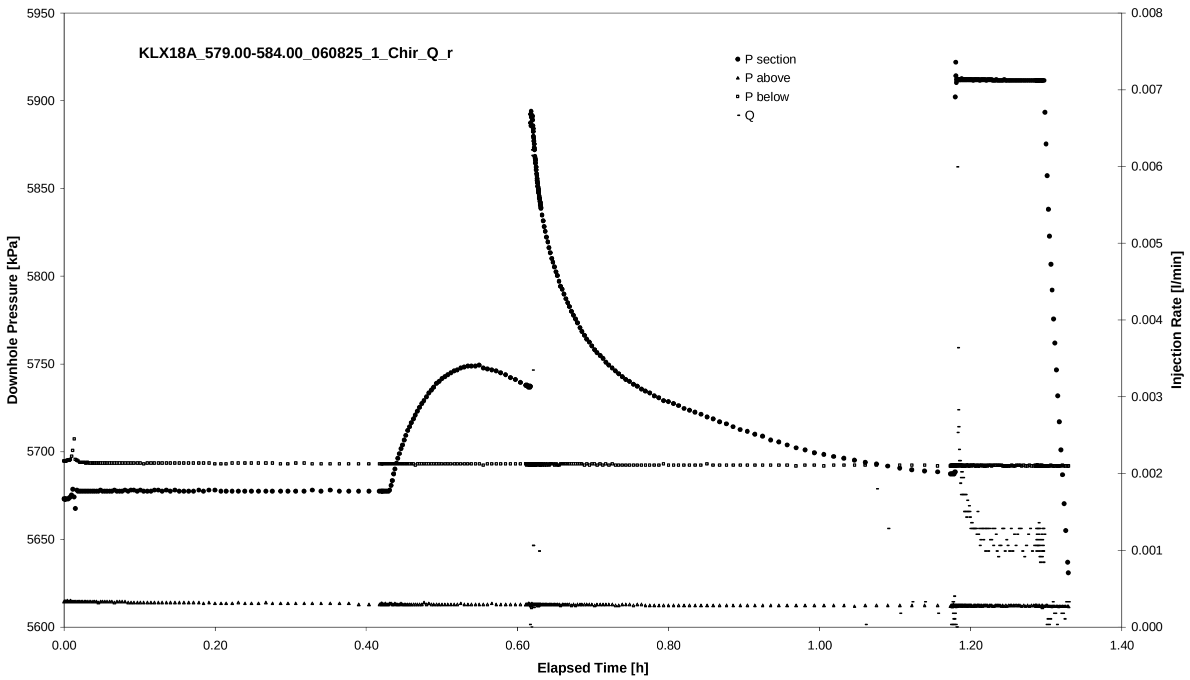
Not Analysed

CHIR phase; HORNER match

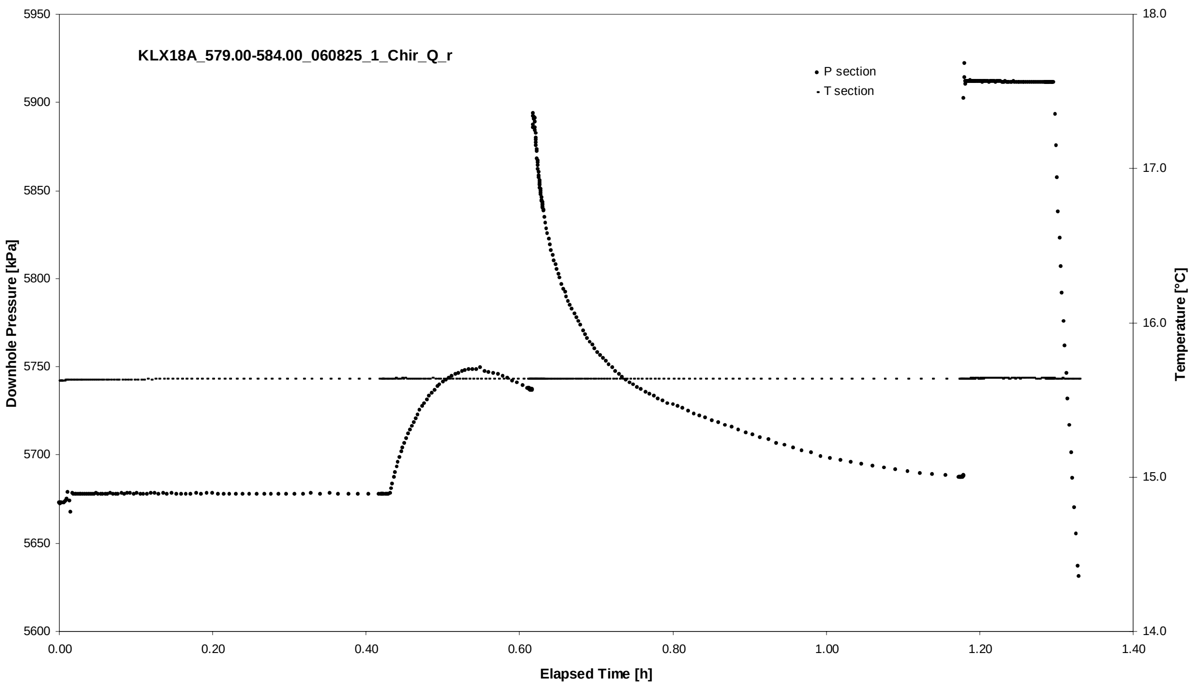
APPENDIX 2-88

Test 579.00 – 584.00 m

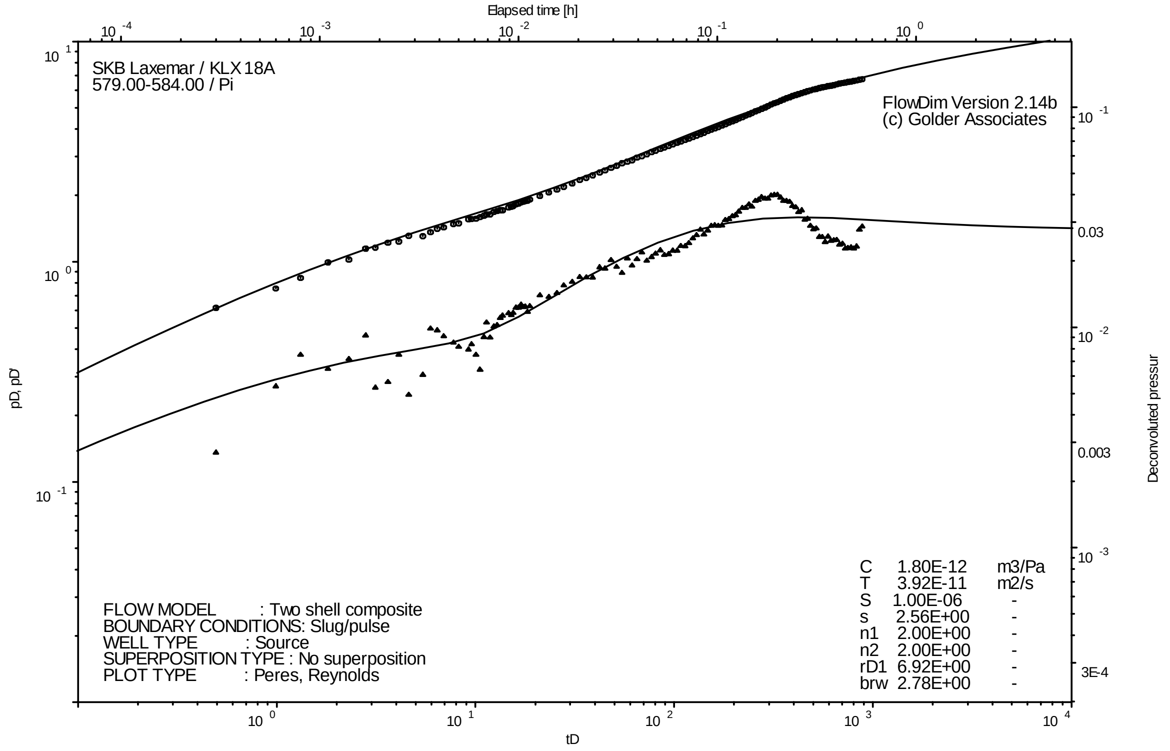
Analysis diagrams



Pressure and flow rate vs. time; cartesian plot



Interval pressure and temperature vs. time; cartesian plot

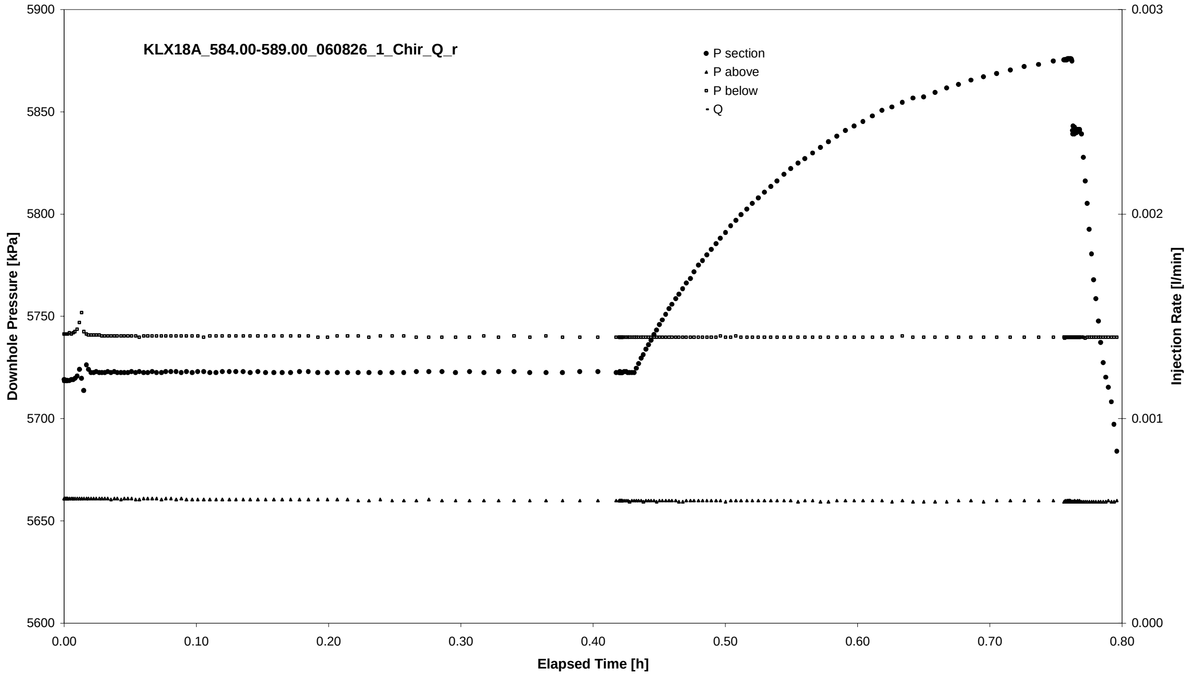


PI phase; deconvolution match

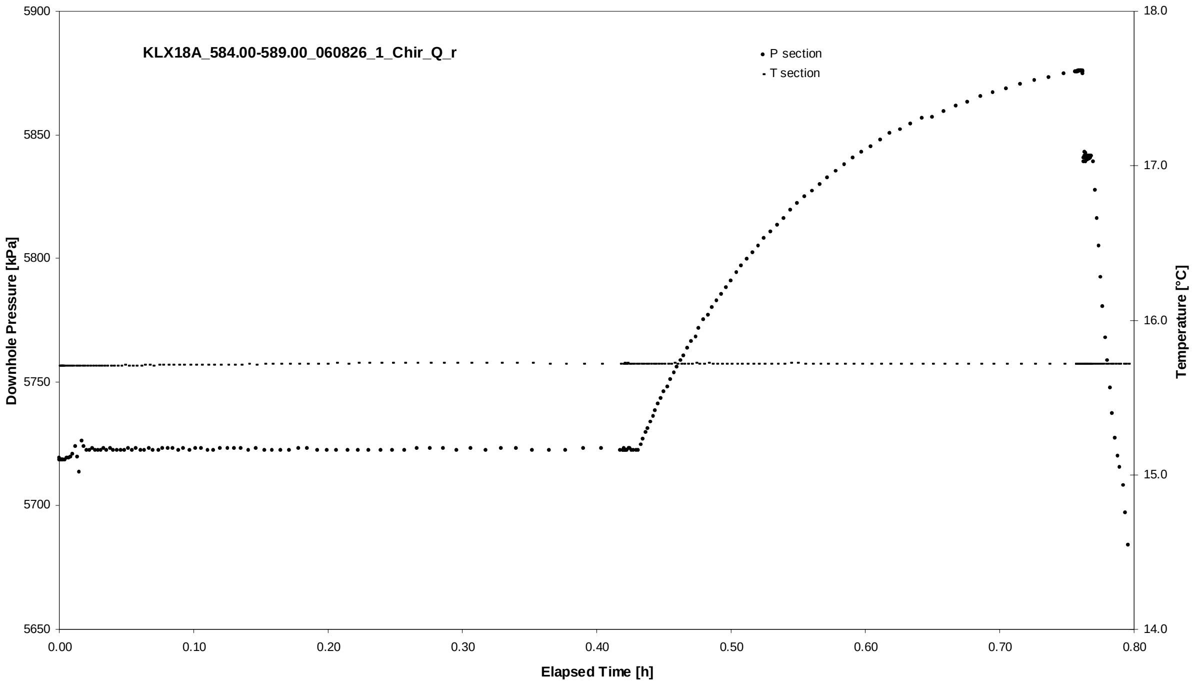
APPENDIX 2-89

Test 584.00 – 589.00 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

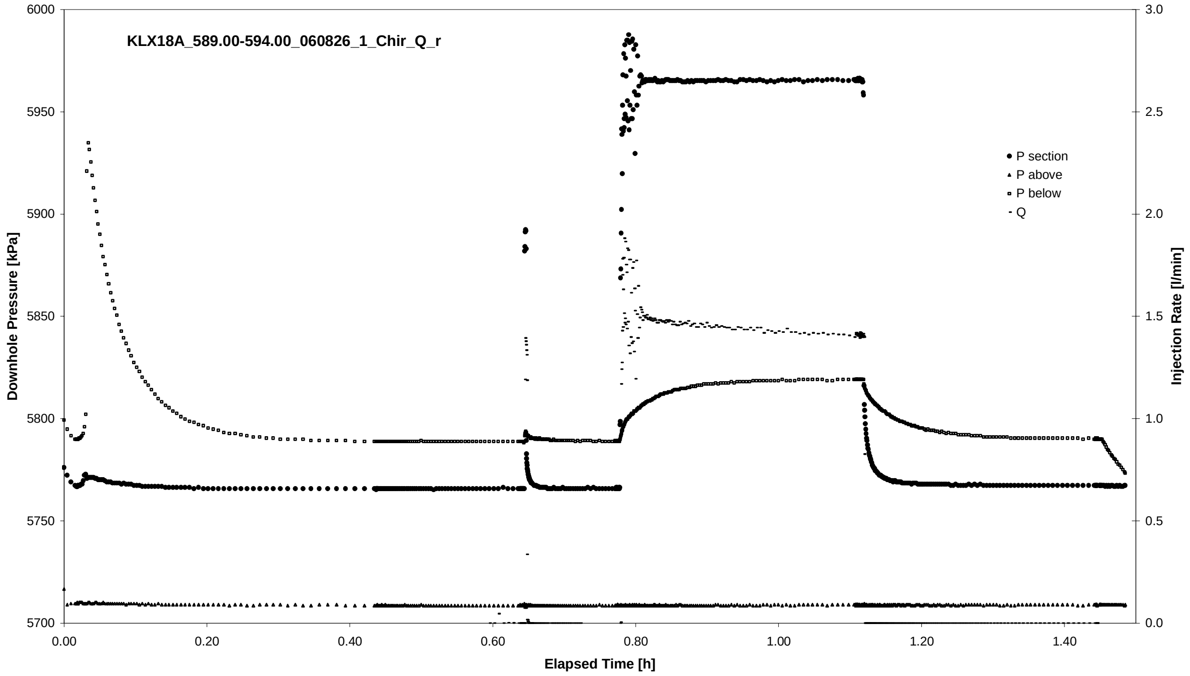
Not Analysed

CHIR phase; HORNER match

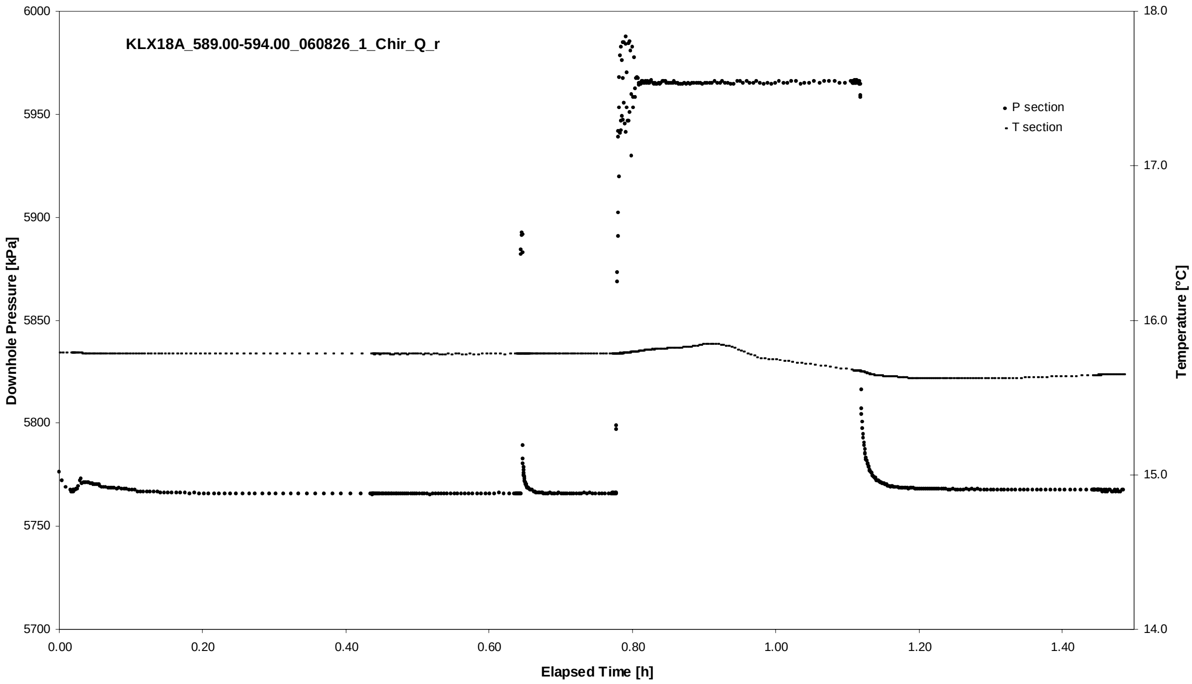
APPENDIX 2-90

Test 589.00 – 594.00 m

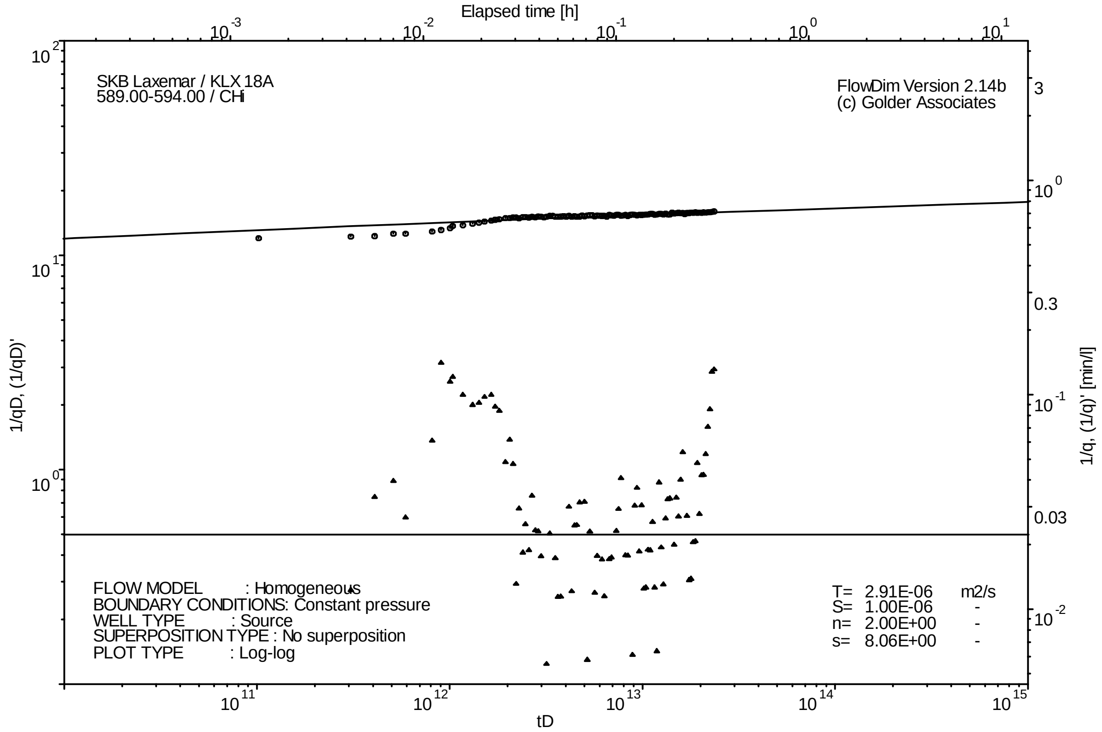
Analysis diagrams



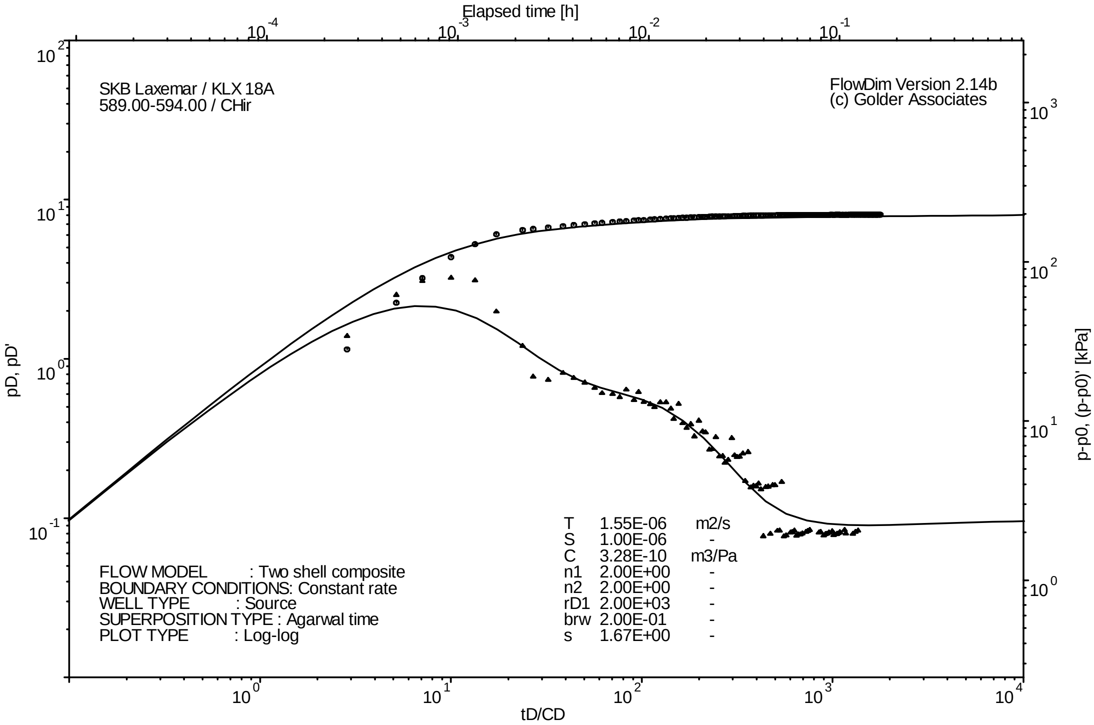
Pressure and flow rate vs. time; cartesian plot



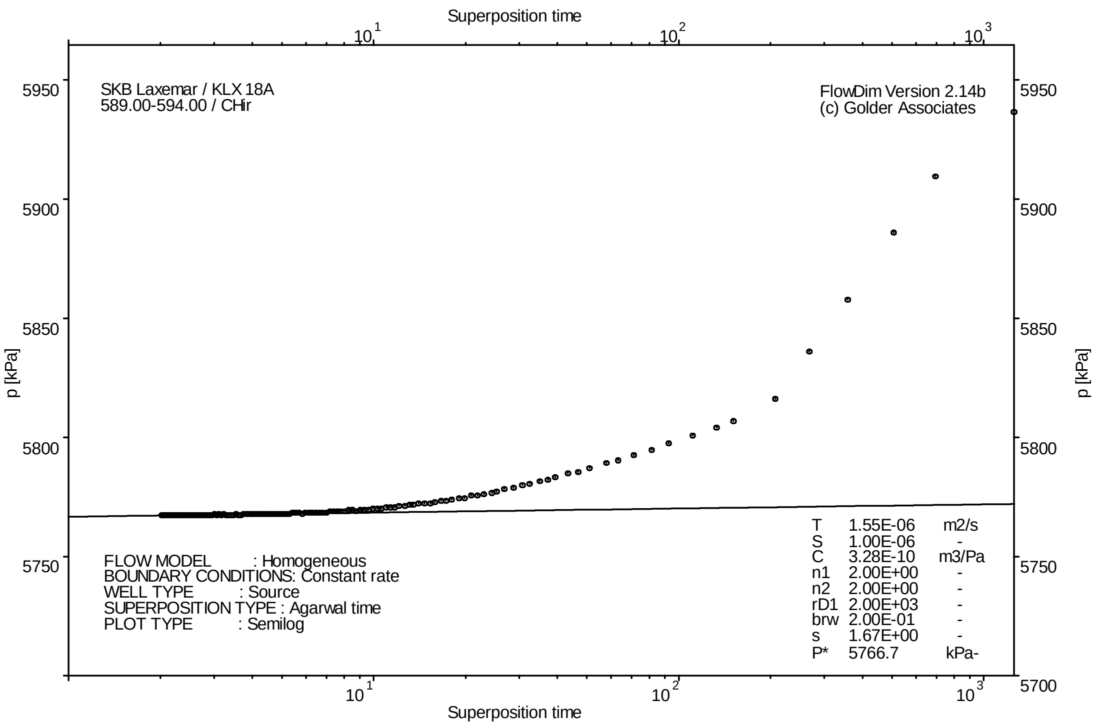
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match

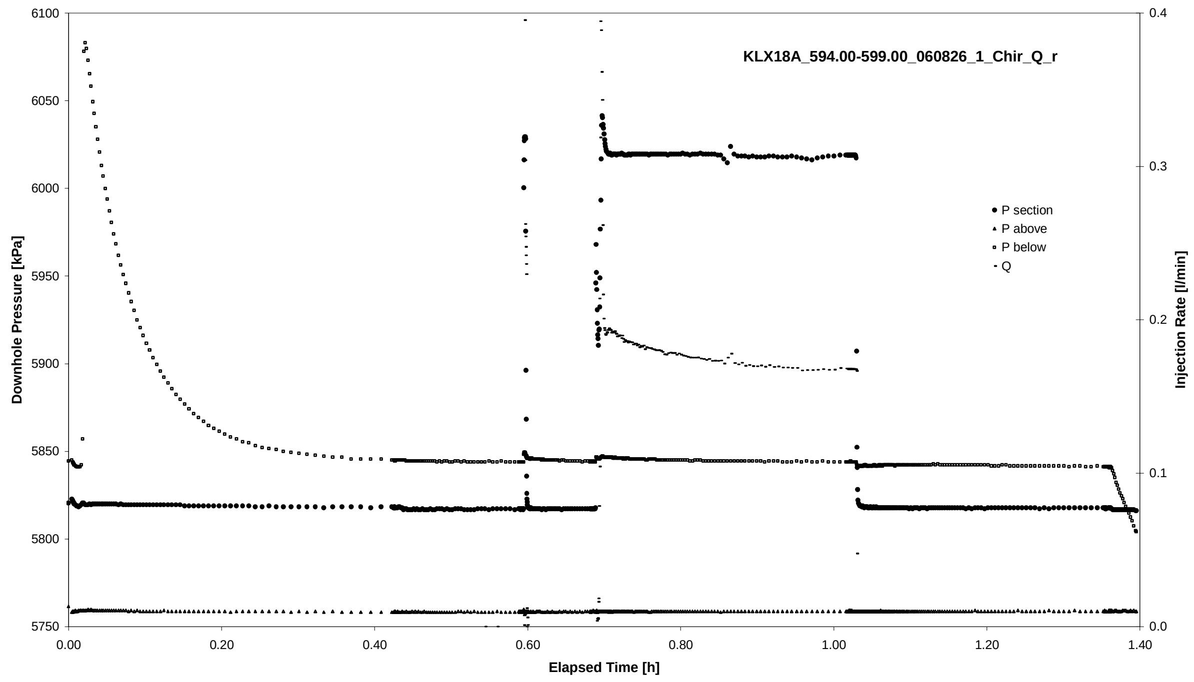


CHIR phase; HORNER match

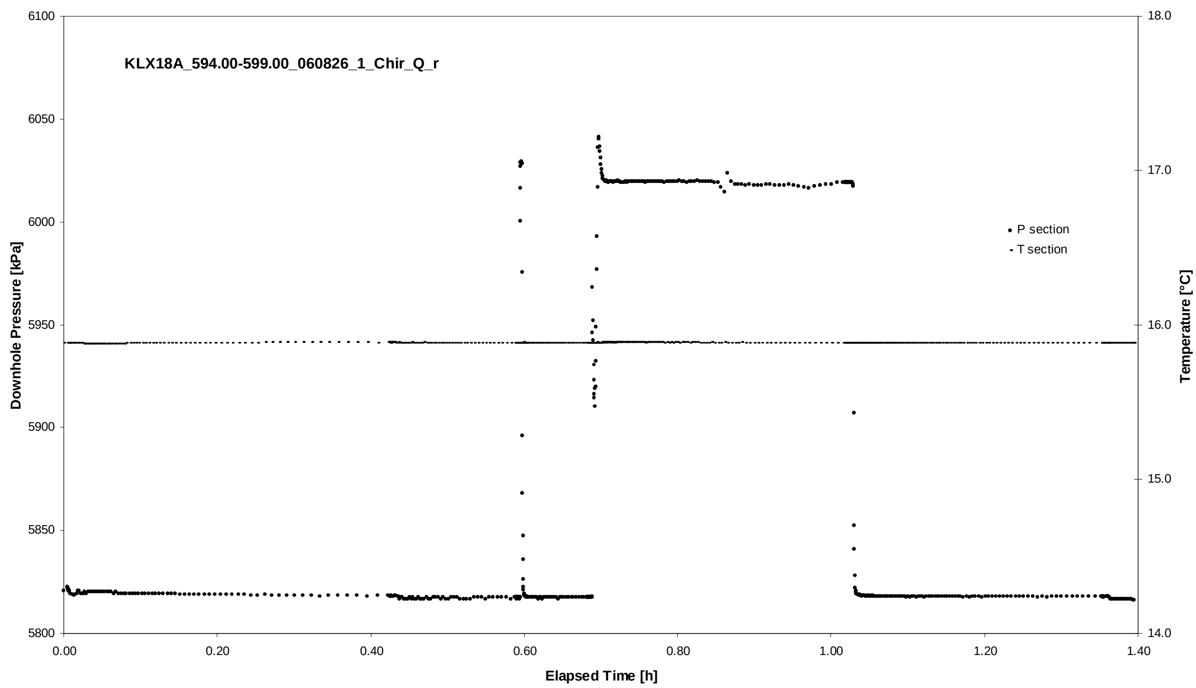
APPENDIX 2-91

Test 594.00 – 599.00 m

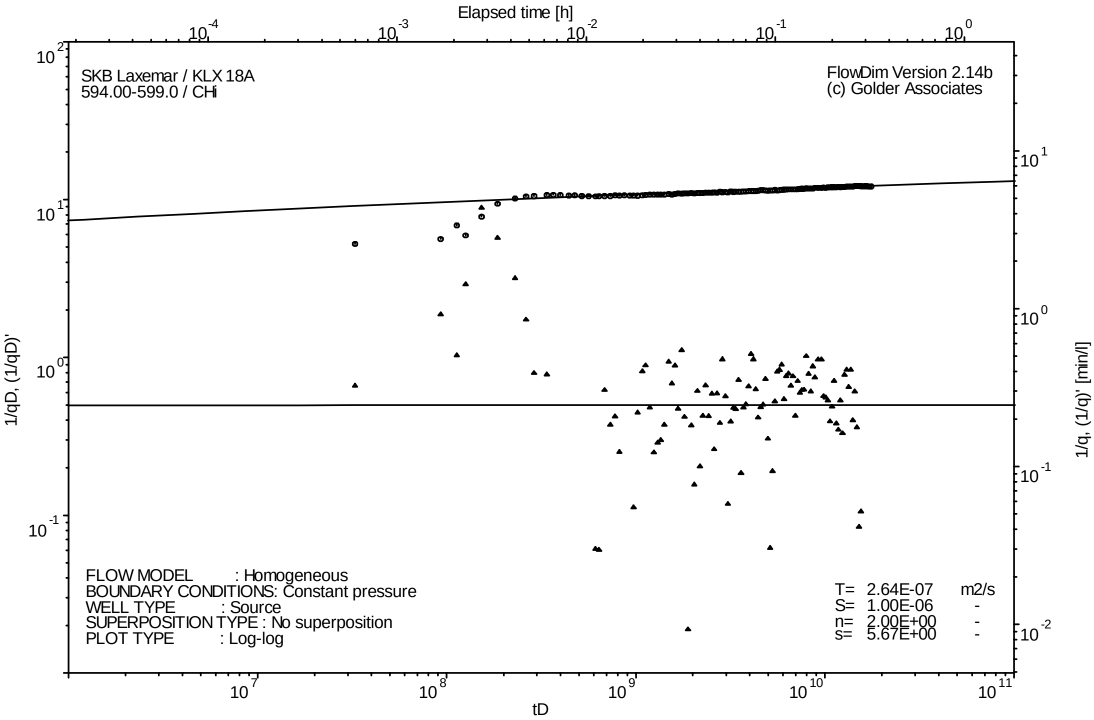
Analysis diagrams



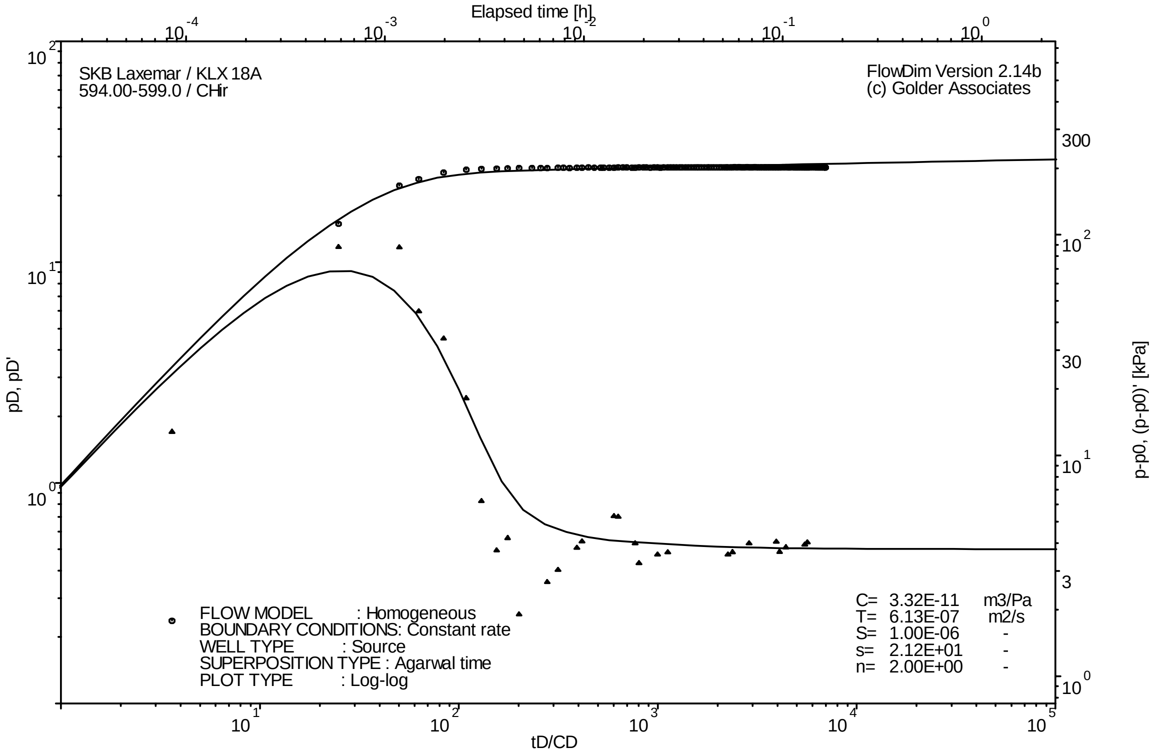
Pressure and flow rate vs. time; cartesian plot



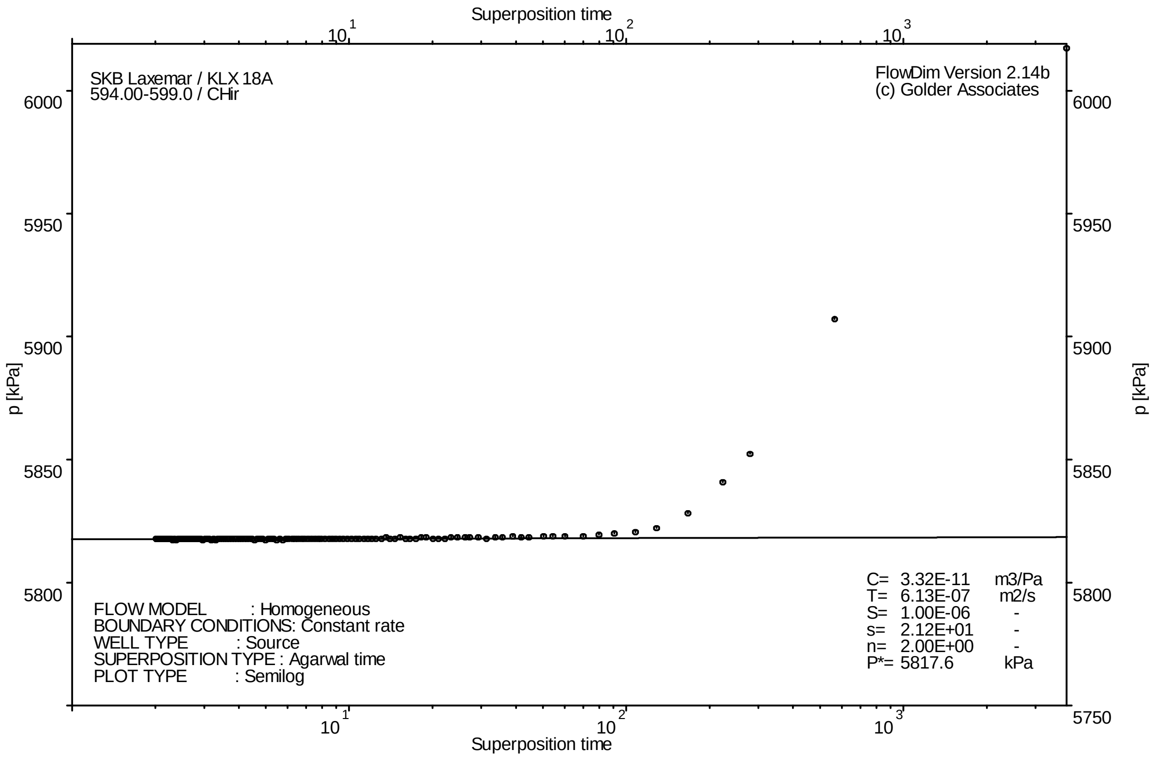
Interval pressure and temperature vs. time; cartesian plot



CHI phase; log-log match



CHIR phase; log-log match



CHIR phase; HORNER match

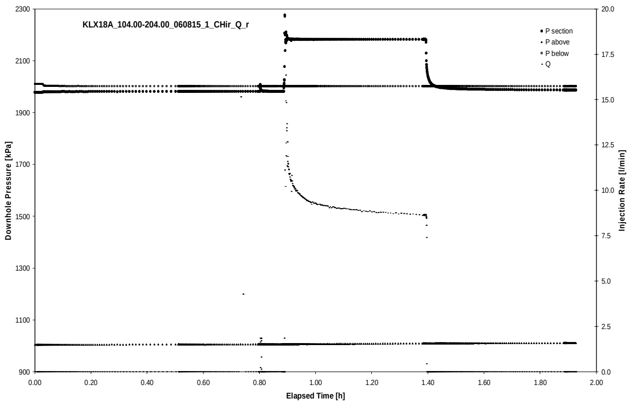
APPENDIX 3

Test Summary Sheets

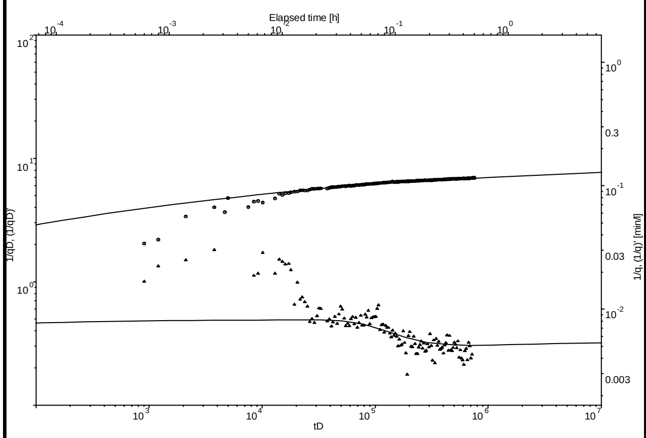
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060815 10:44
Test section from - to (m):	104.00-204.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

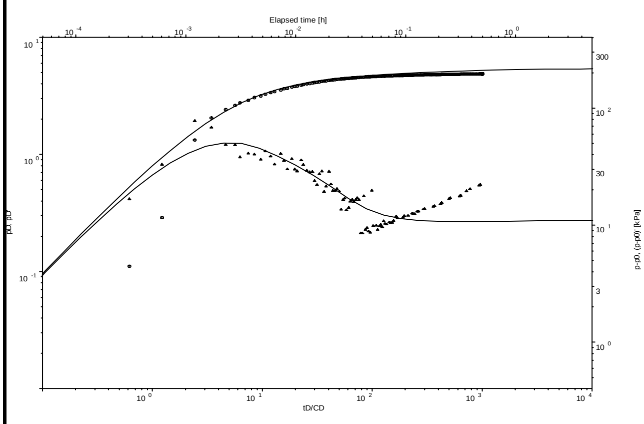
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	1978		
p_i (kPa) =	1978		
p_p(kPa) =	2178	p_F (kPa) =	1987
Q_p (m^3/s)=	1.42E-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)=	9.7		
Derivative fact.=	0.12	Derivative fact.=	0.00
Results		**Results**	
Q/s (m^2/s)=	7.0E-06		
T_M (m^2/s)=	9.1E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.90	dt_1 (min) =	3.00
dt_2 (min) =	3.00	dt_2 (min) =	6.00
T (m^2/s) =	7.8E-06	T (m^2/s) =	6.0E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	7.8E-08	K_s (m/s) =	6.0E-08
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.8E-09
C_D (-) =	NA	C_D (-) =	7.5E-01
ξ (-) =	-1.28	ξ (-) =	-2.15
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) =	0.90	C (m^3/Pa) =	6.8E-09
dt_2 (min) =	3.00	C_D (-) =	7.5E-01
T_T (m^2/s) =	7.8E-06	ξ (-) =	-1.28
S (-) =	1.0E-06		
K_s (m/s) =	7.8E-08		
S_s (1/m) =	1.0E-08		

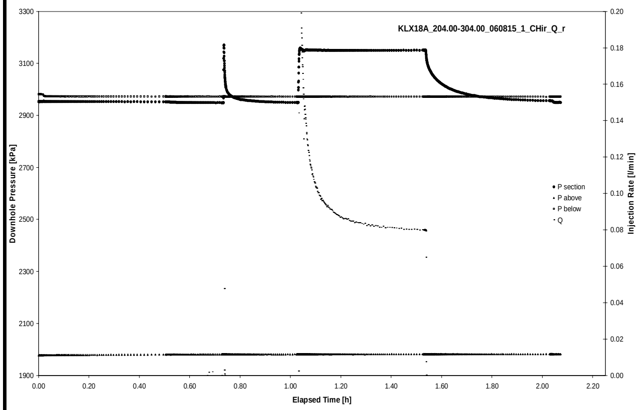
Comments:

The recommended transmissivity of 7.8E-6 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 5E-6 to 1E-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 1,983.6 kPa.

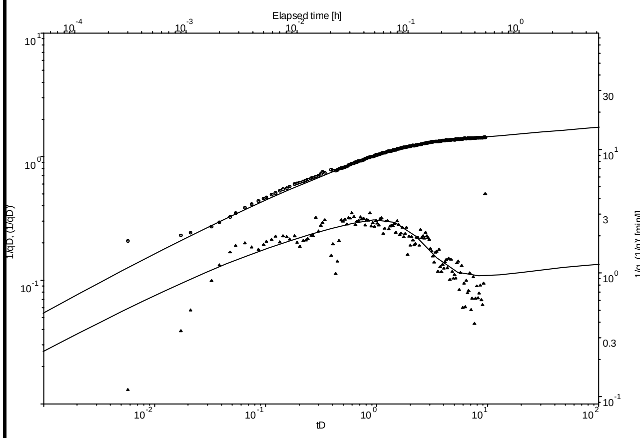
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060815 14:05
Test section from - to (m):	204.00-304.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

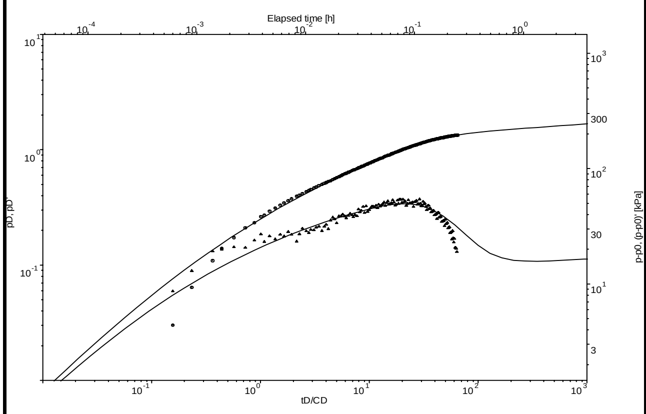
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2954		
p_i (kPa) =	2950		
p_p(kPa) =	3150	p_F (kPa) =	2954
Q_p (m^3/s)=	1.32E-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)=	11.3		
Derivative fact.=	0.05	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	6.5E-08		
T_M (m^2/s)=	8.4E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	6.00	dt_1 (min) =	1.20
dt_2 (min) =	18.00	dt_2 (min) =	3.60
T (m^2/s) =	1.5E-08	T (m^2/s) =	1.7E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.5E-10	K_s (m/s) =	1.7E-10
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.5E-10
C_D (-) =	NA	C_D (-) =	1.6E-02
ξ (-) =	-3.79	ξ (-) =	-3.69
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) =	6.00	C (m^3/Pa) =	1.5E-10
dt_2 (min) =	18.00	C_D (-) =	1.6E-02
T_T (m^2/s) =	1.5E-08	ξ (-) =	-3.79
S (-) =	1.0E-06		
K_s (m/s) =	3.0E-09		
S_s (1/m) =	2.0E-07		

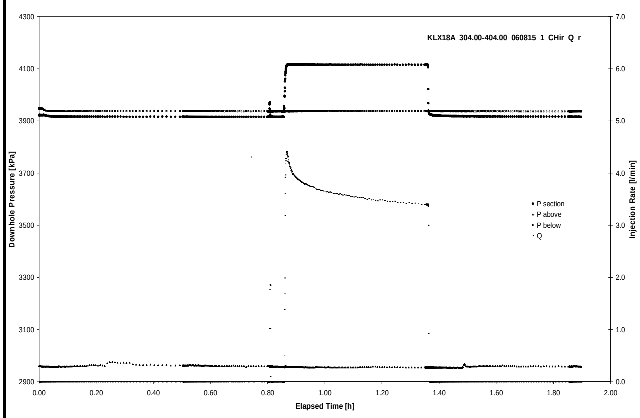
Comments:

The recommended transmissivity of 1.5E-8 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 8E-9 m2/s to 3E-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 2,938.0 kPa.

Test Summary Sheet

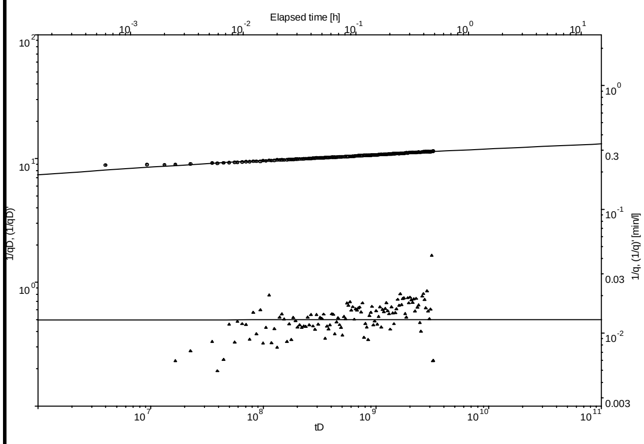
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060815 17:25
Test section from - to (m):	304.00-404.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

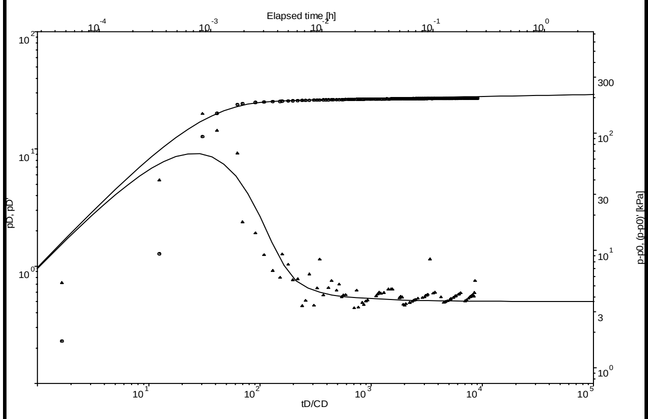


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3923		
p_i (kPa) =	3915		
p_p(kPa) =	4114	p_F (kPa) =	3915
Q_p (m^3/s)=	5.63E-05		
tp (s) =	1800	t_F (s) =	1800
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.8		
Derivative fact.=	0.07	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.8E-06		
T_M (m^2/s)=	3.6E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.60	dt_1 (min) =	0.36
dt_2 (min) =	18.00	dt_2 (min) =	12.00
T (m^2/s) =	5.1E-06	T (m^2/s) =	1.5E-05
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.1E-08	K_s (m/s) =	1.5E-07
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	9.6E-10
C_D (-) =	NA	C_D (-) =	1.1E-01
ξ (-) =	3.13	ξ (-) =	19.60
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) =	0.60	C (m^3/Pa) =	9.6E-10
dt_2 (min) =	18.00	C_D (-) =	1.1E-01
T_T (m^2/s) =	5.1E-06	ξ (-) =	3.13
S (-) =	1.0E-06		
K_s (m/s) =	1.0E-06		
S_s (1/m) =	2.0E-07		

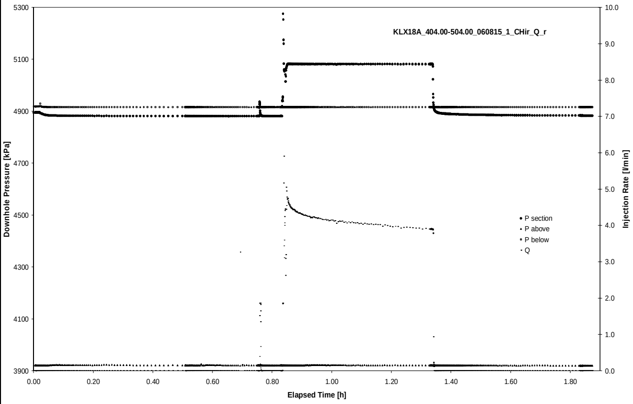
Comments:

The recommended transmissivity of 5.1•10-6 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 2E-6 m2/s to 8E-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 3,915.6 kPa.

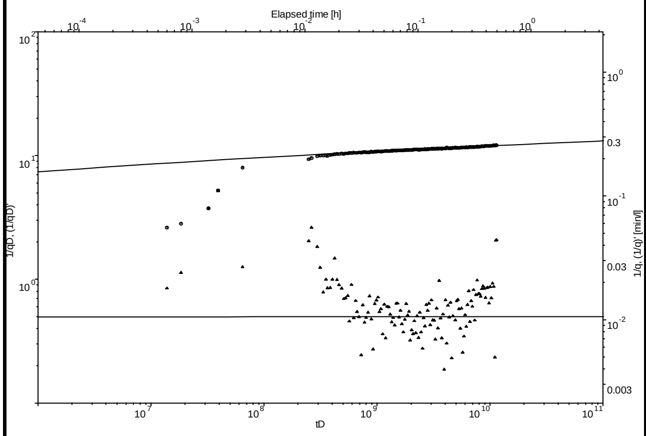
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060815 21:08
Test section from - to (m):	404.00-504.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

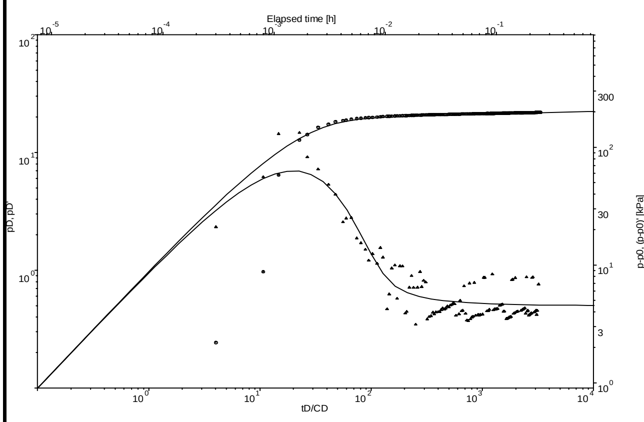
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4895		
p_i (kPa) =	4881		
p_p(kPa) =	5081	p_F (kPa) =	4883
Q_p (m^3/s)=	6.48E-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)=	14.5		
Derivative fact.=	0.06	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	3.2E-06		
T_M (m^2/s)=	4.1E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.80	dt_1 (min) =	1.20
dt_2 (min) =	18.00	dt_2 (min) =	15.00
T (m^2/s) =	6.1E-06	T (m^2/s) =	1.2E-05
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	6.1E-08	K_s (m/s) =	1.2E-07
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.1E-09
C_D (-) =	NA	C_D (-) =	2.3E-01
ξ (-) =	3.66	ξ (-) =	13.40
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) =	1.80	C (m^3/Pa) =	2.1E-09
dt_2 (min) =	18.00	C_D (-) =	2.3E-01
T_T (m^2/s) =	6.1E-06	ξ (-) =	3.66
S (-) =	1.0E-06		
K_s (m/s) =	1.2E-06		
S_s (1/m) =	2.0E-07		

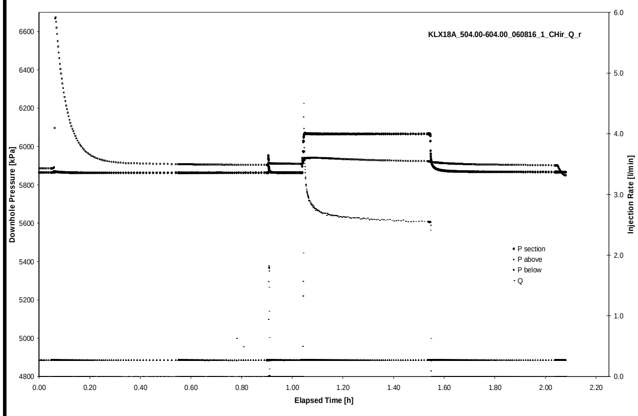
Comments:

The recommended transmissivity of 6.1E-6 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 2E-6 m2/s to 9E-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 3,880.5 kPa.

Test Summary Sheet

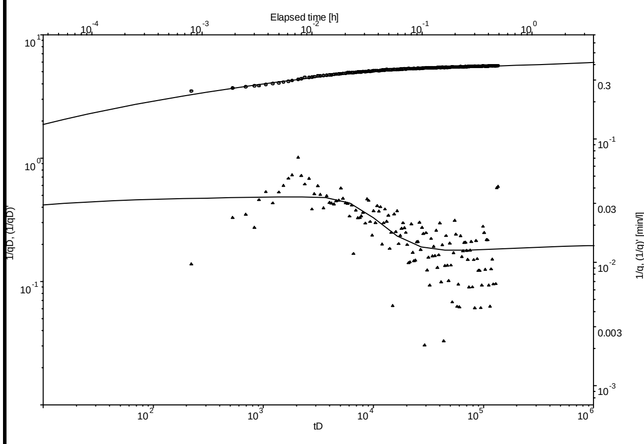
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060816 07:34
Test section from - to (m):	504.00-604.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

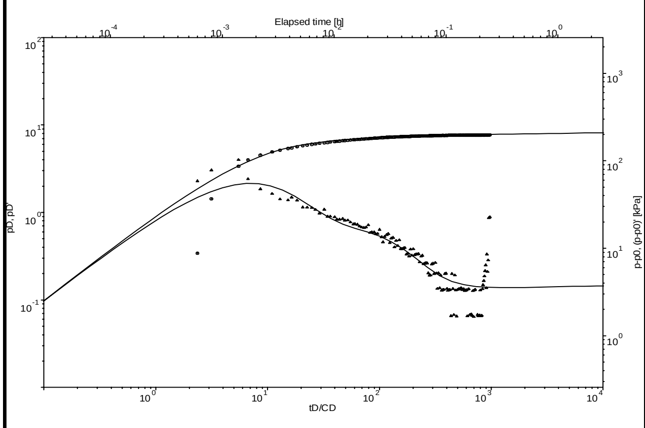


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5886		
p_i (kPa) =	5864		
p_p(kPa) =	6065	p_F (kPa) =	5867
Q_p (m^3/s)=	4.25E-05		
tp (s) =	1800	t_F (s) =	1800
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16.0		
Derivative fact.=	0.05	Derivative fact.=	0.06
Results		**Results**	
Q/s (m^2/s)=	2.1E-06		
T_M (m^2/s)=	2.7E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.18	dt_1 (min) =	0.33
dt_2 (min) =	1.20	dt_2 (min) =	1.80
T (m^2/s) =	1.9E-06	T (m^2/s) =	2.7E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.9E-08	K_s (m/s) =	2.7E-08
S_s (1/m) =	1.0E-08	S_s (1/m) =	1.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.6E-09
C_D (-) =	NA	C_D (-) =	1.7E-01
ξ (-) =	-1.41	ξ (-) =	0.89
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) =	1.6E-09
dt_2 (min) =	1.80	C_D (-) =	1.7E-01
T_T (m^2/s) =	2.7E-06	ξ (-) =	0.89
S (-) =	1.0E-06		
K_s (m/s) =	5.4E-07		
S_s (1/m) =	2.0E-07		

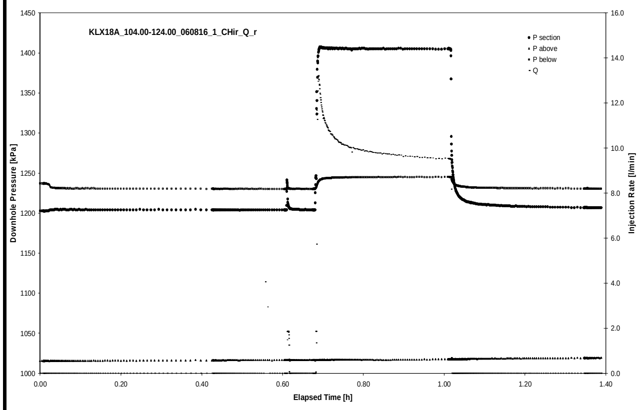
Comments:

The recommended transmissivity of 2.7E-6 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 9E-7 m2/s to 5E-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 5,864.1 kPa.

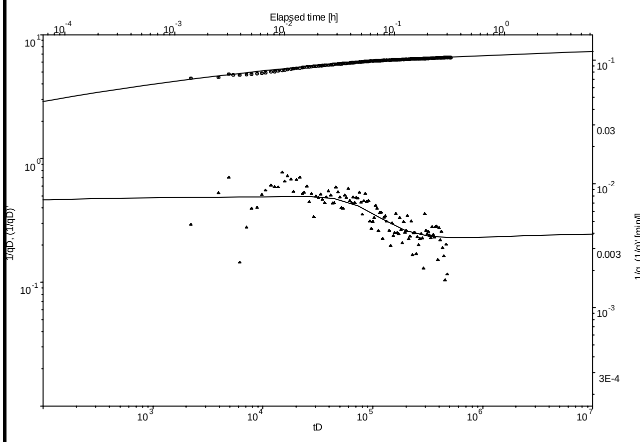
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060816 19:58
Test section from - to (m):	104.00-124.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

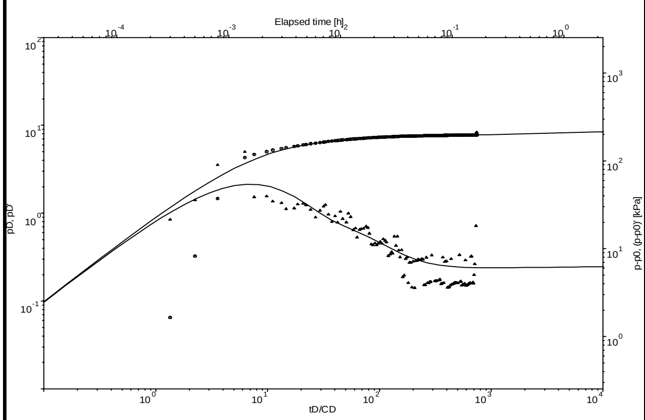
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	1202		
p_i (kPa) =	1204		
p_p(kPa) =	1404	p_F (kPa) =	1206
Q_p (m^3/s)=	1.58E-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)=	8.6		
Derivative fact.=	0.05	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	7.7E-06		
T_M (m^2/s)=	8.1E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.36	dt_1 (min) =	0.30
dt_2 (min) =	2.10	dt_2 (min) =	1.50
T (m^2/s) =	8.1E-06	T (m^2/s) =	1.0E-05
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	4.1E-07	K_s (m/s) =	5.2E-07
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.3E-09
C_D (-) =	NA	C_D (-) =	5.8E-01
ξ (-) =	-1.27	ξ (-) =	0.28
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) =	0.36	C (m^3/Pa) =	5.3E-09
dt_2 (min) =	2.10	C_D (-) =	5.8E-01
T_T (m^2/s) =	8.1E-06	ξ (-) =	-1.27
S (-) =	1.0E-06		
K_s (m/s) =	1.6E-06		
S_s (1/m) =	2.0E-07		

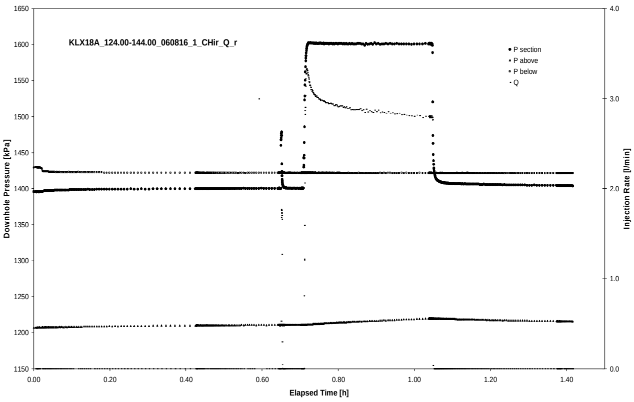
Comments:

The recommended transmissivity of 8.1E-6 m2/s was derived from the analysis of the CHi phase (inner zone), which shows the best derivative stabilization. The confidence range for the interval transmissivity is estimated to be 6E-6 m2/s to 2E-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 1,203.3 kPa.

Test Summary Sheet

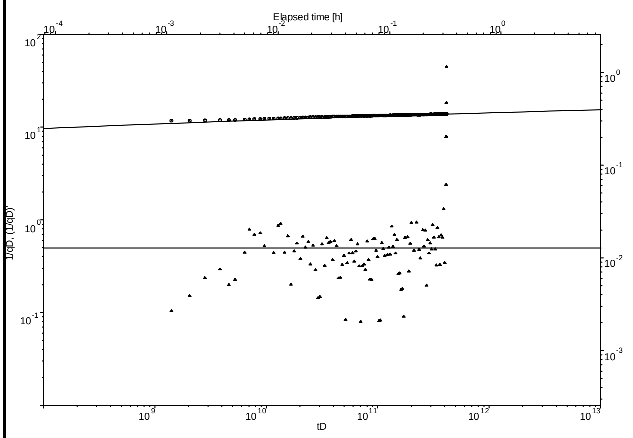
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060816 22:02
Test section from - to (m):	124.00-144.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

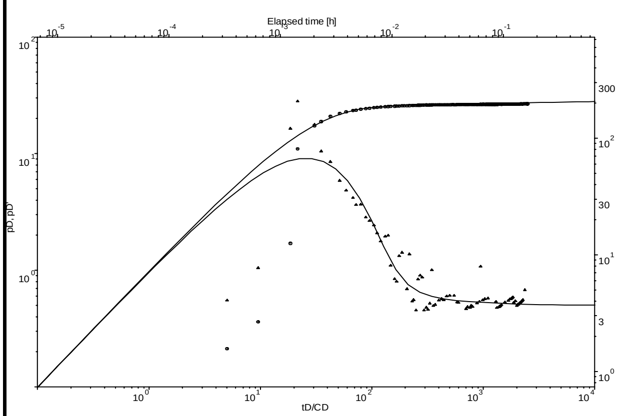


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	1395		
p_i (kPa) =	1400		
p_p(kPa) =	1601	p_F (kPa) =	1404
Q_p (m^3/s)=	4.65E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	8.8		
Derivative fact.=	0.04	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.3E-06		
T_M (m^2/s)=	2.4E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.33	dt_1 (min) =	0.90
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	5.1E-06	T (m^2/s) =	1.0E-05
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.5E-07	K_s (m/s) =	5.1E-07
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.6E-09
C_D (-) =	NA	C_D (-) =	1.7E-01
ξ (-) =	5.76	ξ (-) =	2.00
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) =	1.6E-09
dt_2 (min) =	18.00	C_D (-) =	1.7E-01
T_T (m^2/s) =	5.1E-06	ξ (-) =	5.76
S (-) =	1.0E-06		
K_s (m/s) =	1.0E-06		
S_s (1/m) =	2.0E-07		

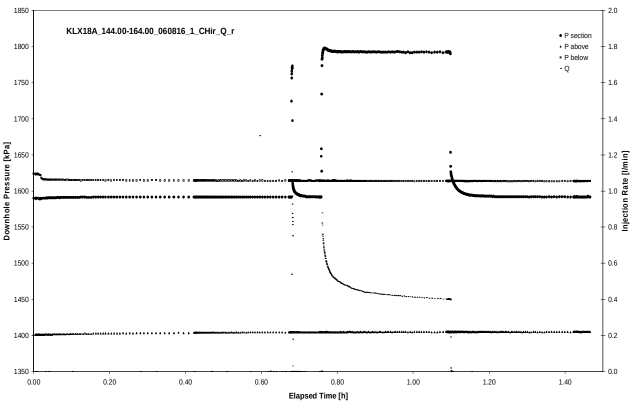
Comments:

The recommended transmissivity of 5.1E-6 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 2E-6 m2/s to 8E-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 1,402.9 kPa.

Test Summary Sheet

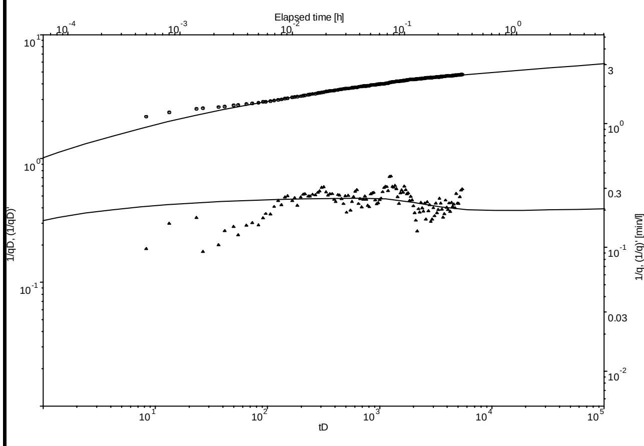
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060816 23:59
Test section from - to (m):	144.00-164.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

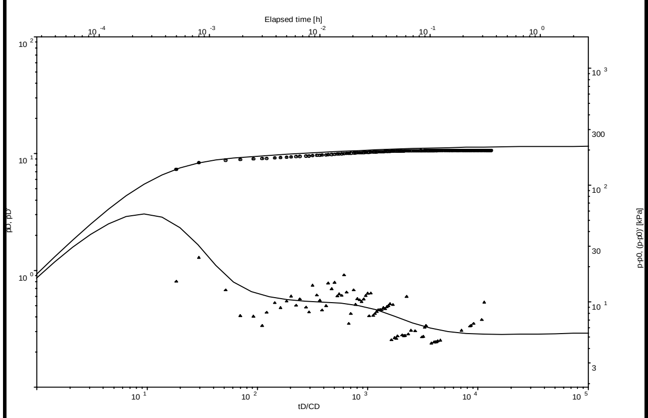


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	1590		
p_i (kPa) =	1592		
p_p(kPa) =	1792	p_F (kPa) =	1592
Q_p (m^3/s)=	6.63E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	9.1		
Derivative fact.=	0.05	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	3.3E-07		
T_M (m^2/s)=	3.4E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.39	dt_1 (min) =	0.15
dt_2 (min) =	5.40	dt_2 (min) =	2.10
T (m^2/s) =	2.5E-07	T (m^2/s) =	6.3E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.2E-08	K_s (m/s) =	3.1E-08
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.9E-11
C_D (-) =	NA	C_D (-) =	4.3E-03
ξ (-) =	-1.81	ξ (-) =	5.03
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) =	0.39	C (m^3/Pa) =	3.9E-11
dt_2 (min) =	5.40	C_D (-) =	4.3E-03
T_T (m^2/s) =	2.5E-07	ξ (-) =	-1.81
S (-) =	1.0E-06		
K_s (m/s) =	5.0E-08		
S_s (1/m) =	2.0E-07		

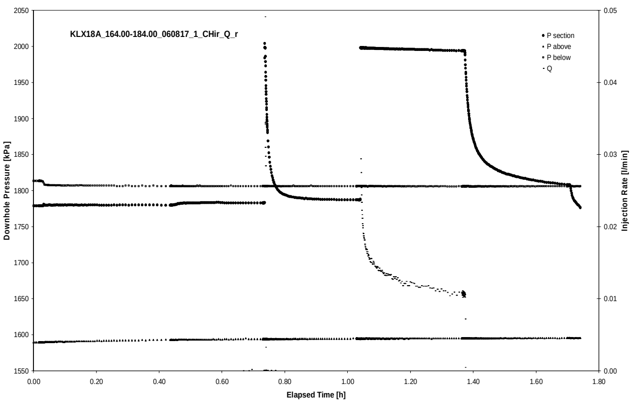
Comments:

The recommended transmissivity of 2.5E-7 m2/s was derived from the analysis of the CHi phase (inner zone), which shows the best derivative stabilization. The confidence range for the interval transmissivity is estimated to be 9E-8 m2/s to 5E-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 1,590.5 kPa.

Test Summary Sheet

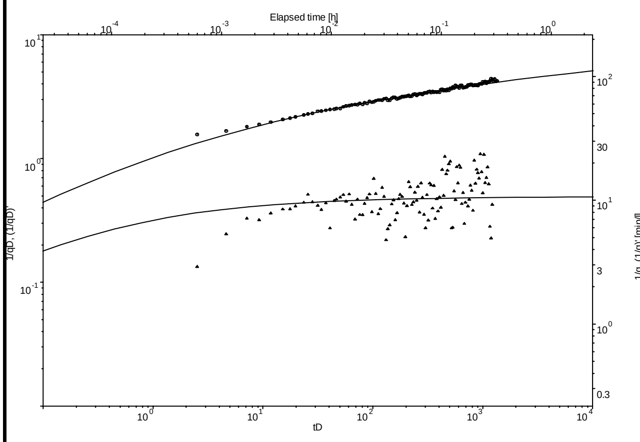
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060817 06:38
Test section from - to (m):	164.00-184.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

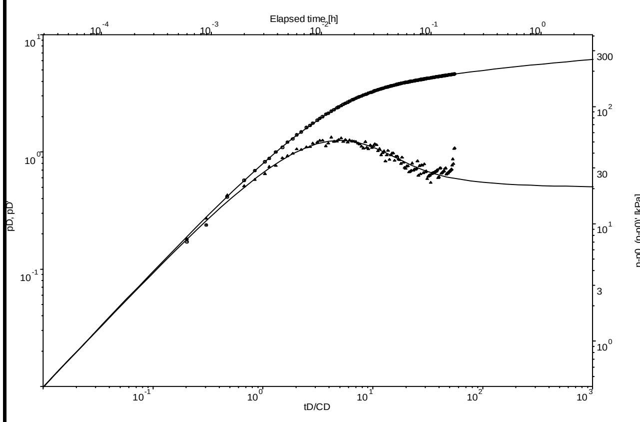


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	1779		
p_i (kPa) =	1788		
p_p(kPa) =	1994	p_F (kPa) =	1807
Q_p (m^3/s)=	1.83E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	9.4		
Derivative fact.=	0.09	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	8.7E-09		
T_M (m^2/s)=	9.1E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.24	dt_1 (min) =	1.80
dt_2 (min) =	12.00	dt_2 (min) =	9.00
T (m^2/s) =	5.8E-09	T (m^2/s) =	8.2E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.9E-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) =	5.6E-11
C_D (-) =	NA	C_D (-) =	6.1E-03
ξ (-) =	-0.62	ξ (-) =	0.25
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) =	1.80	C (m^3/Pa) =	5.6E-11
dt_2 (min) =	9.00	C_D (-) =	6.1E-03
T_T (m^2/s) =	8.2E-09	ξ (-) =	0.25
S (-) =	1.0E-06		
K_s (m/s) =	1.6E-09		
S_s (1/m) =	2.0E-07		

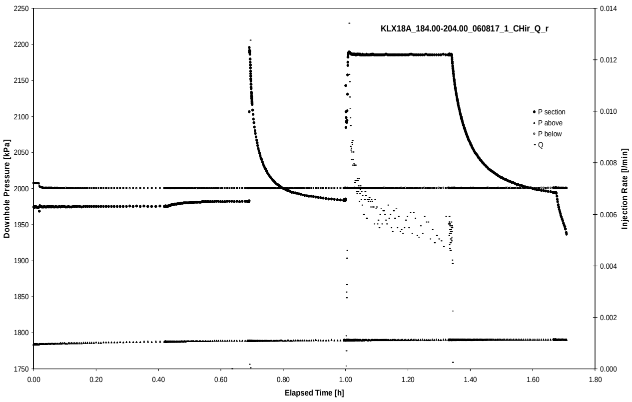
Comments:

The recommended transmissivity of 8.2E-9 m2/s was derived from the analysis of the CHir phase, because of its better data quality. The confidence range for the interval transmissivity is estimated to be 5E-9 m2/s to 1E-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 1,792.0 kPa.

Test Summary Sheet

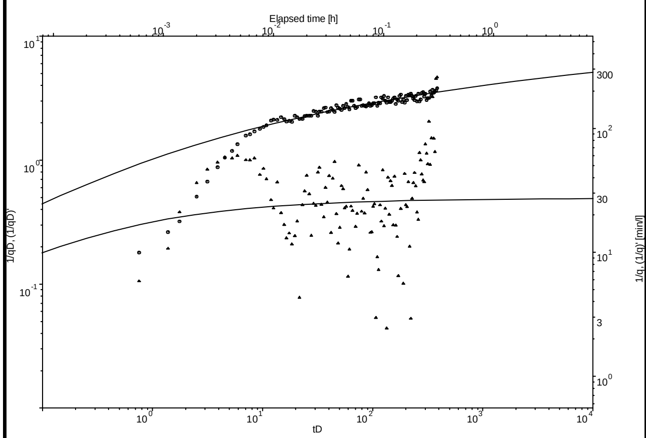
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060817 09:06
Test section from - to (m):	184.00-204.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

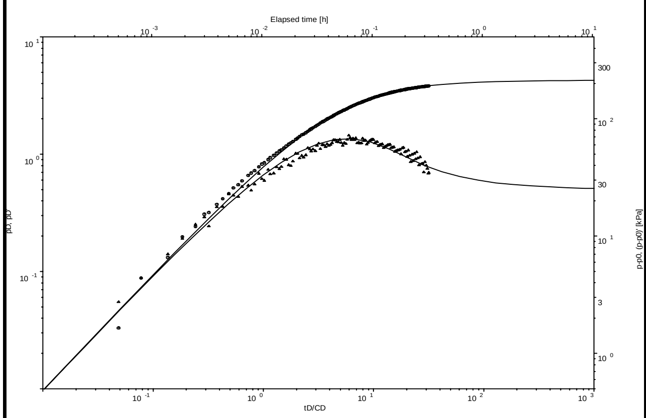


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	1975		
p_i (kPa) =	1984		
p_p(kPa) =	2186	p_F (kPa) =	1993
Q_p (m^3/s)=	8.27E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	9.7		
Derivative fact.=	0.15	Derivative fact.=	0.02
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) =	0.54	dt_1 (min) =	5.40
dt_2 (min) =	12.00	dt_2 (min) =	12.00
T (m^2/s) =	2.3E-09	T (m^2/s) =	3.4E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.2E-10	K_s (m/s) =	1.7E-10
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	8.2E-11
C_D (-) =	NA	C_D (-) =	9.0E-03
ξ (-) =	-0.76	ξ (-) =	2.00
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) =	5.40	C (m^3/Pa) =	8.2E-11
dt_2 (min) =	12.00	C_D (-) =	9.0E-03
T_T (m^2/s) =	3.4E-09	ξ (-) =	2.00
S (-) =	1.0E-06		
K_s (m/s) =	6.9E-10		
S_s (1/m) =	2.0E-07		

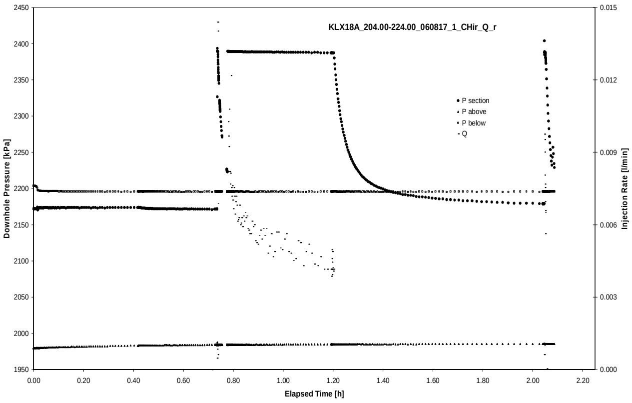
Comments:

The recommended transmissivity of 3.4E-9 m2/s was derived from the analysis of the CHir phase, because of its better data quality. The confidence range for the interval transmissivity is estimated to be 1E-9 m2/s to 6E-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 1,963.3 kPa.

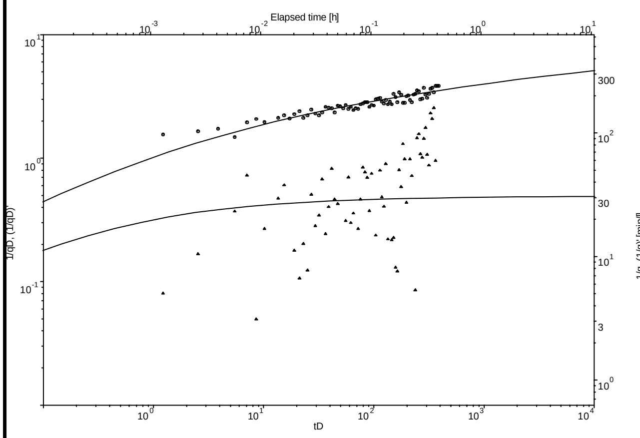
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060817 11:27
Test section from - to (m):	204.00-224.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

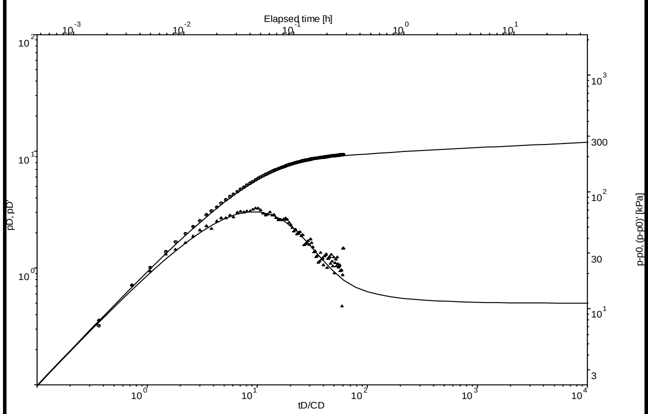
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2172		
p_i (kPa) =	2172		
p_p(kPa) =	2387	p_F (kPa) =	2179
Q_p (m^3/s)=	7.00E-08		
tp (s) =	1500	t_F (s) =	3060
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	10		
Derivative fact.=	0.12	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	3.2E-09		
T_M (m^2/s)=	3.3E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.90	dt_1 (min) =	5.40
dt_2 (min) =	12.00	dt_2 (min) =	15.00
T (m^2/s) =	1.9E-09	T (m^2/s) =	6.4E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	9.7E-11	K_s (m/s) =	3.2E-10
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.8E-11
C_D (-) =	NA	C_D (-) =	7.5E-03
ξ (-) =	-0.82	ξ (-) =	4.76
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) =	5.40	C (m^3/Pa) =	6.8E-11
dt_2 (min) =	15.00	C_D (-) =	7.5E-03
T_T (m^2/s) =	6.4E-09	ξ (-) =	4.76
S (-) =	1.0E-06		
K_s (m/s) =	1.3E-09		
S_s (1/m) =	2.0E-07		

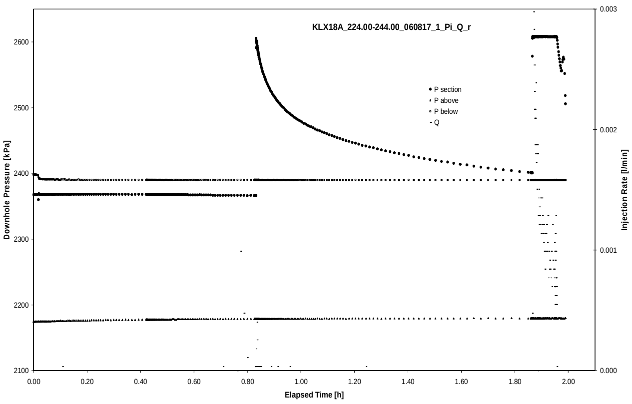
Comments:

The recommended transmissivity of 6.4E-9 m2/s was derived from the analysis of the CHir phase, because of its better data quality. The confidence range for the interval transmissivity is estimated to be 2E-9 m2/s to 9E-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 2,168.7 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060817 14:08
Test section from - to (m):	224.00-244.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

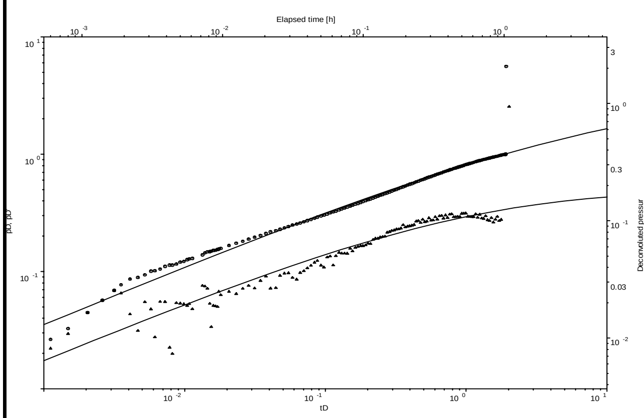
Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2367		
p_i (kPa) =	2366		
p_p(kPa) =	2605	p_F (kPa) =	2401
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	3720
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	10.4		
Derivative fact.=	NA	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	0.54
dt_2 (min) =	NA	dt_2 (min) =	33.00
T (m^2/s) =	NA	T (m^2/s) =	9.3E-11
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	4.6E-12
S_s (1/m) =	NA	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	7.9E-11
C_D (-) =	NA	C_D (-) =	8.7E-03
ξ (-) =	NA	ξ (-) =	-2.41
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) =	0.54	C (m^3/Pa) =	7.9E-11
dt_2 (min) =	33.00	C_D (-) =	8.7E-03
T_T (m^2/s) =	9.3E-11	ξ (-) =	-2.41
S (-) =	1.0E-06		
K_s (m/s) =	1.9E-11		
S_s (1/m) =	2.0E-07		

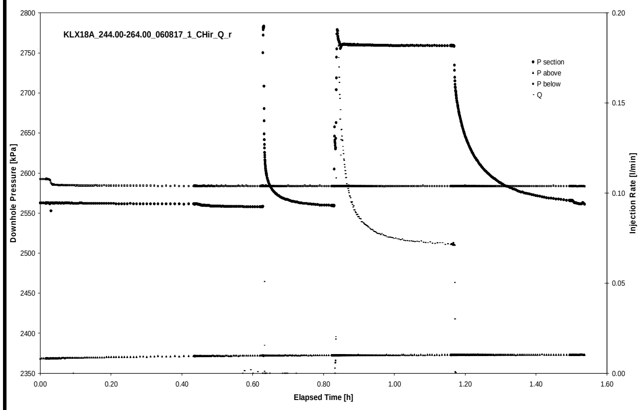
Comments:

The recommended transmissivity of 9.3E-11 m2/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 6E-11 to 2E-10 m2/s. The static pressure could not be extrapolated due to the very low transmissivity.

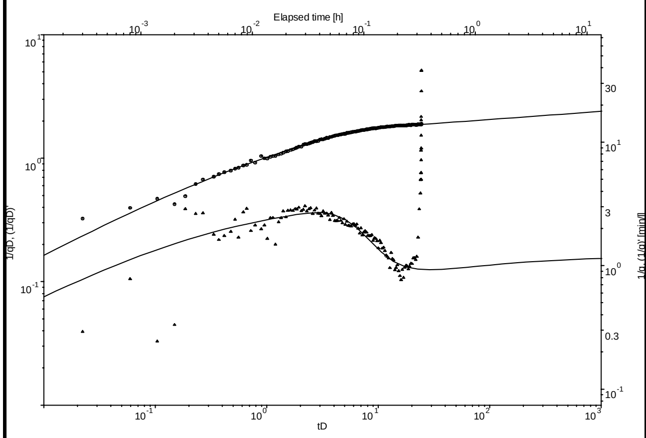
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060817 16:43
Test section from - to (m):	244.00-264.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

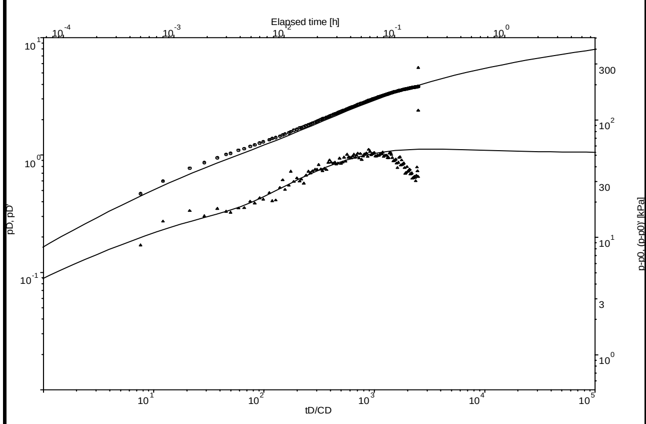
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2562		
p_i (kPa) =	2559		
p_p(kPa) =	2758	p_F (kPa) =	2565
Q_p (m^3/s)=	1.17E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	10.7		
Derivative fact.=	0.13	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	5.8E-08		
T_M (m^2/s)=	6.0E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.28	dt_1 (min) =	0.12
dt_2 (min) =	2.40	dt_2 (min) =	1.80
T (m^2/s) =	1.8E-08	T (m^2/s) =	4.3E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	8.8E-10	K_s (m/s) =	2.2E-09
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.6E-12
C_D (-) =	NA	C_D (-) =	7.3E-04
ξ (-) =	-3.19	ξ (-) =	-2.69
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) =	0.28	C (m^3/Pa) =	6.6E-12
dt_2 (min) =	2.40	C_D (-) =	7.3E-04
T_T (m^2/s) =	1.8E-08	ξ (-) =	-3.19
S (-) =	1.0E-06		
K_s (m/s) =	3.5E-09		
S_s (1/m) =	2.0E-07		

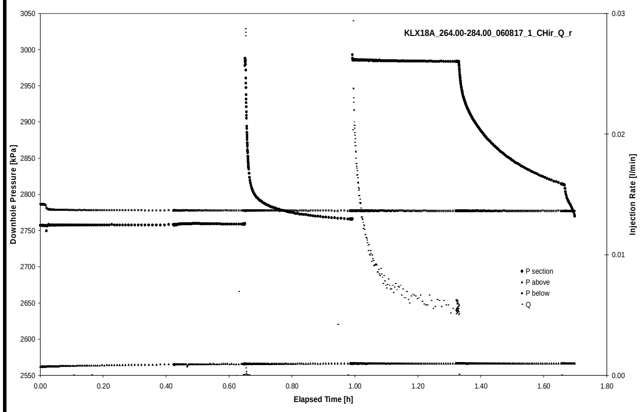
Comments:

The recommended transmissivity of 1.8E-8 m2/s was derived from the analysis of the CHi phase (inner zone), which shows the better derivative stabilization. The confidence range for the interval transmissivity is estimated to be 9E-9 m2/s to 6E-8 m2/s (this range encompasses the inner zone transmissivity of the CHir phase). 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 2,543.4 kPa.

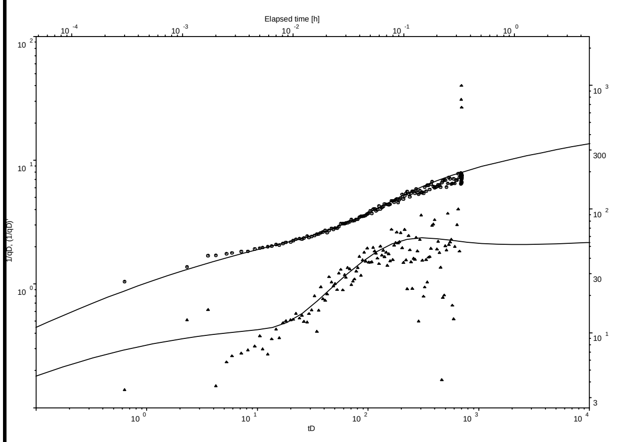
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060817 18:46
Test section from - to (m):	264.00-284.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

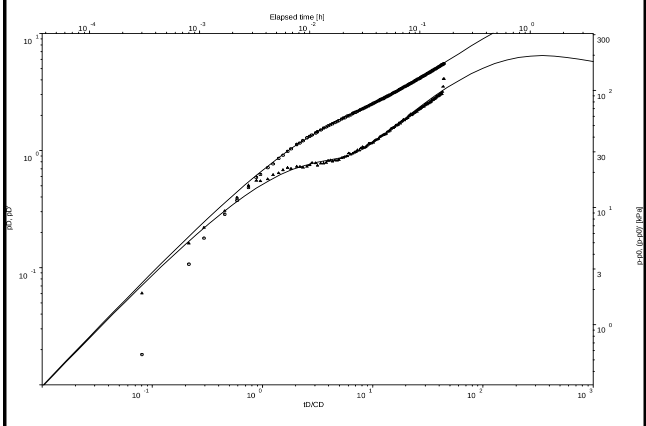
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2756		
p_i (kPa) =	2766		
p_p(kPa) =	2983	p_F (kPa) =	2813
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)=	11		
Derivative fact.=	0.09	Derivative fact.=	0.1
Results		**Results**	
Q/s (m^2/s)=	4.5E-09		
T_M (m^2/s)=	4.7E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.18	dt_1 (min) =	0.24
dt_2 (min) =	0.90	dt_2 (min) =	1.20
T (m^2/s) =	4.9E-09	T (m^2/s) =	6.9E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.4E-10	K_s (m/s) =	3.4E-10
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.0E-11
C_D (-) =	NA	C_D (-) =	6.7E-03
ξ (-) =	-0.89	ξ (-) =	-0.92
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) =	0.24	C (m^3/Pa) =	6.0E-11
dt_2 (min) =	1.20	C_D (-) =	6.7E-03
T_T (m^2/s) =	6.9E-09	ξ (-) =	-0.92
S (-) =	1.0E-06		
K_s (m/s) =	1.4E-09		
S_s (1/m) =	2.0E-07		

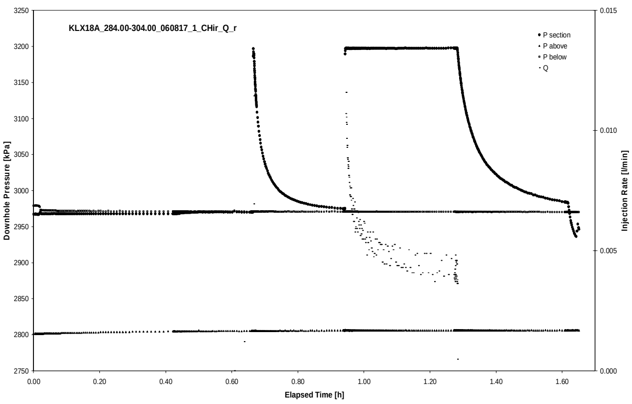
Comments:

The recommended transmissivity of 6.9E-9 m2/s was derived from the analysis of the CHir phase (inner zone), because of its better data quality. The confidence range for the interval transmissivity is estimated to be 3E-9 m2/s to 9E-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 2,750.4 kPa.

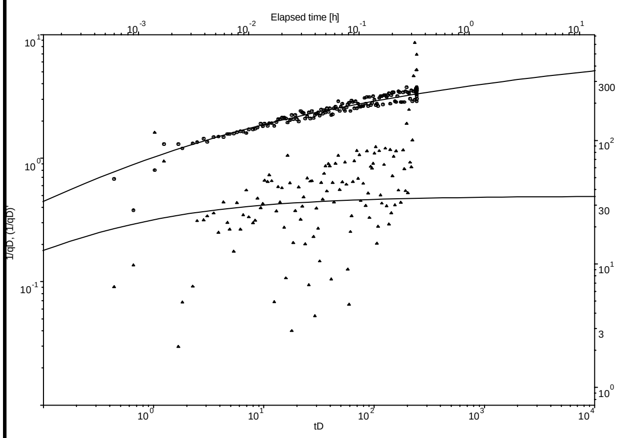
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060817 21:22
Test section from - to (m):	284.00-304.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

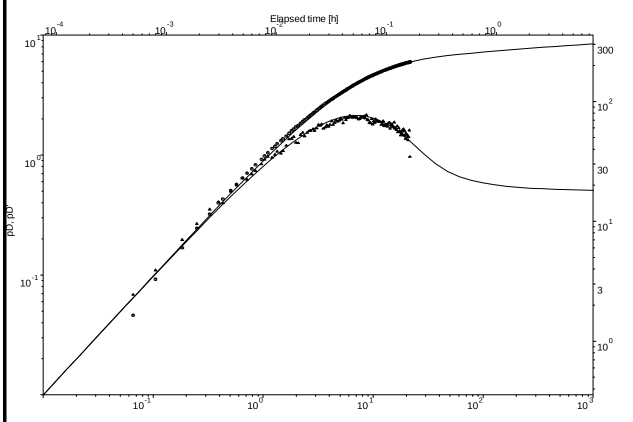
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2967		
p_i (kPa) =	2974		
p_p(kPa) =	3197	p_F (kPa) =	2982
Q_p (m^3/s)=	6.67E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.3		
Derivative fact.=	0.11	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.9E-09		
T_M (m^2/s)=	3.1E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.24	dt_1 (min) =	1.50
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	1.6E-09	T (m^2/s) =	3.7E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	8.1E-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) =	6.4E-11
C_D (-) =	NA	C_D (-) =	7.0E-03
ξ (-) =	-0.86	ξ (-) =	2.49
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) =	1.50	C (m^3/Pa) =	6.4E-11
dt_2 (min) =	9.00	C_D (-) =	7.0E-03
T_T (m^2/s) =	3.7E-09	ξ (-) =	2.49
S (-) =	1.0E-06		
K_s (m/s) =	7.3E-10		
S_s (1/m) =	2.0E-07		

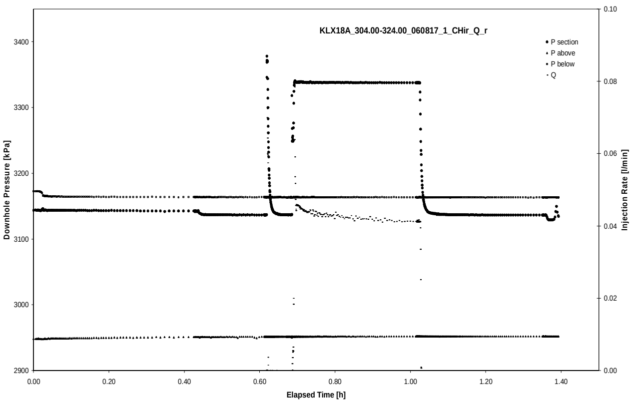
Comments:

The recommended transmissivity of 3.7E-9 m2/s was derived from the analysis of the CHir phase, because of its better data quality. The confidence range for the interval transmissivity is estimated to be 9E-10 m2/s to 6E-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 2,938.4 kPa.

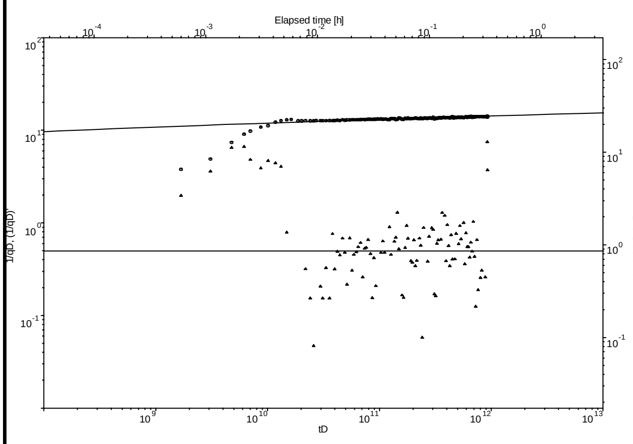
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060817 23:30
Test section from - to (m):	304.00-324.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

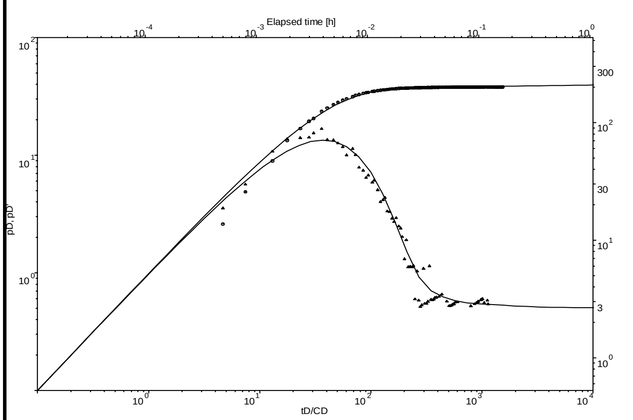
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3144		
p_i (kPa) =	3137		
p_p(kPa) =	3337	p_F (kPa) =	3136
Q_p (m^3/s)=	6.67E-07		
tp (s) =	1200	t_F (s) =	1200
S el S* (-)=	1.00E-06	S el S* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.6		
Derivative fact.=	0.08	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	3.3E-08		
T_M (m^2/s)=	3.4E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.84	dt_1 (min) =	1.20
dt_2 (min) =	15.60	dt_2 (min) =	7.20
T (m^2/s) =	7.5E-08	T (m^2/s) =	2.1E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.8E-09	K_s (m/s) =	1.1E-08
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.2E-11
C_D (-) =	NA	C_D (-) =	5.8E-03
ξ (-) =	8.26	ξ (-) =	32.50
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) =	1.20	C (m^3/Pa) =	5.2E-11
dt_2 (min) =	7.20	C_D (-) =	5.8E-03
T_T (m^2/s) =	2.1E-07	ξ (-) =	32.50
S (-) =	1.0E-06		
K_s (m/s) =	4.2E-08		
S_s (1/m) =	2.0E-07		

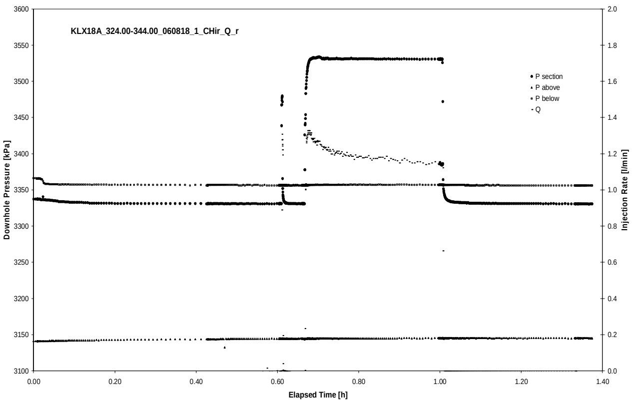
Comments:

The recommended transmissivity of 2.1E-7 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 8E-8 m2/s to 5E-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 3,135.0 kPa.

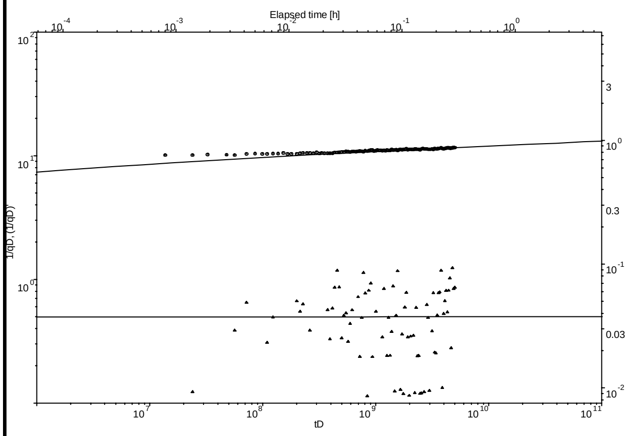
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060818 01:24
Test section from - to (m):	324.00-344.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

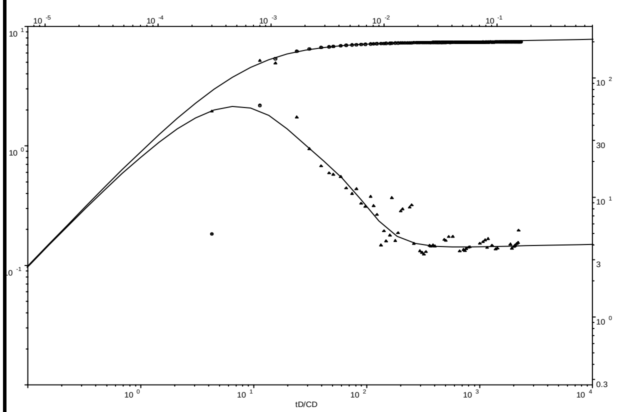
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3337		
p_i (kPa) =	3331		
p_p(kPa) =	3531	p_F (kPa) =	3331
Q_p (m^3/s)=	1.90E-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)=	11.9		
Derivative fact.=	0.06	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	9.3E-07		
T_M (m^2/s)=	9.7E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.42	dt_1 (min) =	0.60
dt_2 (min) =	15.00	dt_2 (min) =	9.00
T (m^2/s) =	1.7E-06	T (m^2/s) =	5.7E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	8.7E-08	K_s (m/s) =	2.9E-07
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.9E-10
C_D (-) =	NA	C_D (-) =	2.1E-02
ξ (-) =	4.14	ξ (-) =	1.95
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) =	0.60	C (m^3/Pa) =	1.9E-10
dt_2 (min) =	9.00	C_D (-) =	2.1E-02
T_T (m^2/s) =	5.7E-06	ξ (-) =	1.95
S (-) =	1.0E-06		
K_s (m/s) =	1.1E-06		
S_s (1/m) =	2.0E-07		

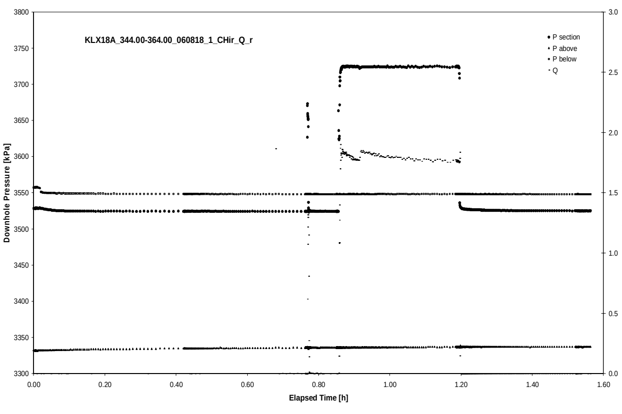
Comments:

The recommended transmissivity of 5.7E-6 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the best derivative stabilization. The confidence range for the interval transmissivity is estimated to be 2E-6 m2/s to 9E-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 3,330.2 kPa.

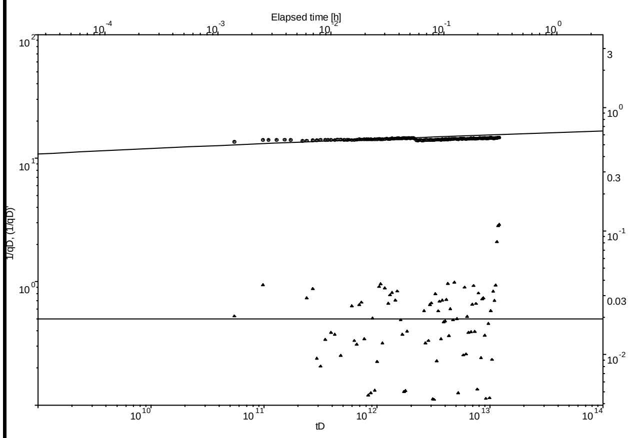
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060818 06:29
Test section from - to (m):	344.00-364.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

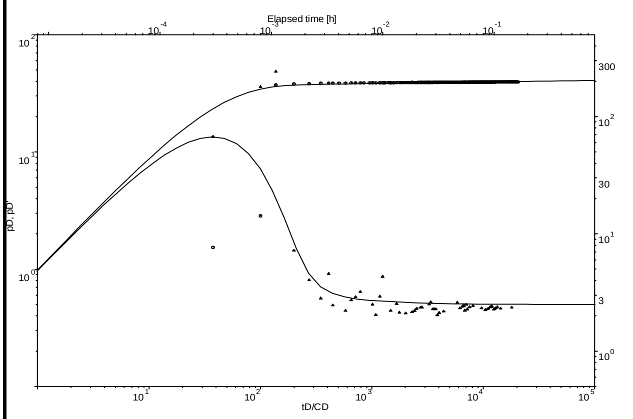
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3529		
p_i (kPa) =	3524		
p_p(kPa) =	3724	p_F (kPa) =	3525
Q_p (m^3/s)=	2.93E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.2		
Derivative fact.=	0.05	Derivative fact.=	0.04
Results		**Results**	
Q/s (m^2/s)=	1.4E-06		
T_M (m^2/s)=	1.5E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.42	dt_1 (min) =	0.15
dt_2 (min) =	15.00	dt_2 (min) =	9.00
T (m^2/s) =	3.4E-06	T (m^2/s) =	9.3E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.7E-07	K_s (m/s) =	4.7E-07
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.7E-10
C_D (-) =	NA	C_D (-) =	1.9E-02
ξ (-) =	7.68	ξ (-) =	31.90
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) =	0.15	C (m^3/Pa) =	1.7E-10
dt_2 (min) =	9.00	C_D (-) =	1.9E-02
T_T (m^2/s) =	9.3E-06	ξ (-) =	31.90
S (-) =	1.0E-06		
K_s (m/s) =	1.9E-06		
S_s (1/m) =	2.0E-07		

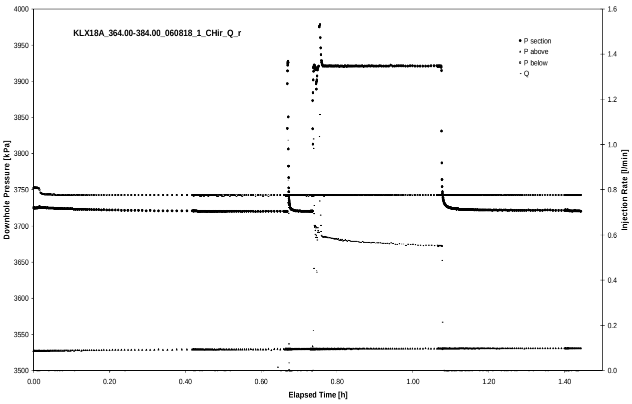
Comments:

The recommended transmissivity of 9.3E-6 m2/s was derived from the analysis of the CHir phase, which shows the slight better data and a horizontal stabilization of the derivative. The confidence range for the interval transmissivity is estimated to be 3E-6 m2/s to 3E-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 3,524.4 kPa.

Test Summary Sheet

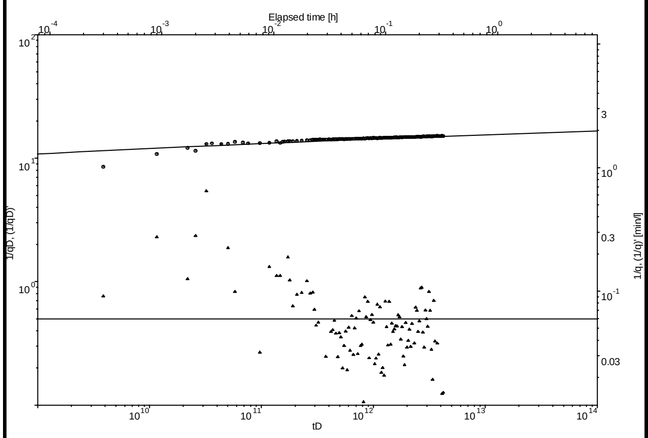
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060818 08:34
Test section from - to (m):	364.00-384.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

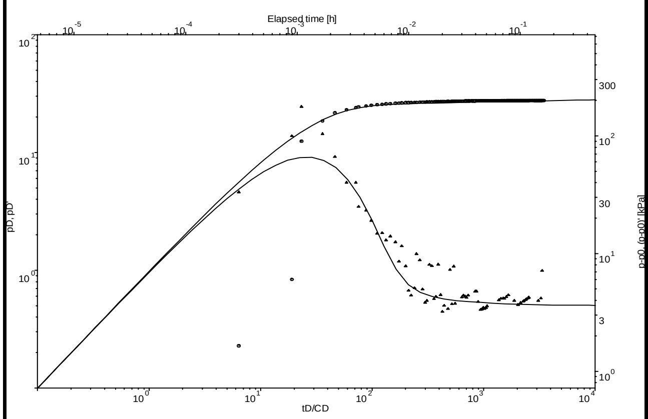


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3725		
p_i (kPa) =	3720		
p_p(kPa) =	3921	p_F (kPa) =	3721
Q_p (m^3/s)=	9.22E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.5		
Derivative fact.=	0.06	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	4.5E-07		
T_M (m^2/s)=	4.7E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.20	dt_1 (min) =	0.60
dt_2 (min) =	15.00	dt_2 (min) =	9.00
T (m^2/s) =	1.1E-06	T (m^2/s) =	2.1E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.5E-08	K_s (m/s) =	1.0E-07
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.2E-10
C_D (-) =	NA	C_D (-) =	2.5E-02
ξ (-) =	7.69	ξ (-) =	20.30
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) =	0.60	C (m^3/Pa) =	2.2E-10
dt_2 (min) =	9.00	C_D (-) =	2.5E-02
T_T (m^2/s) =	2.1E-06	ξ (-) =	20.30
S (-) =	1.0E-06		
K_s (m/s) =	4.1E-07		
S_s (1/m) =	2.0E-07		

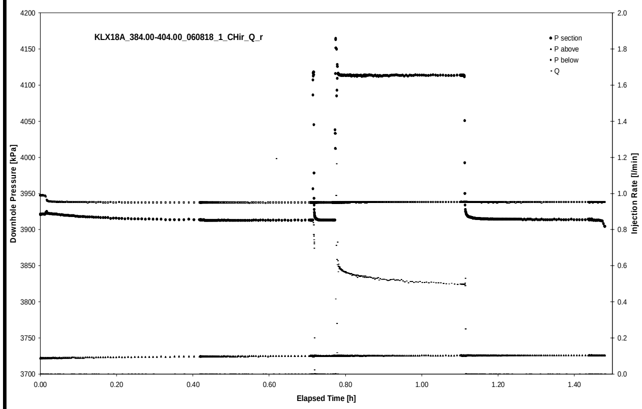
Comments:

The recommended transmissivity of 2.1E-6 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 9E-7 m2/s to 5E-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 3,720.6 kPa.

Test Summary Sheet

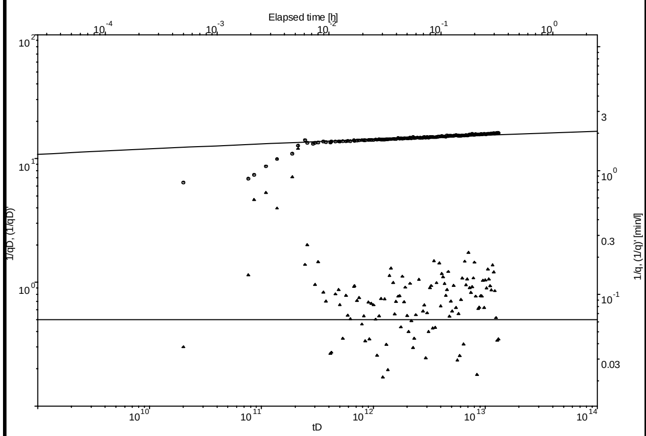
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060818 10:38
Test section from - to (m):	384.00-404.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

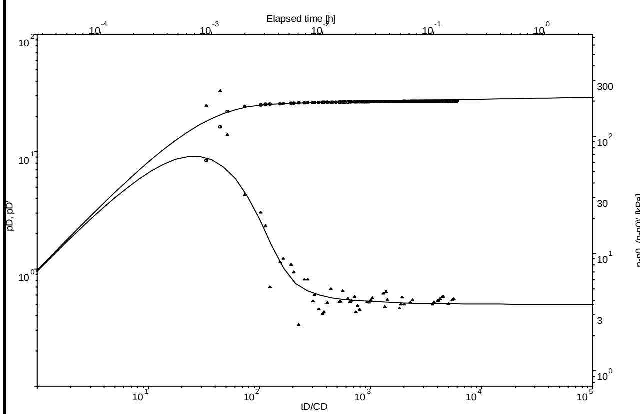


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3921		
p_i (kPa) =	3913		
p_p(kPa) =	4114	p_F (kPa) =	3914
Q_p (m^3/s)=	8.30E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.8		
Derivative fact.=	0.06	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	4.1E-07		
T_M (m^2/s)=	4.2E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.60	dt_1 (min) =	0.36
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	1.0E-06	T (m^2/s) =	1.9E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.2E-08	K_s (m/s) =	9.4E-08
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.2E-10
C_D (-) =	NA	C_D (-) =	1.3E-02
ξ (-) =	8.28	ξ (-) =	20.60
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) =	0.36	C (m^3/Pa) =	1.2E-10
dt_2 (min) =	9.00	C_D (-) =	1.3E-02
T_T (m^2/s) =	1.9E-06	ξ (-) =	20.60
S (-) =	1.0E-06		
K_s (m/s) =	3.7E-07		
S_s (1/m) =	2.0E-07		

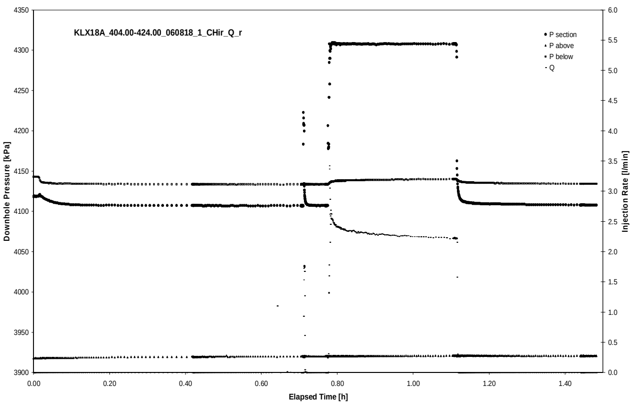
Comments:

The recommended transmissivity of 1.9E-6 m2/s was derived from the analysis of the CHir phase, which shows the slight better data and a horizontal stabilization of the derivative. The confidence range for the interval transmissivity is estimated to be 8E-7 m2/s to 4E-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 3,913.3 kPa.

Test Summary Sheet

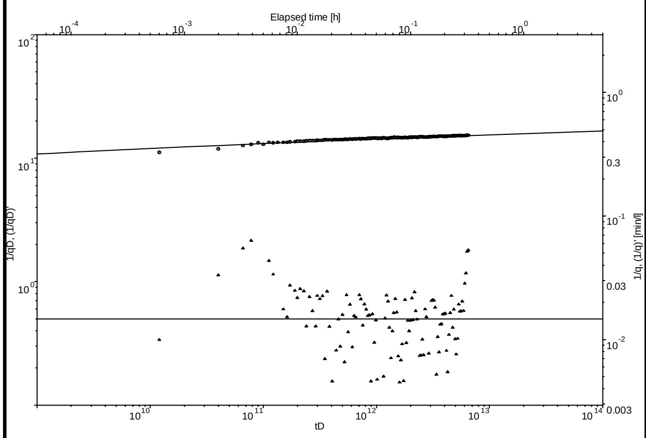
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060818 13:16
Test section from - to (m):	404.00-424.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

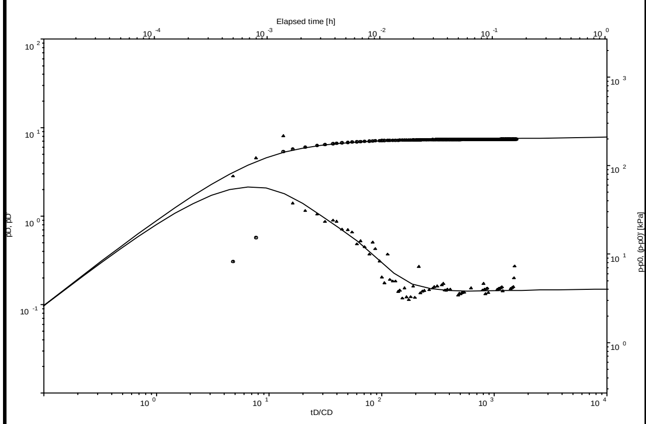


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4119		
p_i (kPa) =	4107		
p_p(kPa) =	4307	p_F (kPa) =	4108
Q_p (m^3/s)=	3.71E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.1		
Derivative fact.=	0.06	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.8E-06		
T_M (m^2/s)=	1.9E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.42	dt_1 (min) =	0.78
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	4.4E-06	T (m^2/s) =	7.3E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.2E-07	K_s (m/s) =	3.7E-07
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.4E-10
C_D (-) =	NA	C_D (-) =	5.9E-02
ξ (-) =	-0.85	ξ (-) =	1.24
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) =	0.78	C (m^3/Pa) =	5.4E-10
dt_2 (min) =	9.00	C_D (-) =	5.9E-02
T_T (m^2/s) =	7.3E-06	ξ (-) =	1.24
S (-) =	1.0E-06		
K_s (m/s) =	1.5E-06		
S_s (1/m) =	2.0E-07		

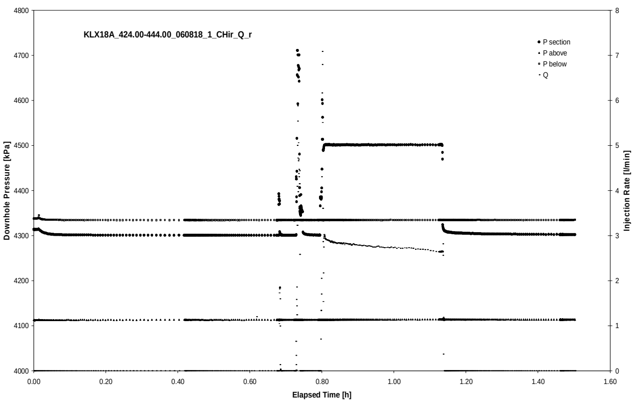
Comments:

The recommended transmissivity of 7.3E-6 m2/s was derived from the analysis of the CHir phase (outer zone), which shows the better derivative stabilization. The confidence range for the interval transmissivity is estimated to be 2E-6 m2/s to 1E-5 m2/s (this range includes the inner zone transmissivity of the CHir phase). 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 4,107.1 kPa.

Test Summary Sheet

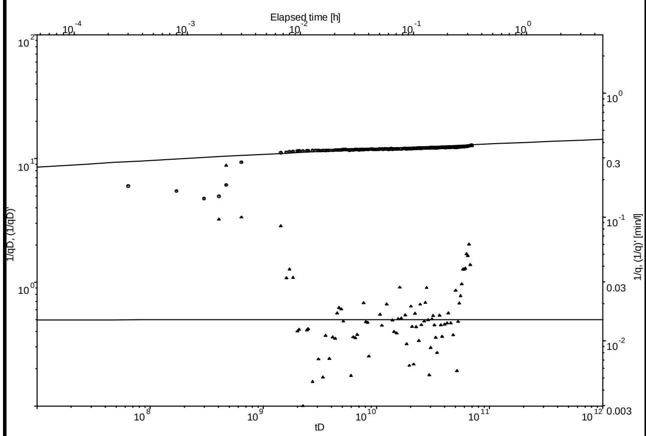
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060818 15:16
Test section from - to (m):	424.00-444.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

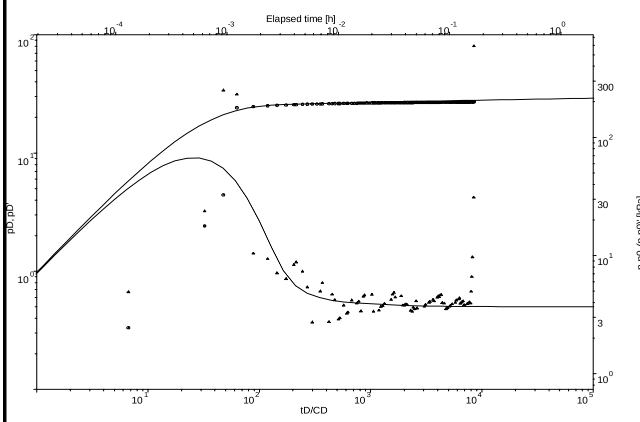


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4313		
p_i (kPa) =	4301		
p_p(kPa) =	4501	p_F (kPa) =	4302
Q_p (m^3/s)=	4.43E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.5		
Derivative fact.=	0.03	Derivative fact.=	0.02
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) =	0.60	dt_1 (min) =	0.30
dt_2 (min) =	15.00	dt_2 (min) =	9.00
T (m^2/s) =	4.4E-06	T (m^2/s) =	9.9E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.2E-07	K_s (m/s) =	4.9E-07
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	4.4E-10
C_D (-) =	NA	C_D (-) =	4.9E-02
ξ (-) =	4.94	ξ (-) =	19.90
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) =	0.30	C (m^3/Pa) =	4.4E-10
dt_2 (min) =	9.00	C_D (-) =	4.9E-02
T_T (m^2/s) =	9.9E-06	ξ (-) =	19.90
S (-) =	1.0E-06		
K_s (m/s) =	2.0E-06		
S_s (1/m) =	2.0E-07		

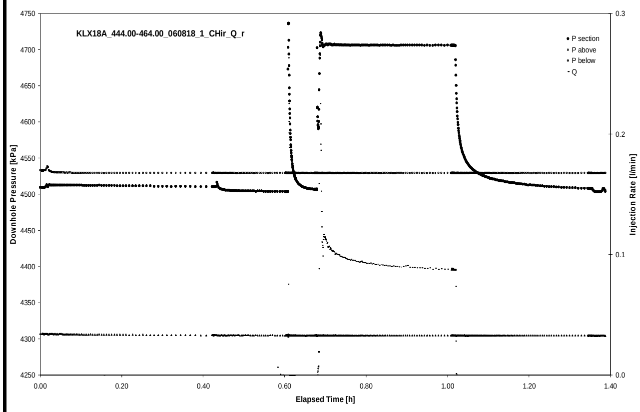
Comments:

The recommended transmissivity of 9.9E-6 m2/s was derived from the analysis of the CHir phase, which shows the better derivative stabilization. The confidence range for the interval transmissivity is estimated to be 4E-6 m2/s to 3E-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 4,300.9 kPa.

Test Summary Sheet

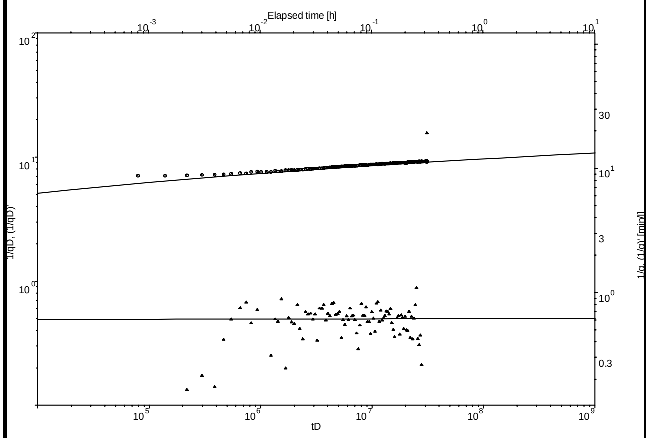
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060818 17:20
Test section from - to (m):	444.00-464.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

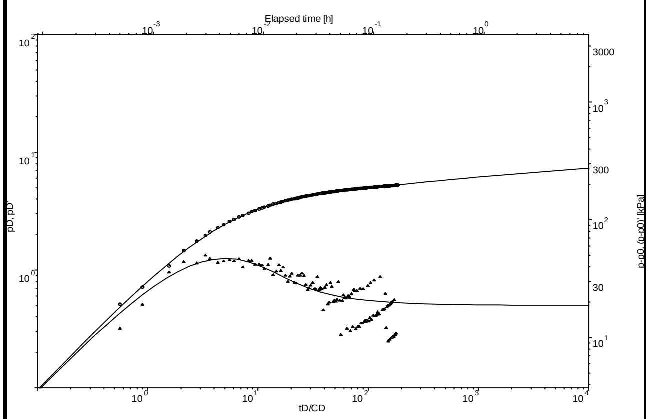


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4509		
p_i (kPa) =	4507		
p_p(kPa) =	4706	p_F (kPa) =	4507
Q_p (m^3/s)=	1.47E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.8		
Derivative fact.=	0.08	Derivative fact.=	0
Results		**Results**	
Q/s (m^2/s)=	7.2E-08		
T_M (m^2/s)=	7.6E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.36	dt_1 (min) =	1.50
dt_2 (min) =	18.00	dt_2 (min) =	7.20
T (m^2/s) =	1.1E-07	T (m^2/s) =	6.5E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.3E-09	K_s (m/s) =	3.2E-09
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 (-) =	1.5E-02
ξ (-) =	2.96	ξ (-) =	-0.18
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) =	1.50	C (m^3/Pa) =	1.3E-10
dt_2 (min) =	7.20	C_D (-) =	1.5E-02
T_T (m^2/s) =	6.5E-08	ξ (-) =	-0.18
S (-) =	1.0E-06		
K_s (m/s) =	1.3E-08		
S_s (1/m) =	2.0E-07		

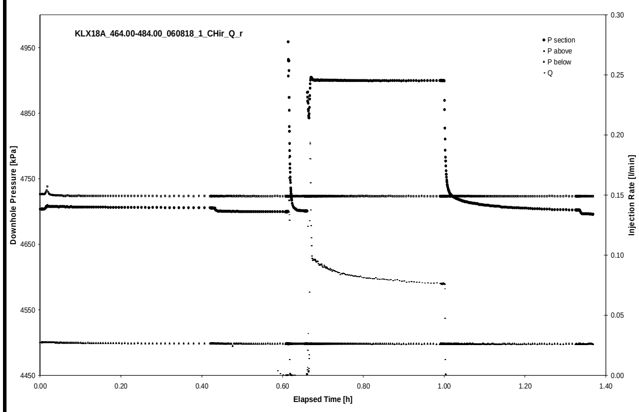
Comments:

The recommended transmissivity of 6.5E-8 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 3E-8 m2/s to 9E-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 4,494.7 kPa.

Test Summary Sheet

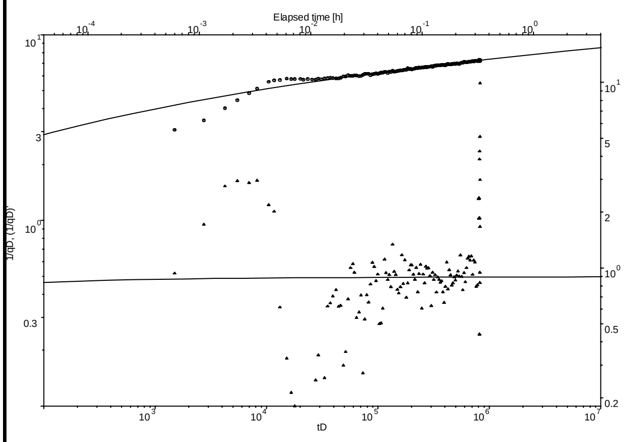
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060818 19:13
Test section from - to (m):	464.00-484.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

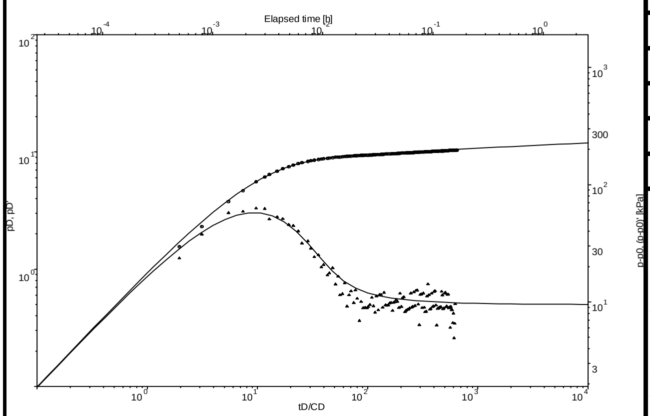


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4703		
p_i (kPa) =	4700		
p_p(kPa) =	4899	p_F (kPa) =	4701
Q_p (m^3/s)=	1.27E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.1		
Derivative fact.=	0.12	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	6.2E-08		
T_M (m^2/s)=	6.5E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.90	dt_1 (min) =	1.02
dt_2 (min) =	15.00	dt_2 (min) =	9.00
T (m^2/s) =	7.3E-08	T (m^2/s) =	1.1E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.6E-09	K_s (m/s) =	5.6E-09
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.6E-11
C_D (-) =	NA	C_D (-) =	7.3E-03
ξ (-) =	1.31	ξ (-) =	4.77
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) =	1.02	C (m^3/Pa) =	6.6E-11
dt_2 (min) =	9.00	C_D (-) =	7.3E-03
T_T (m^2/s) =	1.1E-07	ξ (-) =	4.77
S (-) =	1.0E-06		
K_s (m/s) =	2.2E-08		
S_s (1/m) =	2.0E-07		

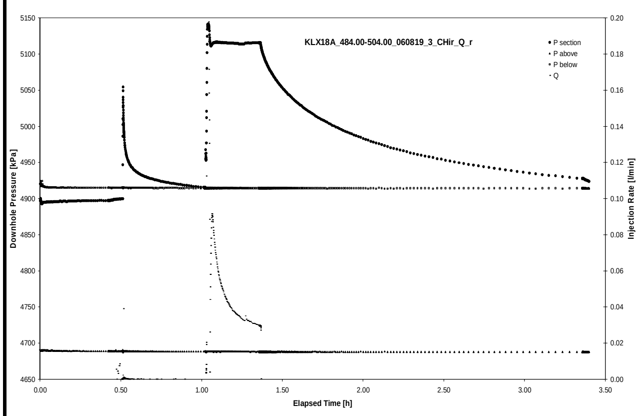
Comments:

The recommended transmissivity of 1.1E-7 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 7E-8 m2/s to 3E-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 4,695.3 kPa.

Test Summary Sheet

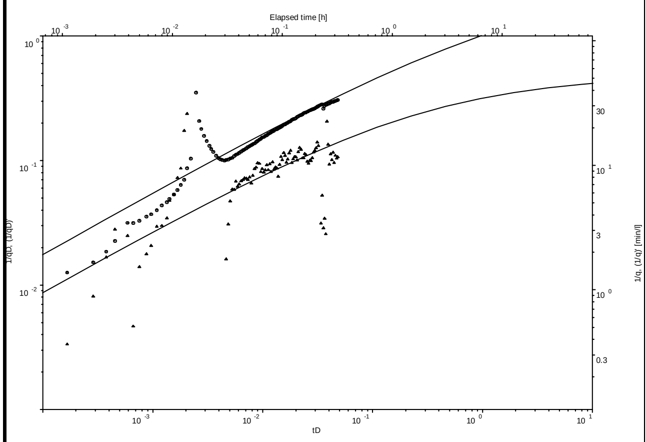
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	3
Borehole ID:	KLX18A	Test start:	060819 00:45
Test section from - to (m):	484.00-504.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

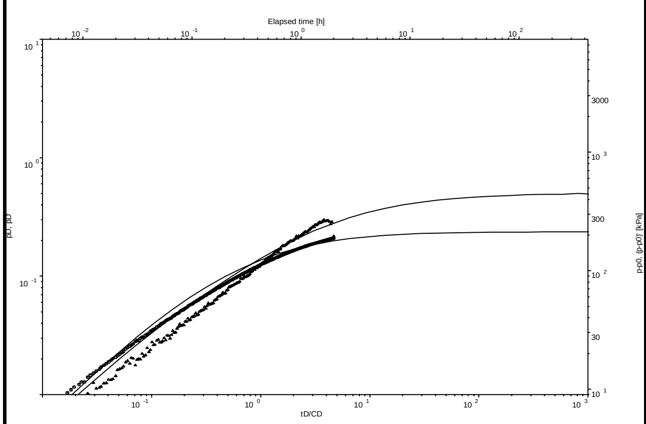


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4895		
p_i (kPa) =	4915		
p_p(kPa) =	5116	p_F (kPa) =	4927
Q_p (m^3/s)=	4.73E-07		
tp (s) =	1200	t_F (s) =	7200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.5		
Derivative fact.=	0.02	Derivative fact.=	0.07
Results		**Results**	
Q/s (m^2/s)=	2.3E-08		
T_M (m^2/s)=	2.4E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.92	dt_1 (min) =	33.00
dt_2 (min) =	15.00	dt_2 (min) =	108.00
T (m^2/s) =	1.2E-09	T (m^2/s) =	1.6E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	6.0E-11	K_s (m/s) =	8.1E-11
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.6E-09
C_D (-) =	NA	C_D (-) =	1.7E-01
ξ (-) =	-4.94	ξ (-) =	-4.32
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) =	33.00	C (m^3/Pa) =	1.6E-09
dt_2 (min) =	108.00	C_D (-) =	1.7E-01
T_T (m^2/s) =	1.6E-09	ξ (-) =	-4.32
S (-) =	1.0E-06		
K_s (m/s) =	3.2E-10		
S_s (1/m) =	2.0E-07		

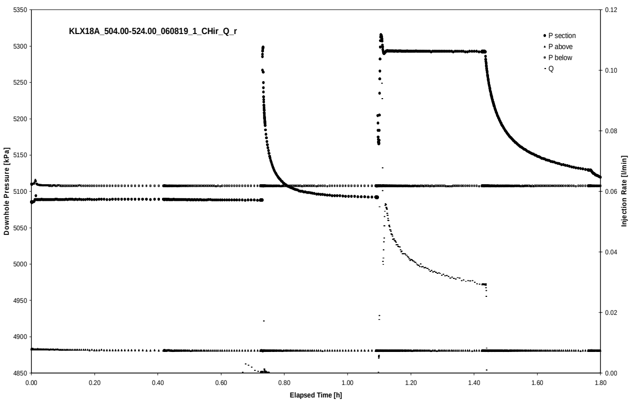
Comments:

The recommended transmissivity of 1.6E-9 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 9E-10 m2/s to 5E-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 4,895.4 kPa.

Test Summary Sheet

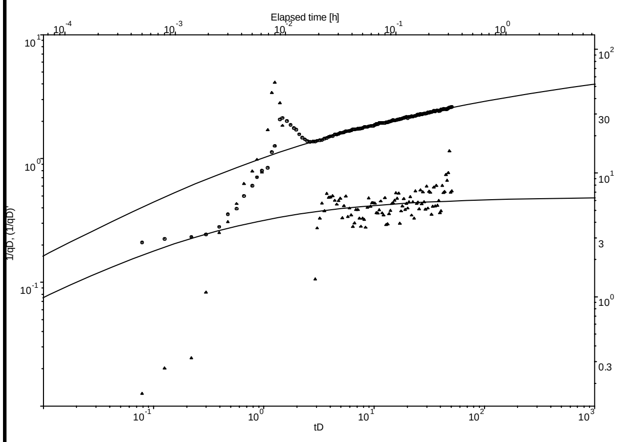
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060819 06:24
Test section from - to (m):	504.00-524.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5086		
p_i (kPa) =	5092		
p_p(kPa) =	5292	p_F (kPa) =	5127
Q_p (m^3/s)=	4.70E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.8		
Derivative fact.=	0.06	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.3E-08		
T_M (m^2/s)=	2.4E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.20	dt_1 (min) =	3.30
dt_2 (min) =	15.00	dt_2 (min) =	10.20
T (m^2/s) =	9.9E-09	T (m^2/s) =	1.7E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.0E-10	K_s (m/s) =	8.5E-10
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	4.8E-10
C_D (-) =	NA	C_D (-) =	5.2E-02
ξ (-) =	-2.35	ξ (-) =	-1.97
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

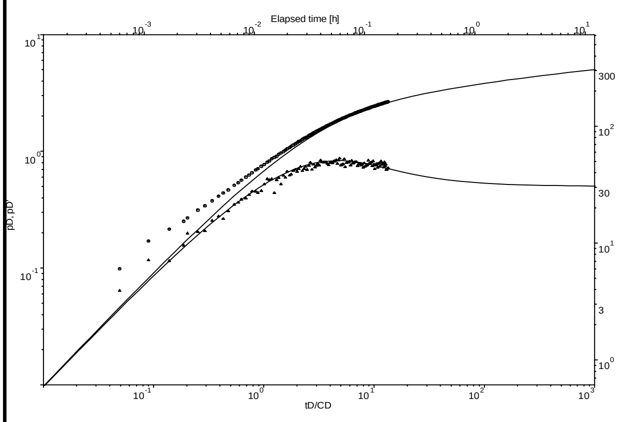
Log-Log plot incl. derivates- flow period



Selected representative parameters.

dt_1 (min) =	3.30	C (m^3/Pa) =	4.8E-10
dt_2 (min) =	10.20	C_D (-) =	5.2E-02
T_T (m^2/s) =	1.7E-08	ξ (-) =	-1.97
S (-) =	1.0E-06		
K_s (m/s) =	3.4E-09		
S_s (1/m) =	2.0E-07		

Log-Log plot incl. derivatives- recovery period



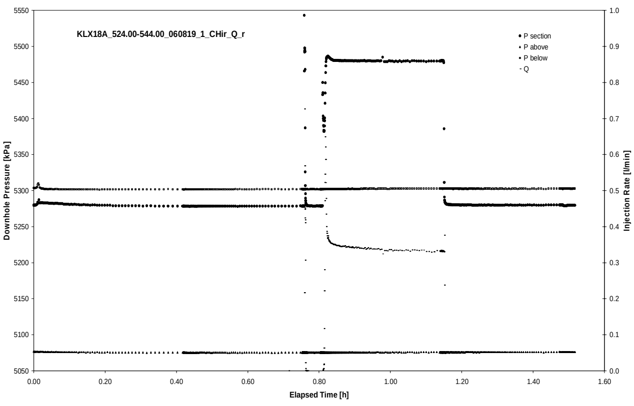
Comments:

The recommended transmissivity of 1.7E-8 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 8E-9 m2/s to 4E-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 5,096.4 kPa.

Test Summary Sheet

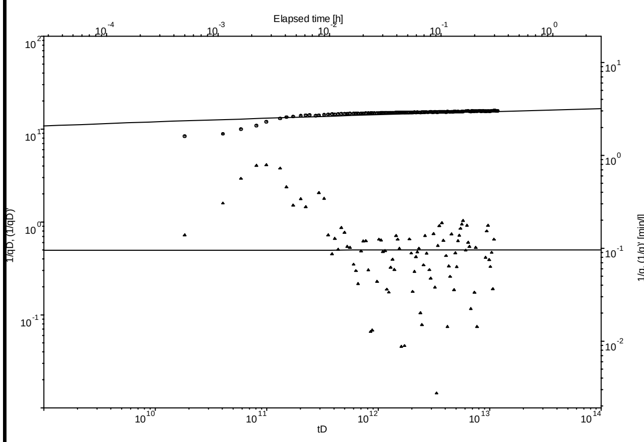
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060819 08:45
Test section from - to (m):	524.00-544.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

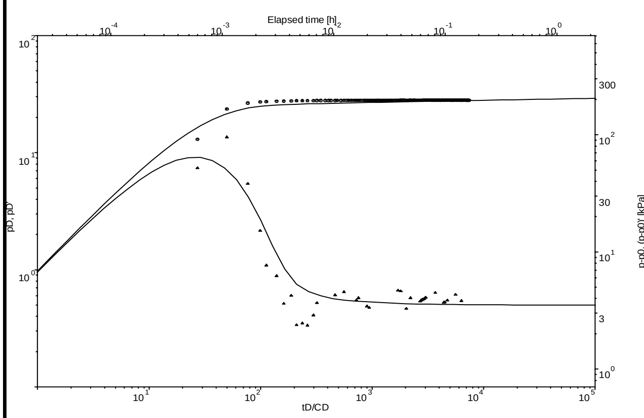


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5280		
p_i (kPa) =	5279		
p_p(kPa) =	5480	p_F (kPa) =	5280
Q_p (m^3/s)=	5.53E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15		
Derivative fact.=	0.04	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.7E-07		
T_M (m^2/s)=	2.8E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.57	dt_1 (min) =	0.42
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	6.8E-07	T (m^2/s) =	1.3E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.4E-08	K_s (m/s) =	6.3E-08
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.4E-11
C_D (-) =	NA	C_D (-) =	7.1E-03
ξ (-) =	8.45	ξ (-) =	20.90
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) =	0.57	C (m^3/Pa) =	6.4E-11
dt_2 (min) =	18.00	C_D (-) =	7.1E-03
T_T (m^2/s) =	6.8E-07	ξ (-) =	8.45
S (-) =	1.0E-06		
K_s (m/s) =	1.4E-07		
S_s (1/m) =	2.0E-07		

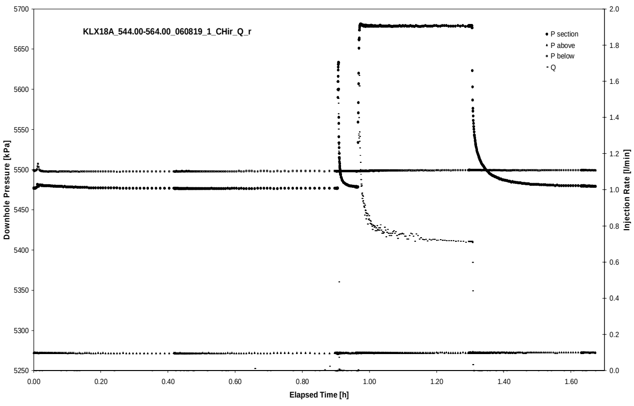
Comments:

The recommended transmissivity of 6.8E-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 1E-7 m2/s to 1E-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 5,279.7 kPa.

Test Summary Sheet

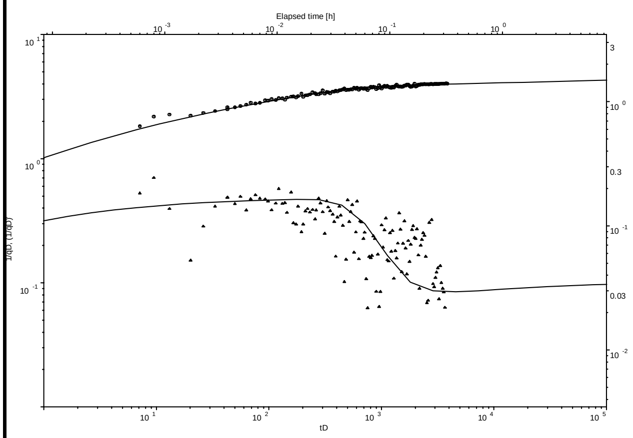
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060819 10:56
Test section from - to (m):	544.00-564.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

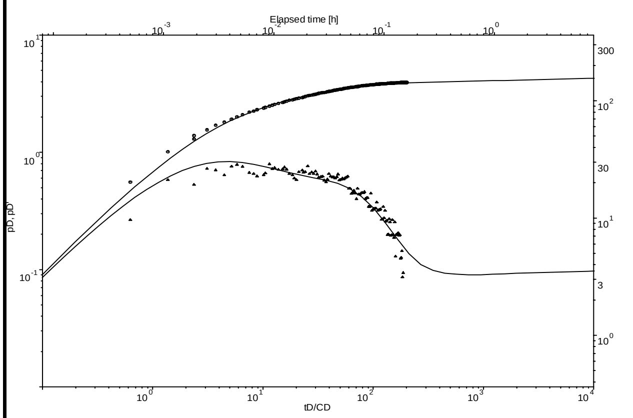


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5477		
p_i (kPa) =	5479		
p_p(kPa) =	5679	p_F (kPa) =	5480
Q_p (m^3/s)=	1.19E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.4		
Derivative fact.=	0.2	Derivative fact.=	0.04
Results		**Results**	
Q/s (m^2/s)=	5.8E-07		
T_M (m^2/s)=	6.1E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.15	dt_1 (min) =	0.27
dt_2 (min) =	2.10	dt_2 (min) =	3.30
T (m^2/s) =	3.8E-07	T (m^2/s) =	5.5E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.9E-08	K_s (m/s) =	2.7E-08
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.0E-09
C_D (-) =	NA	C_D (-) =	1.1E-01
ξ (-) =	-2.18	ξ (-) =	-2.35
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) =	0.27	C (m^3/Pa) =	1.0E-09
dt_2 (min) =	3.30	C_D (-) =	1.1E-01
T_T (m^2/s) =	5.5E-07	ξ (-) =	-2.35
S (-) =	1.0E-06		
K_s (m/s) =	1.1E-07		
S_s (1/m) =	2.0E-07		

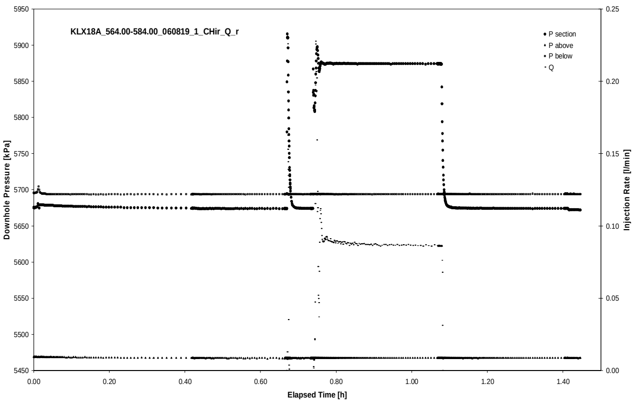
Comments:

The recommended transmissivity of 5.5E-7 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 1E-7 m2/s to 9E-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 5,477.6 kPa.

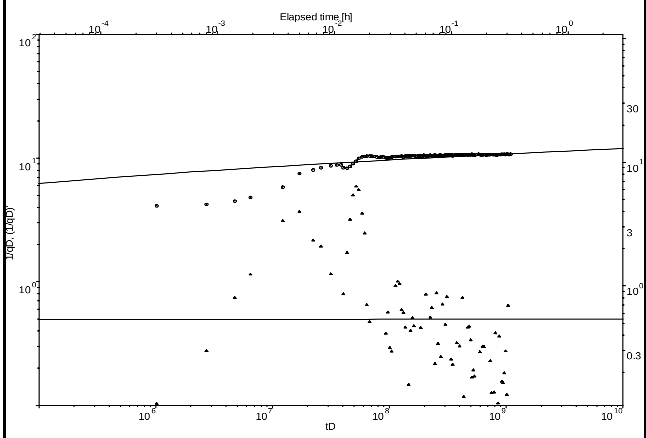
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060819 13:29
Test section from - to (m):	564.00-584.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

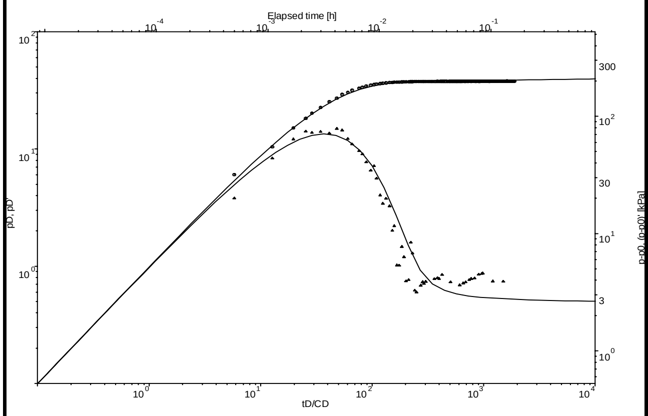
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5676		
p_i (kPa) =	5674		
p_p(kPa) =	5874	p_F (kPa) =	5674
Q_p (m^3/s)=	1.43E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.7		
Derivative fact.=	0.07	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	7.0E-08		
T_M (m^2/s)=	7.3E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.02	dt_1 (min) =	1.02
dt_2 (min) =	7.80	dt_2 (min) =	7.80
T (m^2/s) =	1.2E-07	T (m^2/s) =	4.4E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	6.1E-09	K_s (m/s) =	2.2E-08
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	8.8E-11
C_D (-) =	NA	C_D (-) =	9.7E-03
ξ (-) =	4.67	ξ (-) =	32.30
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) =	1.02	C (m^3/Pa) =	8.8E-11
dt_2 (min) =	7.80	C_D (-) =	9.7E-03
T_T (m^2/s) =	4.4E-07	ξ (-) =	32.30
S (-) =	1.0E-06		
K_s (m/s) =	8.9E-08		
S_s (1/m) =	2.0E-07		

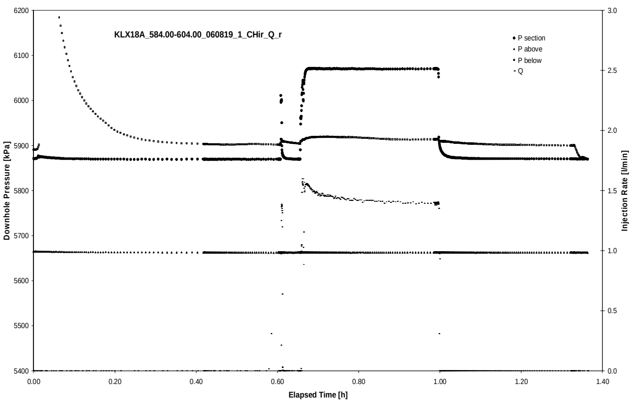
Comments:

The recommended transmissivity of 4.4E-7 m2/s was derived from the analysis of the CHir phase, which shows a derivative stabilization at late times. The confidence range for the interval transmissivity is estimated to be 1E-7 m2/s to 8E-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 5,673.7 kPa.

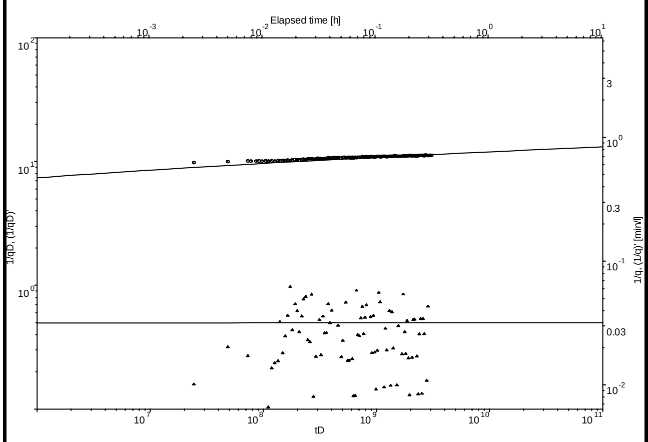
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060819 15:30
Test section from - to (m):	584.00-604.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

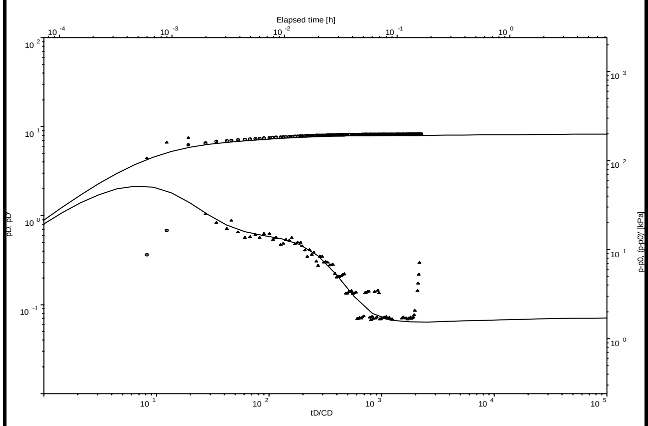
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5872		
p_i (kPa) =	5869		
p_p(kPa) =	6069	p_F (kPa) =	5870
Q_p (m^3/s)=	2.33E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	16		
Derivative fact.=	0.04	Derivative fact.=	0.06
Results		**Results**	
Q/s (m^2/s)=	1.1E-06		
T_M (m^2/s)=	1.2E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.78	dt_1 (min) =	0.18
dt_2 (min) =	16.20	dt_2 (min) =	1.02
T (m^2/s) =	2.0E-06	T (m^2/s) =	1.6E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.0E-07	K_s (m/s) =	7.8E-08
S_s (1/m) =	5.0E-08	S_s (1/m) =	5.0E-08
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.6E-10
C_D (-) =	NA	C_D (-) =	2.9E-02
ξ (-) =	3.78	ξ (-) =	1.79
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) =	0.18	C (m^3/Pa) =	2.6E-10
dt_2 (min) =	1.02	C_D (-) =	2.9E-02
T_T (m^2/s) =	1.6E-06	ξ (-) =	1.79
S (-) =	1.0E-06		
K_s (m/s) =	3.1E-07		
S_s (1/m) =	2.0E-07		

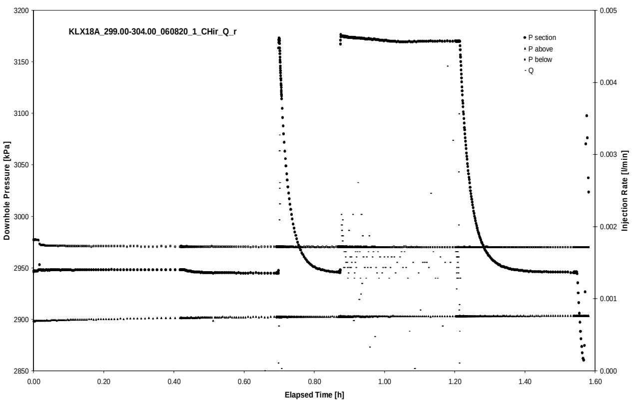
Comments:

The recommended transmissivity of 1.6E-6 m2/s was derived from the analysis of the CHir phase (inner zone), which shows a derivative stabilization at middle times. The confidence range for the interval transmissivity is estimated to be 8E-7 m2/s to 3E-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 5,869.7 kPa.

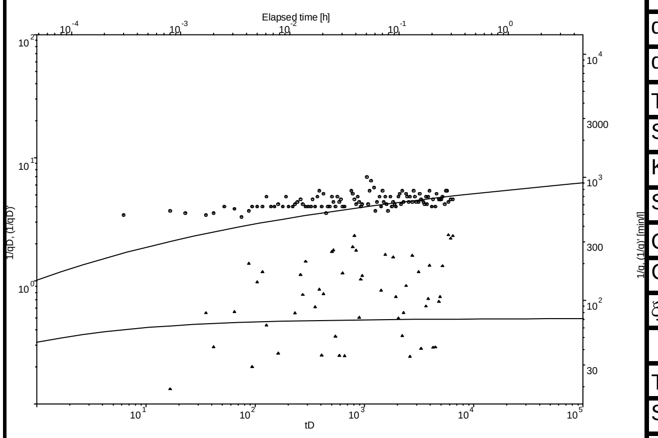
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060820 08:53
Test section from - to (m):	299.00-304.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, 2·r_w (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

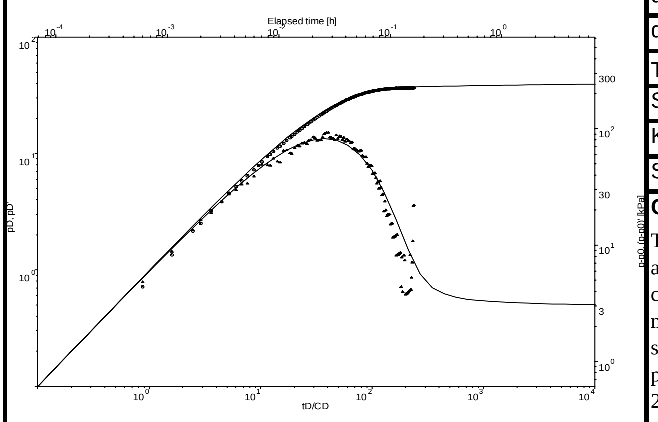
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	2947		
p_i (kPa) =	2945		
p_p(kPa) =	3170	p_F (kPa) =	2946
Q_p (m^3/s)=	2.50E-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)=	11.2		
Derivative fact.=	0.15	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.1E-09		
T_M (m^2/s)=	9.0E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.18	dt_1 (min) =	6.00
dt_2 (min) =	15.00	dt_2 (min) =	9.00
T (m^2/s) =	8.0E-10	T (m^2/s) =	6.5E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.6E-10	K_s (m/s) =	1.3E-09
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.0E-11
C_D (-) =	NA	C_D (-) =	1.1E-03
ξ (-) =	1.17	ξ (-) =	33.30
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) =	6.00	C (m^3/Pa) =	1.0E-11
dt_2 (min) =	9.00	C_D (-) =	1.1E-03
T_T (m^2/s) =	6.5E-09	ξ (-) =	33.30
S (-) =	1.0E-06		
K_s (m/s) =	1.3E-09		
S_s (1/m) =	2.0E-07		

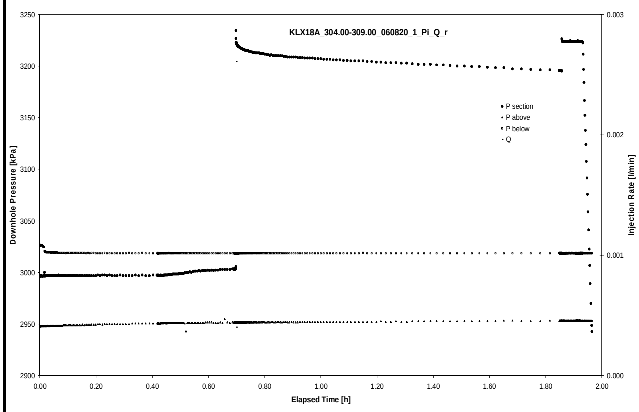
Comments:

The recommended transmissivity of 6.5E-9 m2/s was derived from the analysis of the CHir phase, because of its better data quality. The confidence range for the interval transmissivity is estimated to be 1E-9 m2/s to 1E-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 2,942.8 kPa.

Test Summary Sheet

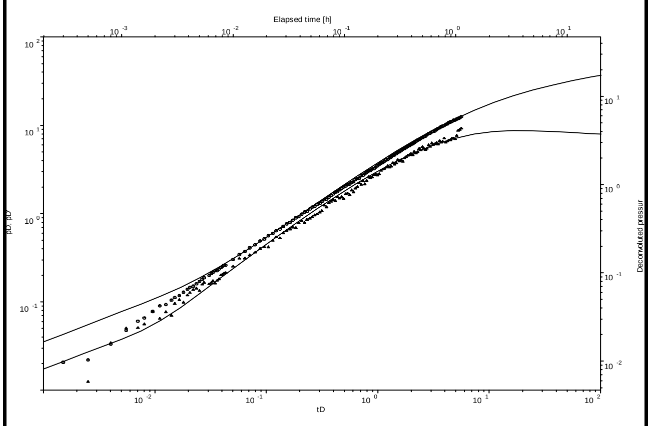
Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060820 10:58
Test section from - to (m):	304.00-309.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	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) =	2996		
p_i (kPa) =	3006		
p_p(kPa) =	3234	p_F (kPa) =	3195
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	4140
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.3		
Derivative fact.=	NA	Derivative fact.=	0.08
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	0.72
dt_2 (min) =	NA	dt_2 (min) =	10.20
T (m^2/s) =	NA	T (m^2/s) =	1.3E-11
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	2.7E-12
S_s (1/m) =	NA	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.5E-11
C_D (-) =	NA	C_D (-) =	1.6E-03
ξ (-) =	NA	ξ (-) =	-0.95
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) =	0.72	C (m^3/Pa) =	1.5E-11
dt_2 (min) =	10.20	C_D (-) =	1.6E-03
T_T (m^2/s) =	1.3E-11	ξ (-) =	-0.95
S (-) =	1.0E-06		
K_s (m/s) =	2.7E-12		
S_s (1/m) =	2.0E-07		

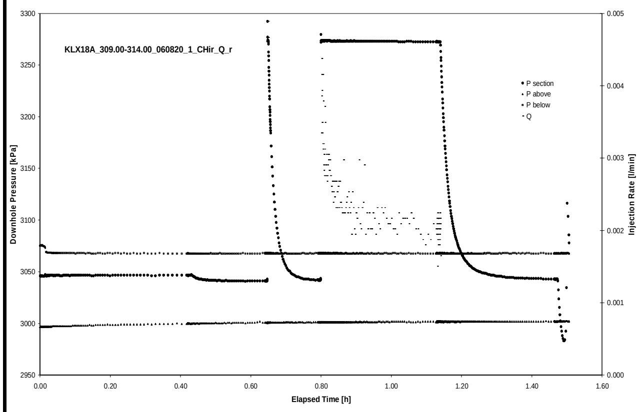
Comments:

The recommended transmissivity of 1.3E-11 m2/s was derived from the analysis of the Pi phase (inner zone). The confidence range for the interval transmissivity is estimated to be 2E-12 to 3E-11 m2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

Test Summary Sheet

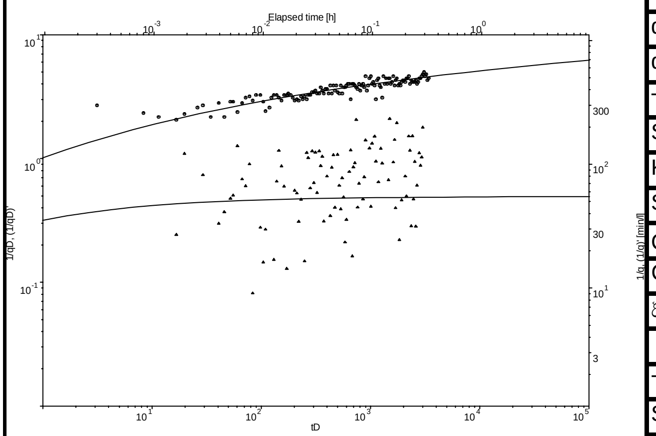
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060820 13:33
Test section from - to (m):	309.00-314.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, 2·r_w (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

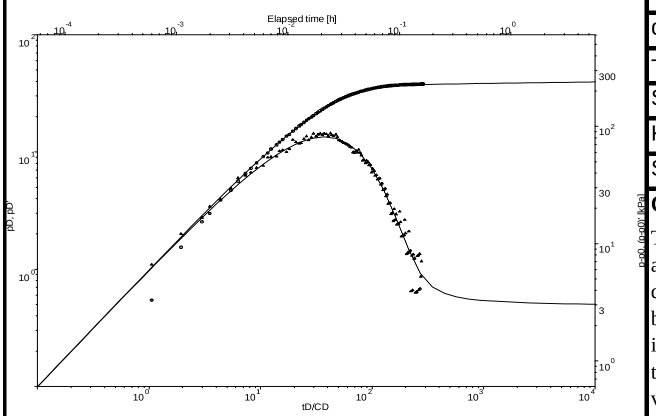


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3046		
p_i (kPa) =	3042		
p_p(kPa) =	3273	p_F (kPa) =	3043
Q_p (m^3/s)=	3.33E-08		
tp (s) =	1200	t_F (s) =	1200
S el S* (-)=	1.00E-06	S el S* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.4		
Derivative fact.=	0.12	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.4E-09		
T_M (m^2/s)=	1.2E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.24	dt_1 (min) =	3.00
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	1.0E-09	T (m^2/s) =	9.7E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.0E-10	K_s (m/s) =	1.9E-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 (-) =	0.71	ξ (-) =	33.20
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) =	3.00	C (m^3/Pa) =	1.3E-11
dt_2 (min) =	9.00	C_D (-) =	1.4E-03
T_T (m^2/s) =	9.7E-09	ξ (-) =	33.20
S (-) =	1.0E-06		
K_s (m/s) =	1.9E-09		
S_s (1/m) =	2.0E-07		

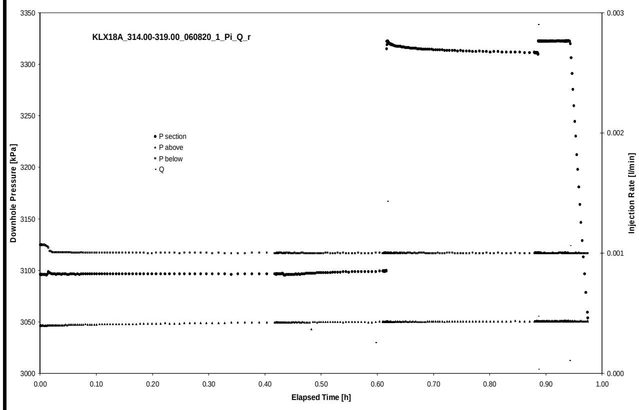
Comments:

The recommended transmissivity of 9.7E-9 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 6E-9 m2/s to 4E-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 3,037.7 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060820 15:29
Test section from - to (m):	314.00-319.00 m	Responsible for test execution:	Reinder van der Wall 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) =	3096		
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)=	NA		
$Temp_w$(gr C)=	11.5		
Derivative fact.=	NA	Derivative fact.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

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

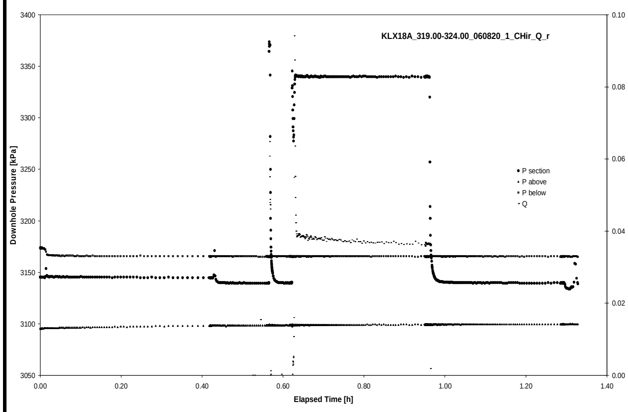
Comments:

Based on the test response the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

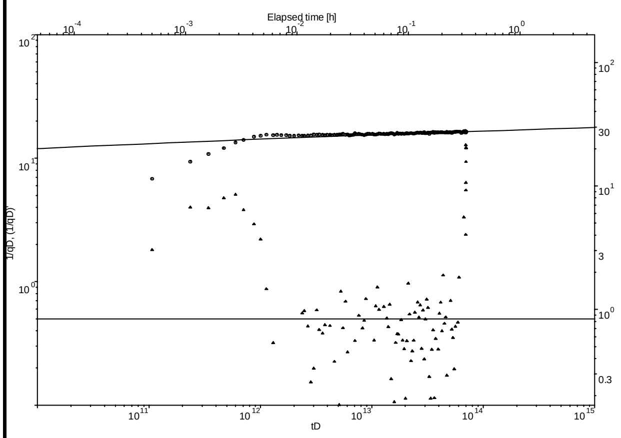
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060820 16:52
Test section from - to (m):	319.00-324.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

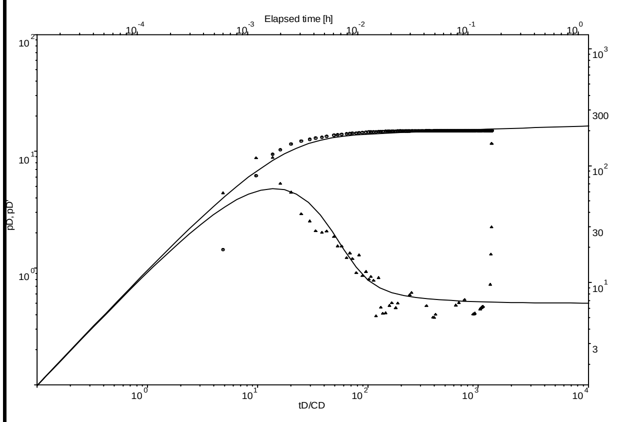


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3145		
p_i (kPa) =	3140		
p_p(kPa) =	3339	p_F (kPa) =	3139
Q_p (m^3/s)=	6.00E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.6		
Derivative fact.=	0.11	Derivative fact.=	0.01
Results		**Results**	
Q/s (m^2/s)=	3.0E-08		
T_M (m^2/s)=	2.4E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.60	dt_1 (min) =	0.90
dt_2 (min) =	16.20	dt_2 (min) =	9.00
T (m^2/s) =	7.8E-08	T (m^2/s) =	7.3E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.6E-08	K_s (m/s) =	1.5E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.1E-11
C_D (-) =	NA	C_D (-) =	2.3E-03
ξ (-) =	10.40	ξ (-) =	9.96
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) =	0.90	C (m^3/Pa) =	2.1E-11
dt_2 (min) =	9.00	C_D (-) =	2.3E-03
T_T (m^2/s) =	7.3E-08	ξ (-) =	9.96
S (-) =	1.0E-06		
K_s (m/s) =	1.5E-08		
S_s (1/m) =	2.0E-07		

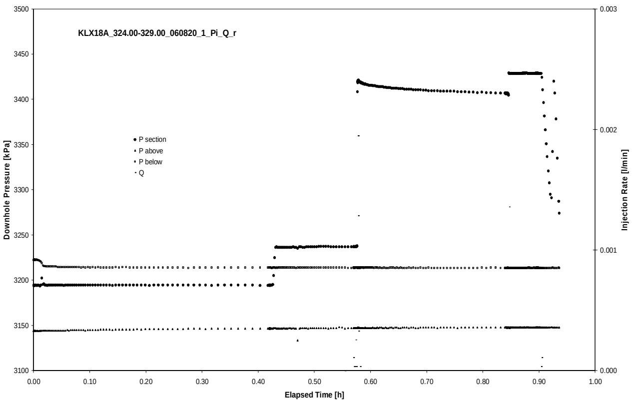
Comments:

The recommended transmissivity of 7.3E-8 m2/s was derived from the analysis of the CHir phase, which shows the clearest derivative stabilization. The confidence range for the interval transmissivity is estimated to be 4E-8 m2/s to 2E-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 3,138.9 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060820 18:35
Test section from - to (m):	324.00-329.00 m	Responsible for test execution:	Reinder van der Wall 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) =	3194		
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)=	NA		
$Temp_w$(gr C)=	11.7		
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) =	NA	T (m^2/s) =	NA
S (-) =	NA	S (-) =	NA
K_s (m/s) =	NA	K_s (m/s) =	NA
S_s (1/m) =	NA	S_s (1/m) =	NA
C (m^3/Pa) =	NA	C (m^3/Pa) =	NA
C_D (-) =	NA	C_D (-) =	NA
ξ (-) =	NA	ξ (-) =	NA
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period

Not Analysed

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

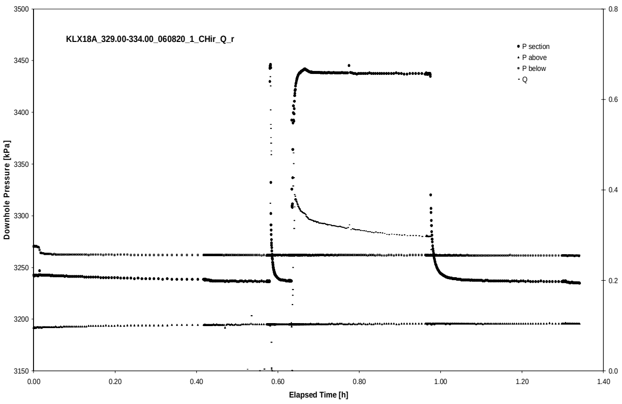
Comments:

Based on the test response the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

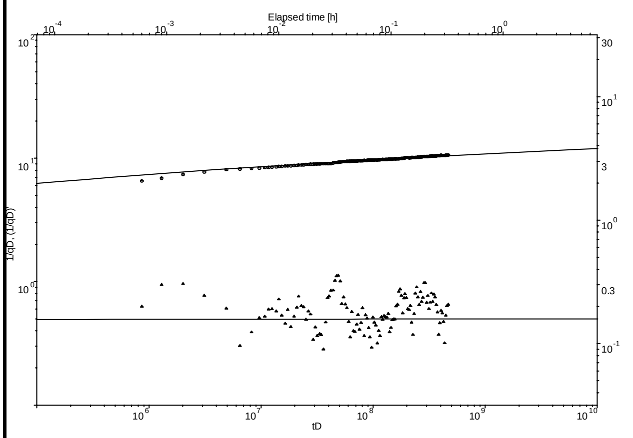
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060820 19:53
Test section from - to (m):	329.00-334.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

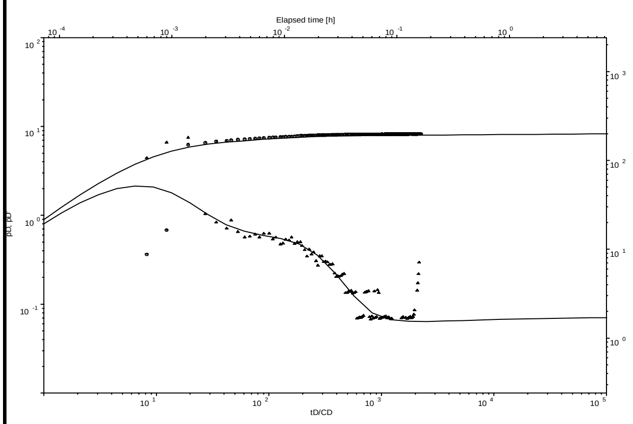


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3242		
p_i (kPa) =	3236		
p_p(kPa) =	3437	p_F (kPa) =	3236
Q_p (m^3/s)=	5.00E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.8		
Derivative fact.=	0.05	Derivative fact.=	0.01
Results		**Results**	
Q/s (m^2/s)=	2.4E-07		
T_M (m^2/s)=	2.0E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.39	dt_1 (min) =	0.12
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	4.1E-07	T (m^2/s) =	1.6E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	8.2E-08	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) =	2.6E-10
C_D (-) =	NA	C_D (-) =	2.9E-02
ξ (-) =	3.63	ξ (-) =	1.79
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) =	0.39	C (m^3/Pa) =	2.6E-10
dt_2 (min) =	18.00	C_D (-) =	2.9E-02
T_T (m^2/s) =	4.1E-07	ξ (-) =	3.63
S (-) =	1.0E-06		
K_s (m/s) =	8.2E-08		
S_s (1/m) =	2.0E-07		

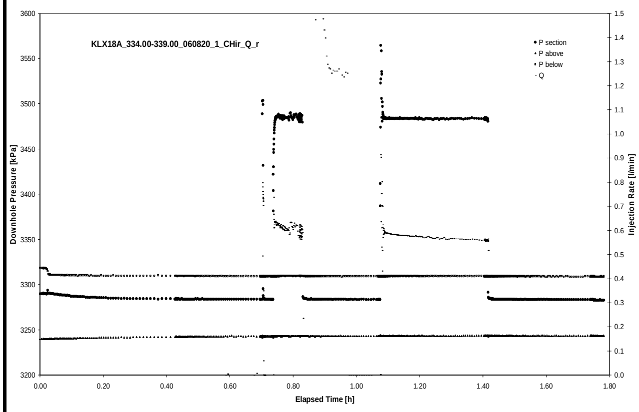
Comments:

The recommended transmissivity of 4.1E-7 m2/s was derived from the analysis of the CHi phase, which shows better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 1E-7 m2/s to 7E-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 3,234.0 kPa.

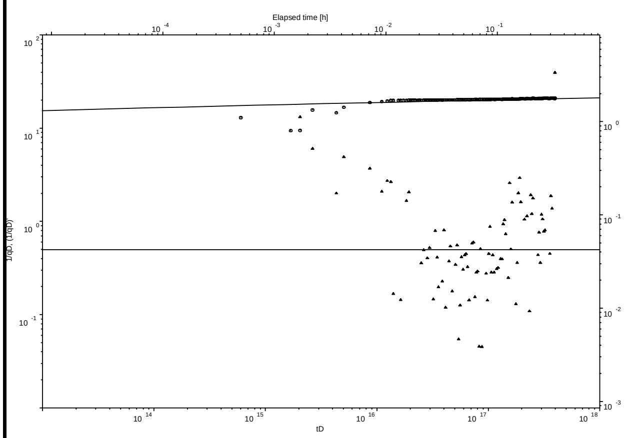
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060820 21:58
Test section from - to (m):	334.00-339.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

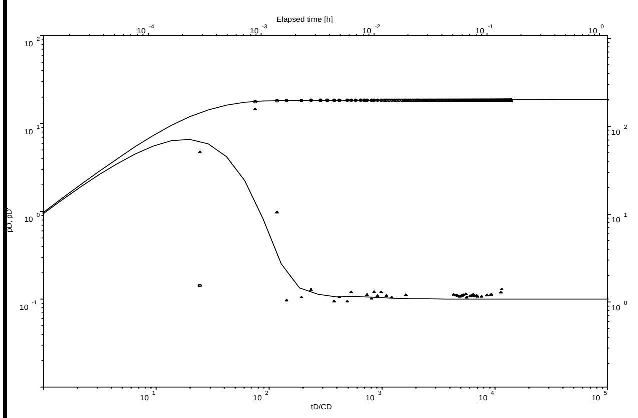
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3290		
p_i (kPa) =	3284		
p_p(kPa) =	3484	p_F (kPa) =	3282
Q_p (m^3/s)=	9.33E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.9		
Derivative fact.=	0.01	Derivative fact.=	0.09
Results		**Results**	
Q/s (m^2/s)=	4.6E-07		
T_M (m^2/s)=	3.8E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.20	dt_1 (min) =	0.12
dt_2 (min) =	6.00	dt_2 (min) =	9.00
T (m^2/s) =	1.5E-06	T (m^2/s) =	7.0E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.1E-07	K_s (m/s) =	1.4E-06
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.8E-11
C_D (-) =	NA	C_D (-) =	4.2E-03
ξ (-) =	13.20	ξ (-) =	15.40
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) =	0.12	C (m^3/Pa) =	3.8E-11
dt_2 (min) =	9.00	C_D (-) =	4.2E-03
T_T (m^2/s) =	7.0E-06	ξ (-) =	15.40
S (-) =	1.0E-06		
K_s (m/s) =	1.4E-06		
S_s (1/m) =	2.0E-07		

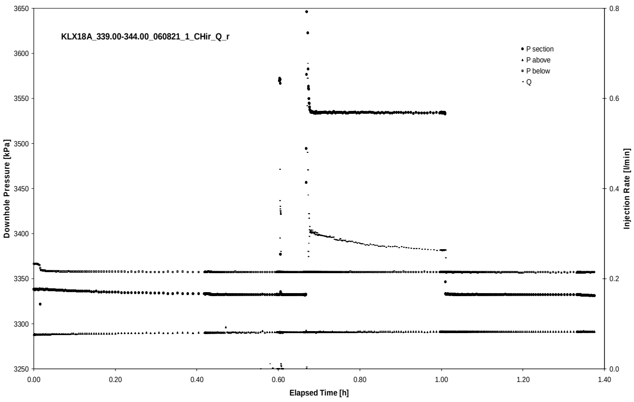
Comments:

The recommended transmissivity of 7.0E-6 m2/s was derived from the analysis of the CHir phase (outer zone), which shows a horizontal stabilization of the derivative. The confidence range for the interval transmissivity is estimated to be 1E-6 m2/s to 1E-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 3,283.3 kPa.

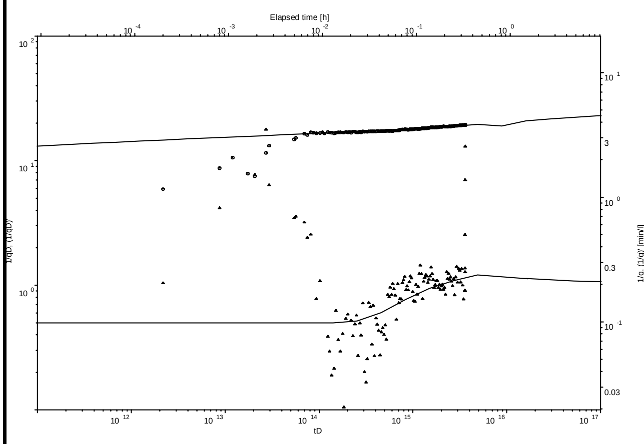
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060821 00:08
Test section from - to (m):	339.00-344.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

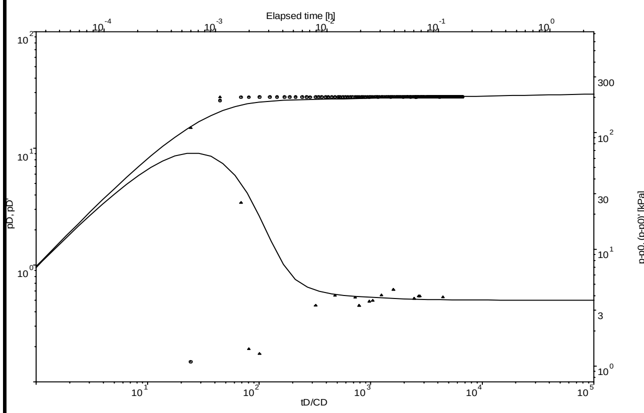
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3338		
p_i (kPa) =	3332		
p_p(kPa) =	3533	p_F (kPa) =	3332
Q_p (m^3/s)=	4.33E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	11.9		
Derivative fact.=	0.12	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.1E-07		
T_M (m^2/s)=	1.7E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	4.20	dt_1 (min) =	0.42
dt_2 (min) =	18.00	dt_2 (min) =	6.00
T (m^2/s) =	3.2E-07	T (m^2/s) =	1.0E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	6.4E-08	K_s (m/s) =	2.0E-07
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.7E-11
C_D (-) =	NA	C_D (-) =	6.2E-03
ξ (-) =	11.30	ξ (-) =	21.00
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) =	4.20	C (m^3/Pa) =	5.7E-11
dt_2 (min) =	18.00	C_D (-) =	6.2E-03
T_T (m^2/s) =	3.2E-07	ξ (-) =	11.30
S (-) =	1.0E-06		
K_s (m/s) =	6.4E-08		
S_s (1/m) =	2.0E-07		

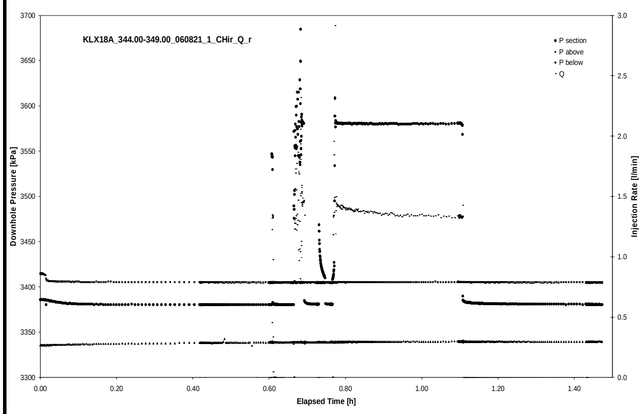
Comments:

The recommended transmissivity of 3.2E-7 m2/s was derived from the analysis of the CHi phase (outer zone), which shows a slight horizontal stabilization of the derivative. The confidence range for the interval transmissivity is estimated to be 9E-8 m2/s to 6E-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 3,332.1 kPa.

Test Summary Sheet

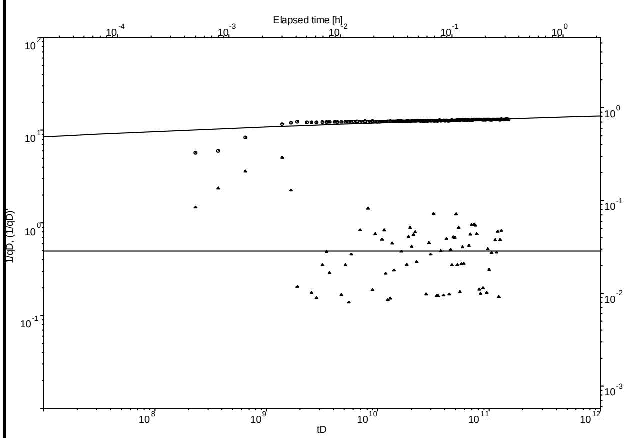
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060821 01:55
Test section from - to (m):	344.00-349.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

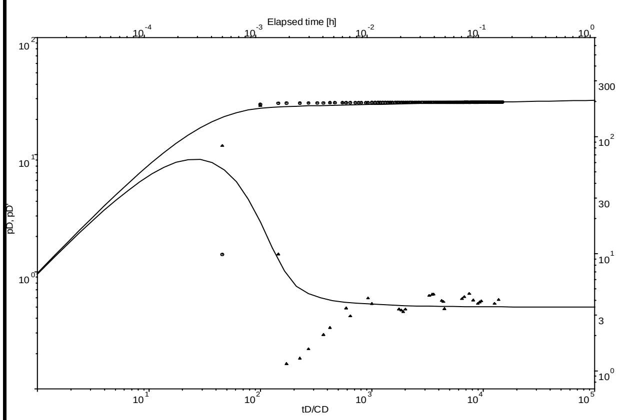


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3386		
p_i (kPa) =	3381		
p_p(kPa) =	3581	p_F (kPa) =	3381
Q_p (m^3/s)=	2.21E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12		
Derivative fact.=	0.04	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.1E-06		
T_M (m^2/s)=	8.9E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.36	dt_1 (min) =	0.36
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	2.3E-06	T (m^2/s) =	5.1E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	4.5E-07	K_s (m/s) =	1.0E-06
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.3E-10
C_D (-) =	NA	C_D (-) =	1.4E-02
ξ (-) =	5.66	ξ (-) =	20.60
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) =	0.36	C (m^3/Pa) =	1.3E-10
dt_2 (min) =	18.00	C_D (-) =	1.4E-02
T_T (m^2/s) =	2.3E-06	ξ (-) =	5.66
S (-) =	1.0E-06		
K_s (m/s) =	4.5E-07		
S_s (1/m) =	2.0E-07		

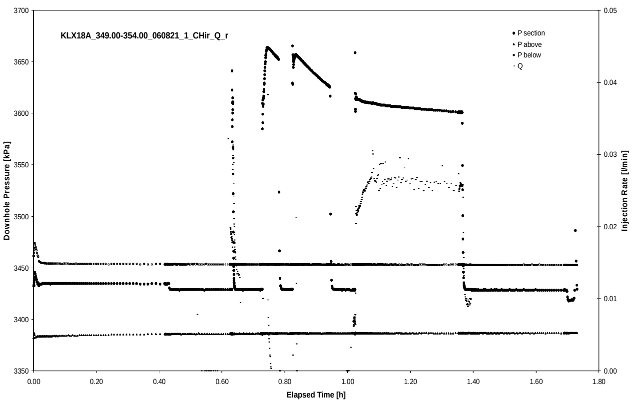
Comments:

The recommended transmissivity of 2.3E-6 m2/s was derived from the analysis of the CHi phase, because it shows a better quality. The confidence range for the interval transmissivity is estimated to be 8E-7 m2/s to 6E-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 3,380.4 kPa.

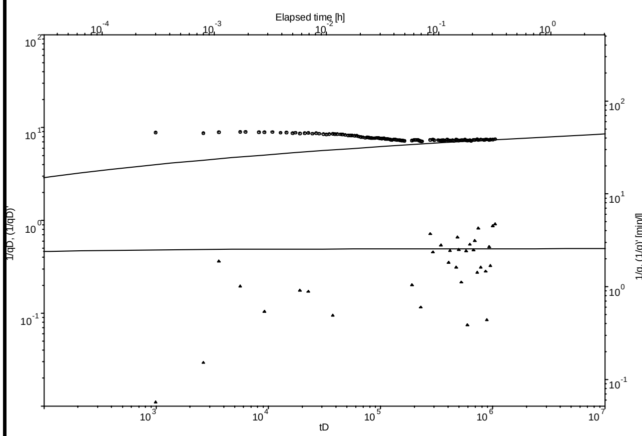
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060821 06:23
Test section from - to (m):	349.00-354.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

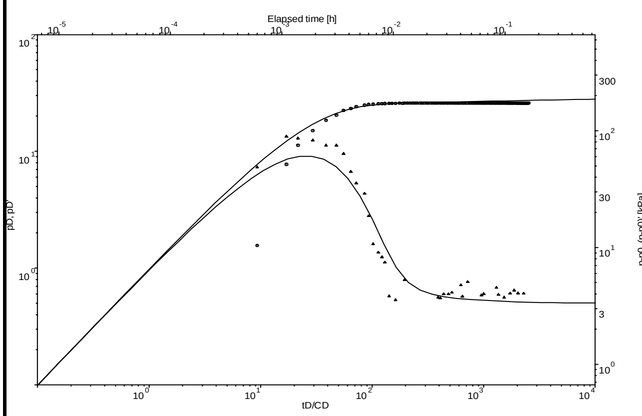
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3433		
p_i (kPa) =	3428		
p_p(kPa) =	3601	p_F (kPa) =	3428
Q_p (m^3/s)=	4.32E-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.=	0.05	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.4E-08		
T_M (m^2/s)=	2.0E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	4.80	dt_1 (min) =	0.60
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	2.9E-08	T (m^2/s) =	1.0E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.8E-09	K_s (m/s) =	2.0E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.5E-11
C_D (-) =	NA	C_D (-) =	1.7E-03
ξ (-) =	1.91	ξ (-) =	21.60
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) =	0.60	C (m^3/Pa) =	1.5E-11
dt_2 (min) =	9.00	C_D (-) =	1.7E-03
T_T (m^2/s) =	1.0E-07	ξ (-) =	21.60
S (-) =	1.0E-06		
K_s (m/s) =	2.0E-08		
S_s (1/m) =	2.0E-07		

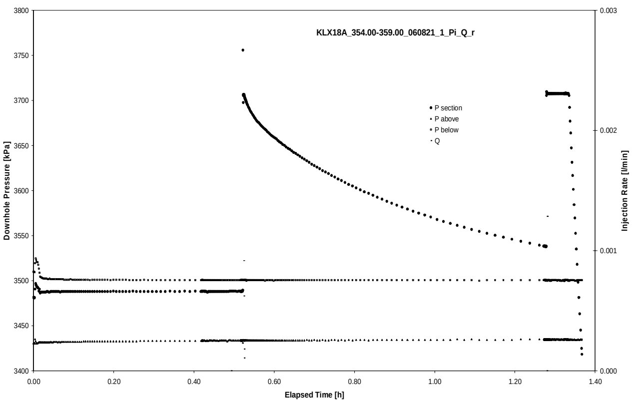
Comments:

The recommended transmissivity of 1.0E-7 m2/s was derived from the analysis of the CHir phase, because of its derivative stabilization at late times. The confidence range for the interval transmissivity is estimated to be 5E-8 m2/s to 5E-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 3,428.1 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060821 08:44
Test section from - to (m):	354.00-359.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

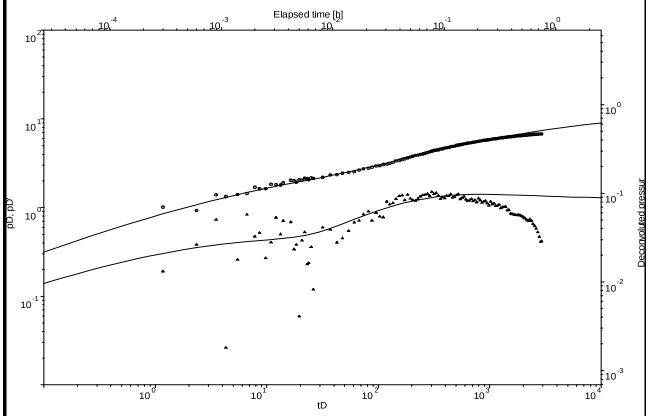
Linear plot Q and p



Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3491		
p_i (kPa) =	3489		
p_p(kPa) =	3707	p_F (kPa) =	3538
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	2700
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.2		
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) =	1.80
dt_2 (min) =	NA	dt_2 (min) =	33.00
T (m^2/s) =	NA	T (m^2/s) =	7.9E-10
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	1.6E-10
S_s (1/m) =	NA	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.1E-10
C_D (-) =	NA	C_D (-) =	3.4E-02
ξ (-) =	NA	ξ (-) =	-0.12
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) =	1.80	C (m^3/Pa) =	3.1E-10
dt_2 (min) =	33.00	C_D (-) =	3.4E-02
T_T (m^2/s) =	7.9E-10	ξ (-) =	-0.12
S (-) =	1.0E-06		
K_s (m/s) =	1.6E-10		
S_s (1/m) =	2.0E-07		

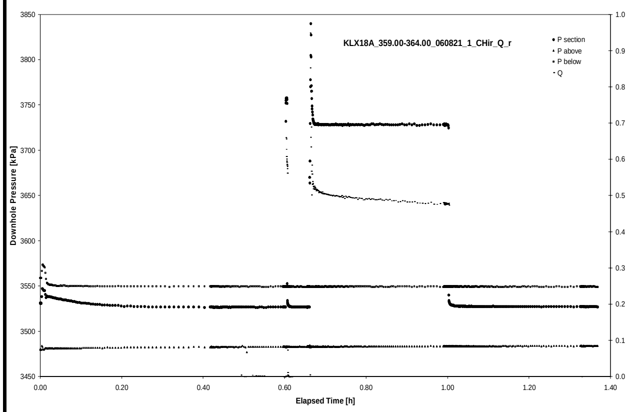
Comments:

The recommended transmissivity of 7.9E-10 m2/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 3E-10 to 9E-10 m2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

Test Summary Sheet

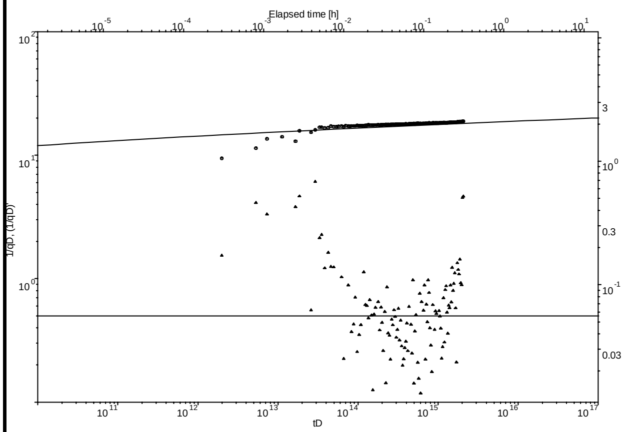
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060821 10:37
Test section from - to (m):	359.00-364.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

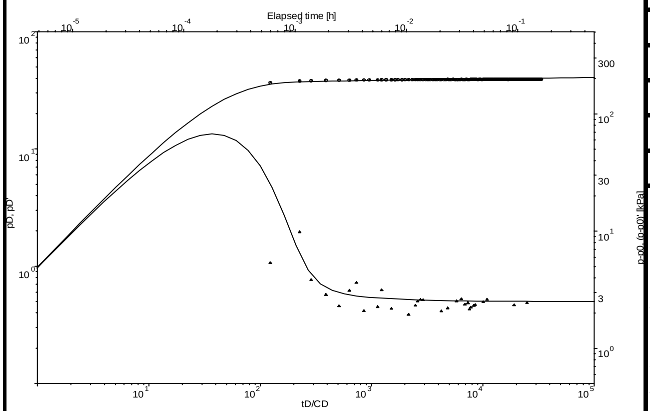


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	3531		
p_i (kPa) =	3527		
p_p(kPa) =	3728	p_F (kPa) =	3527
Q_p (m³/s)=	7.98E-06		
tp (s) =	1200	t_F (s) =	1200
S el S* (-)=	1.00E-06	S el S* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.2		
Derivative fact.=	0.05	Derivative fact.=	0.04
Results		**Results**	
Q/s (m²/s)=	3.9E-07		
T_M (m²/s)=	3.2E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.72	dt_1 (min) =	0.10
dt_2 (min) =	15.00	dt_2 (min) =	7.20
T (m²/s) =	1.2E-06	T (m²/s) =	2.6E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.3E-07	K_s (m/s) =	5.1E-07
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m³/Pa) =	NA	C (m³/Pa) =	2.9E-11
C_D (-) =	NA	C_D (-) =	3.2E-03
ξ (-) =	10.80	ξ (-) =	32.80
T_{GRF}(m²/s) =	NA	T_{GRF}(m²/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) =	0.72	C (m³/Pa) =	2.9E-11
dt_2 (min) =	15.00	C_D (-) =	3.2E-03
T_T (m²/s) =	1.2E-06	ξ (-) =	10.80
S (-) =	1.0E-06		
K_s (m/s) =	2.3E-07		
S_s (1/m) =	2.0E-07		

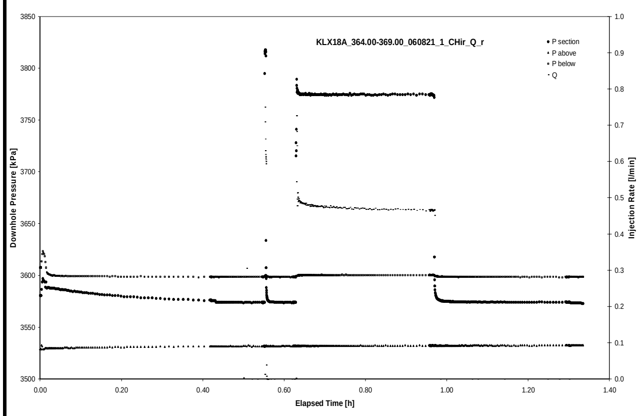
Comments:

The recommended transmissivity of 1.2E-6 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 7E-7 m2/s to 4E-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 3,527.2 kPa.

Test Summary Sheet

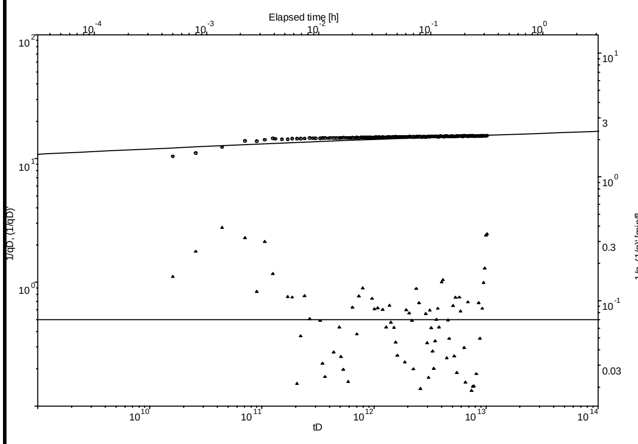
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060821 13:02
Test section from - to (m):	364.00-369.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

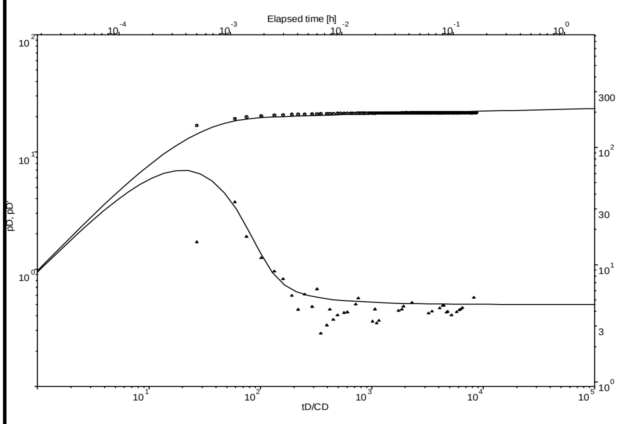


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3581		
p_i (kPa) =	3574		
p_p(kPa) =	3775	p_F (kPa) =	3575
Q_p (m^3/s)=	7.75E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.3		
Derivative fact.=	0.03	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	3.8E-07		
T_M (m^2/s)=	3.1E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.33	dt_1 (min) =	0.21
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	9.2E-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) =	5.8E-11
C_D (-) =	NA	C_D (-) =	6.3E-03
ξ (-) =	8.23	ξ (-) =	15.20
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) =	0.21	C (m^3/Pa) =	5.8E-11
dt_2 (min) =	9.00	C_D (-) =	6.3E-03
T_T (m^2/s) =	1.3E-06	ξ (-) =	15.20
S (-) =	1.0E-06		
K_s (m/s) =	2.7E-07		
S_s (1/m) =	2.0E-07		

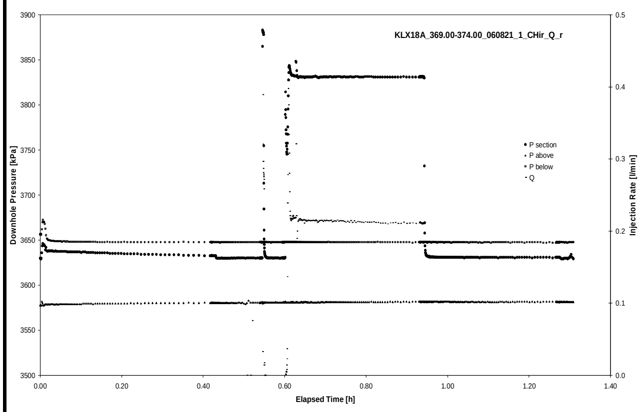
Comments:

The recommended transmissivity of 1.3E-6 m2/s was derived from the analysis of the CHir phase, which shows a horizontal derivative stabilization. The confidence range for the interval transmissivity is estimated to be 7E-7 m2/s to 3E-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 3,573.6 kPa.

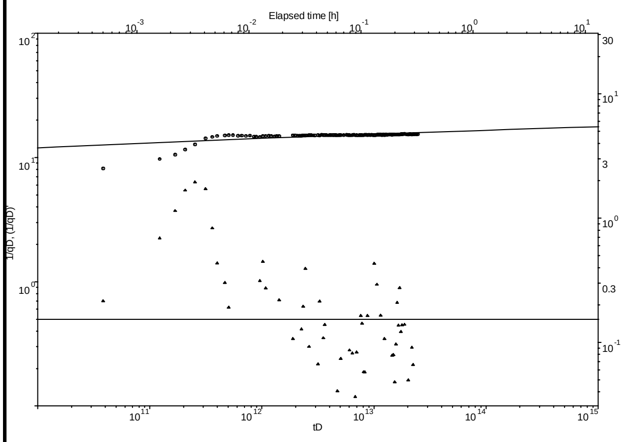
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060821 15:02
Test section from - to (m):	369.00-374.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

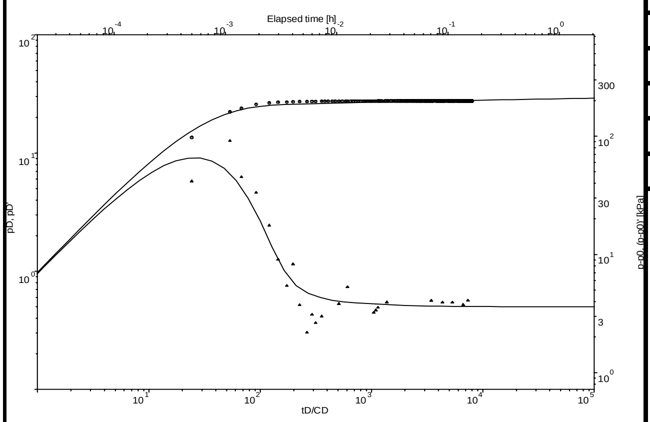
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3629		
p_i (kPa) =	3630		
p_p(kPa) =	3831	p_F (kPa) =	3630
Q_p (m^3/s)=	3.50E-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)=	12.4		
Derivative fact.=	0.03	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.7E-07		
T_M (m^2/s)=	1.4E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.50	dt_1 (min) =	0.24
dt_2 (min) =	16.20	dt_2 (min) =	9.00
T (m^2/s) =	4.2E-07	T (m^2/s) =	7.8E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	8.4E-08	K_s (m/s) =	1.6E-07
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.7E-11
C_D (-) =	NA	C_D (-) =	4.1E-03
ξ (-) =	9.05	ξ (-) =	21.20
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) =	0.24	C (m^3/Pa) =	3.7E-11
dt_2 (min) =	9.00	C_D (-) =	4.1E-03
T_T (m^2/s) =	7.8E-07	ξ (-) =	21.20
S (-) =	1.0E-06		
K_s (m/s) =	1.6E-07		
S_s (1/m) =	2.0E-07		

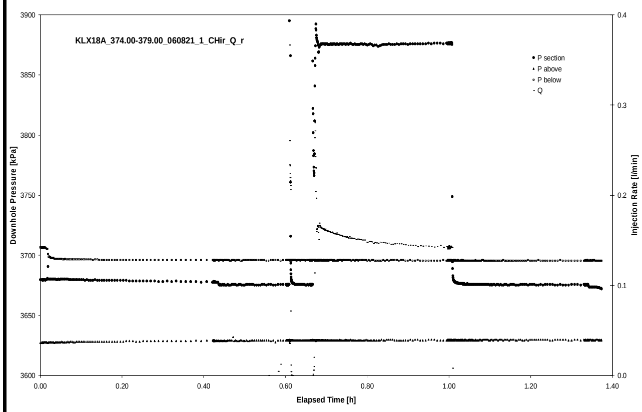
Comments:

The recommended transmissivity of 7.8E-7 m2/s was derived from the analysis of the CHir phase, which shows a horizontal stabilization of the derivative. The confidence range for the interval transmissivity is estimated to be 3E-7 m2/s to 1E-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 3,630.7 kPa.

Test Summary Sheet

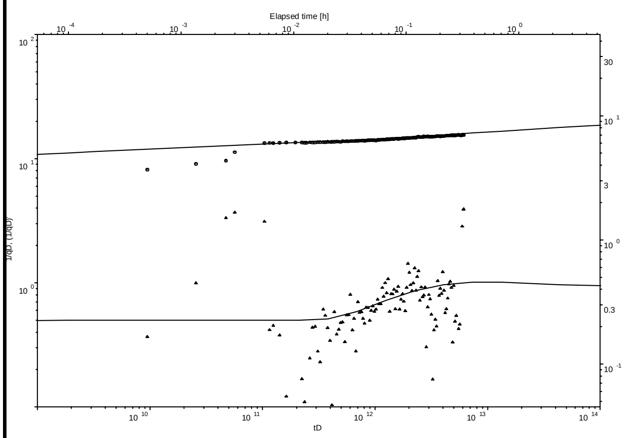
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060821 16:42
Test section from - to (m):	374.00-379.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

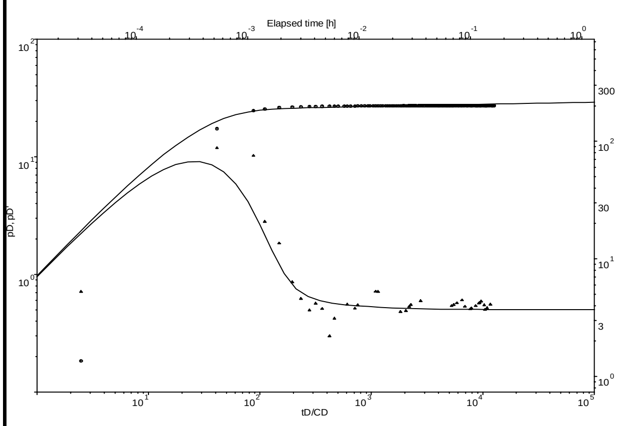


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3679		
p_i (kPa) =	3675		
p_p(kPa) =	3875	p_F (kPa) =	3675
Q_p (m^3/s)=	2.33E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.5		
Derivative fact.=	0.07	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.1E-07		
T_M (m^2/s)=	9.4E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	7.20	dt_1 (min) =	0.18
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	1.5E-07	T (m^2/s) =	5.3E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.0E-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 (-) =	8.54	ξ (-) =	21.60
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) =	7.20	C (m^3/Pa) =	1.6E-11
dt_2 (min) =	18.00	C_D (-) =	1.7E-03
T_T (m^2/s) =	1.5E-07	ξ (-) =	8.54
S (-) =	1.0E-06		
K_s (m/s) =	3.0E-08		
S_s (1/m) =	2.0E-07		

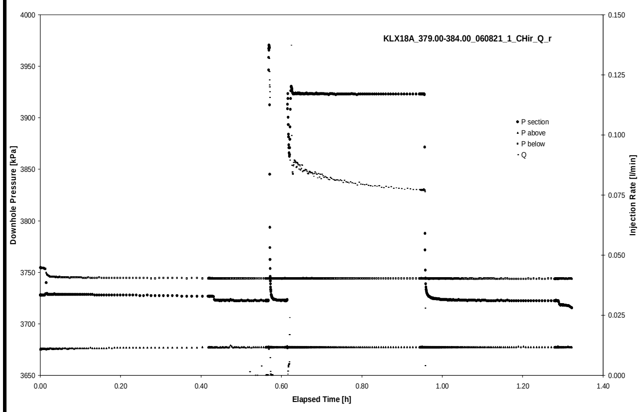
Comments:

The recommended transmissivity of 1.5E-7 m2/s was derived from the analysis of the CHi phase (outer zone), which shows a better data quality and a slight horizontal stabilization of the derivative. The confidence range for the interval transmissivity is estimated to be 7E-8 m2/s to 3E-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 3675.2 kPa.

Test Summary Sheet

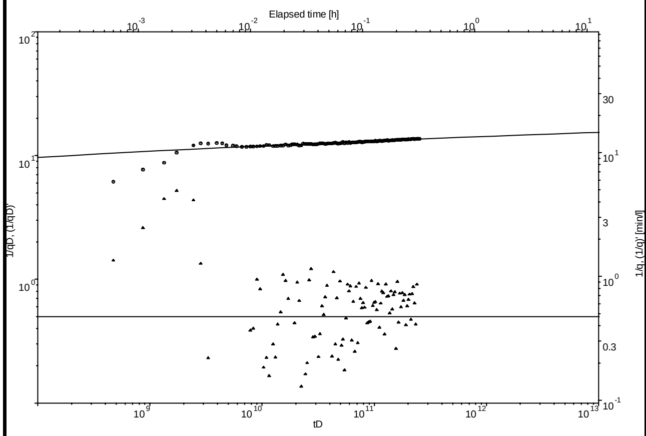
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060821 18:28
Test section from - to (m):	379.00-384.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3727		
p_i (kPa) =	3723		
p_p(kPa) =	3922	p_F (kPa) =	3723
Q_p (m^3/s)=	1.28E-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)=	12.6		
Derivative fact.=	0.07	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	6.3E-08		
T_M (m^2/s)=	5.2E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.60	dt_1 (min) =	0.42
dt_2 (min) =	18.00	dt_2 (min) =	9.00
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) =	2.8E-08	K_s (m/s) =	5.8E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.2E-11
C_D (-) =	NA	C_D (-) =	2.4E-03
ξ (-) =	7.30	ξ (-) =	21.40
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

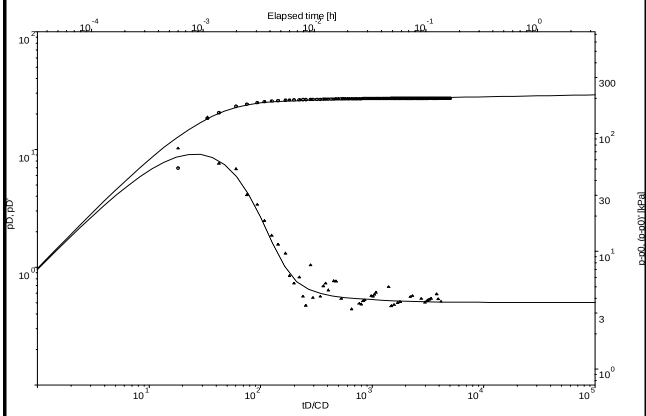
Log-Log plot incl. derivates- flow period



Selected representative parameters.

dt_1 (min) =	0.42	C (m^3/Pa) =	2.2E-11
dt_2 (min) =	9.00	C_D (-) =	2.4E-03
T_T (m^2/s) =	2.9E-07	ξ (-) =	21.40
S (-) =	1.0E-06		
K_s (m/s) =	5.8E-08		
S_s (1/m) =	2.0E-07		

Log-Log plot incl. derivatives- recovery period



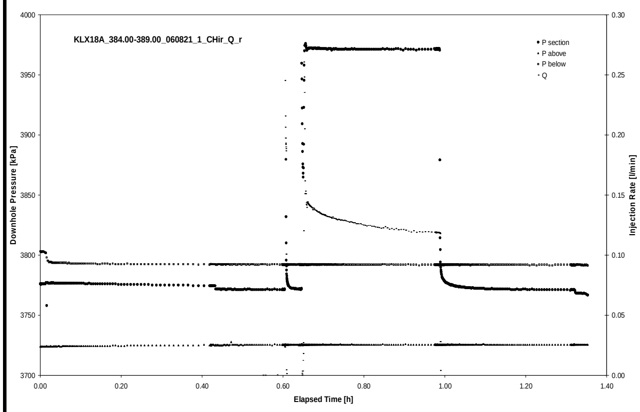
Comments:

The recommended transmissivity of 2.9E-7 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 9.0E-8 m2/s to 5E-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 3,721.3 kPa.

Test Summary Sheet

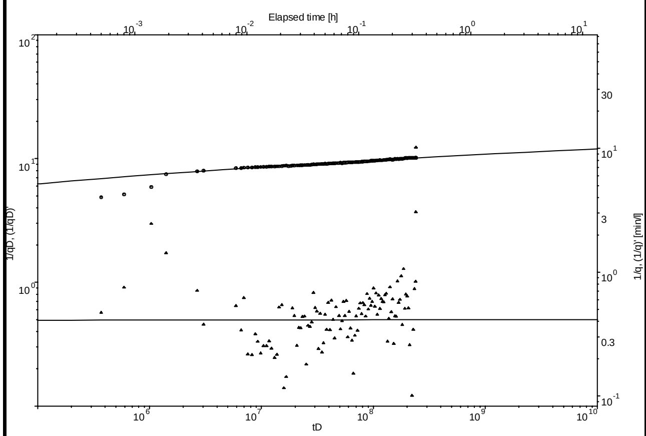
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060821 20:20
Test section from - to (m):	384.00-389.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

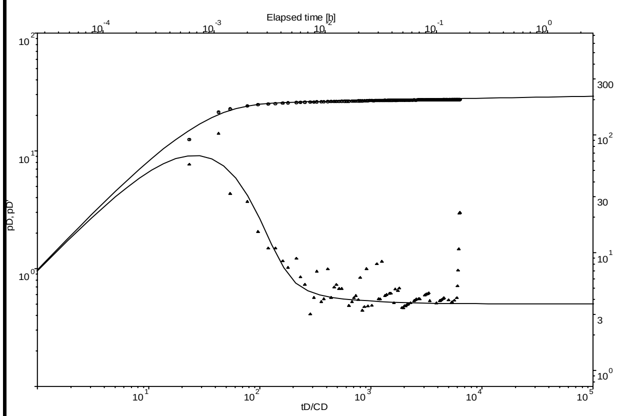


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3776		
p_i (kPa) =	3772		
p_p(kPa) =	3971	p_F (kPa) =	3768
Q_p (m^3/s)=	2.00E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.6		
Derivative fact.=	0.03	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	9.9E-08		
T_M (m^2/s)=	8.1E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.24	dt_1 (min) =	0.42
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	1.6E-07	T (m^2/s) =	4.5E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.2E-08	K_s (m/s) =	9.0E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.7E-11
C_D (-) =	NA	C_D (-) =	3.0E-03
ξ (-) =	3.77	ξ (-) =	21.30
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) =	0.42	C (m^3/Pa) =	2.7E-11
dt_2 (min) =	9.00	C_D (-) =	3.0E-03
T_T (m^2/s) =	4.5E-07	ξ (-) =	21.30
S (-) =	1.0E-06		
K_s (m/s) =	9.0E-08		
S_s (1/m) =	2.0E-07		

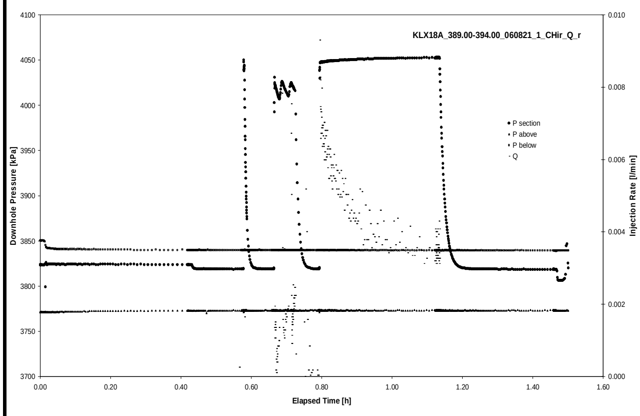
Comments:

The recommended transmissivity of 4.5E-7 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 1E-7 m2/s to 9E-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 3,769.1 kPa.

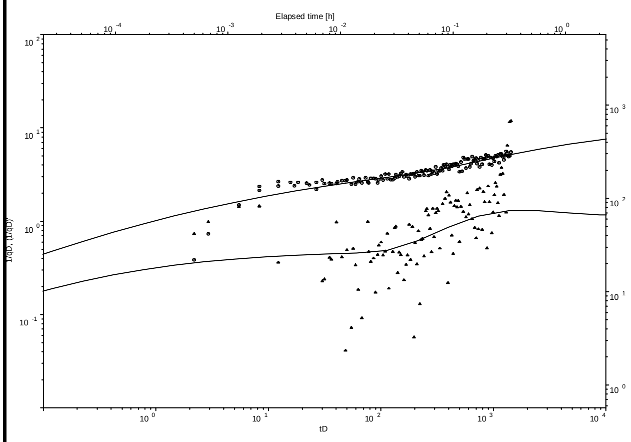
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060821 22:03
Test section from - to (m):	389.00-394.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

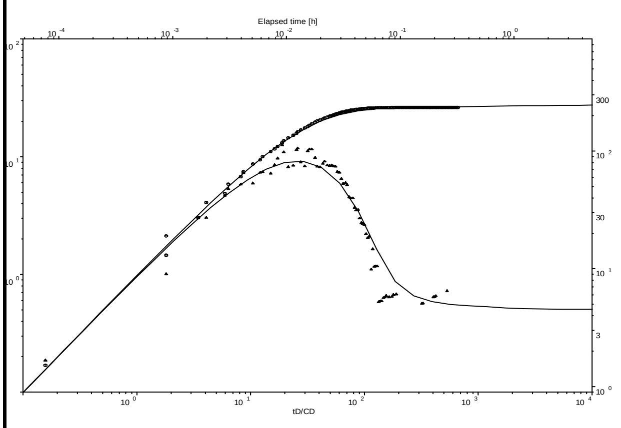
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3823		
p_i (kPa) =	3820		
p_p(kPa) =	4052	p_F (kPa) =	3818
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)=	12.7		
Derivative fact.=	0.15	Derivative fact.=	0.02
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) =	0.18	dt_1 (min) =	3.60
dt_2 (min) =	1.80	dt_2 (min) =	9.00
T (m^2/s) =	2.0E-09	T (m^2/s) =	1.3E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.9E-10	K_s (m/s) =	2.6E-09
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.5E-11
C_D (-) =	NA	C_D (-) =	1.6E-03
ξ (-) =	-0.06	ξ (-) =	21.60
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) =	0.18	C (m^3/Pa) =	1.5E-11
dt_2 (min) =	1.80	C_D (-) =	1.6E-03
T_T (m^2/s) =	2.0E-09	ξ (-) =	-0.06
S (-) =	1.0E-06		
K_s (m/s) =	3.9E-10		
S_s (1/m) =	2.0E-07		

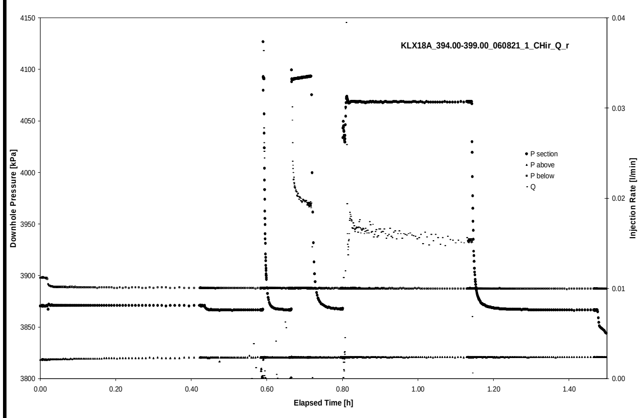
Comments:

The recommended transmissivity of 2.0E-9 m2/s was derived from the analysis of the CHi phase (inner zone), which shows a slight better derivative quality. The confidence range for the interval transmissivity is estimated to be 9E-10 m2/s to 1E-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 3,817.3 kPa.

Test Summary Sheet

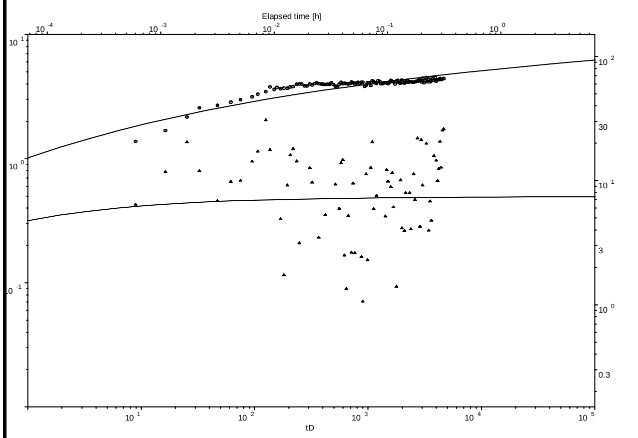
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060821 23:58
Test section from - to (m):	394.00-399.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

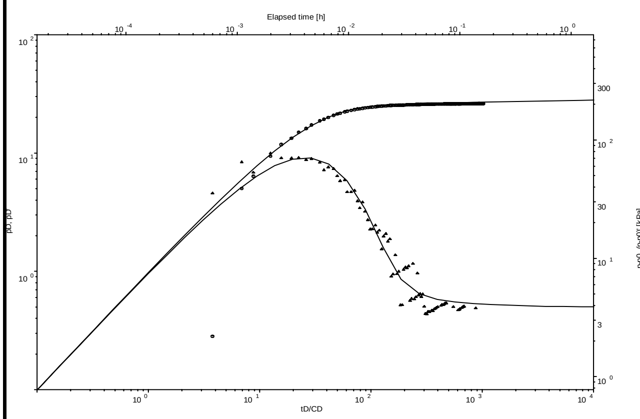


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3870		
p_i (kPa) =	3868		
p_p(kPa) =	4068	p_F (kPa) =	3867
Q_p (m^3/s)=	2.50E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.8		
Derivative fact.=	0.04	Derivative fact.=	0.02
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) =	0.72	dt_1 (min) =	1.80
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	8.7E-09	T (m^2/s) =	5.5E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.7E-09	K_s (m/s) =	1.1E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.0E-11
C_D (-) =	NA	C_D (-) =	2.2E-03
ξ (-) =	-0.19	ξ (-) =	21.50
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) =	1.80	C (m^3/Pa) =	2.0E-11
dt_2 (min) =	9.00	C_D (-) =	2.2E-03
T_T (m^2/s) =	5.5E-08	ξ (-) =	21.50
S (-) =	1.0E-06		
K_s (m/s) =	1.1E-08		
S_s (1/m) =	2.0E-07		

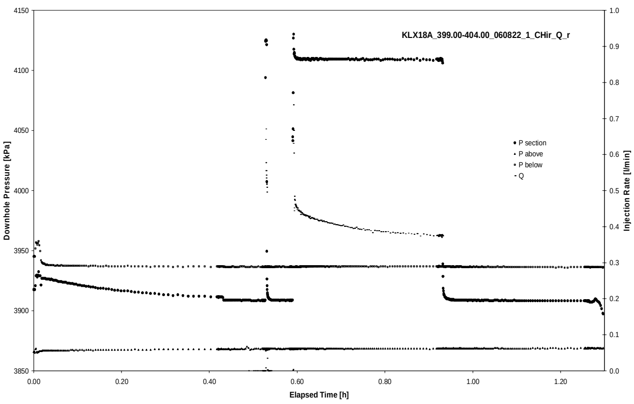
Comments:

The recommended transmissivity of 5.5E-8 m2/s was derived from the analysis of the CHir phase, because of the slight stabilization of the derivative. The confidence range for the interval transmissivity is estimated to be 1E-8 m2/s to 8E-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 3,865.8 kPa.

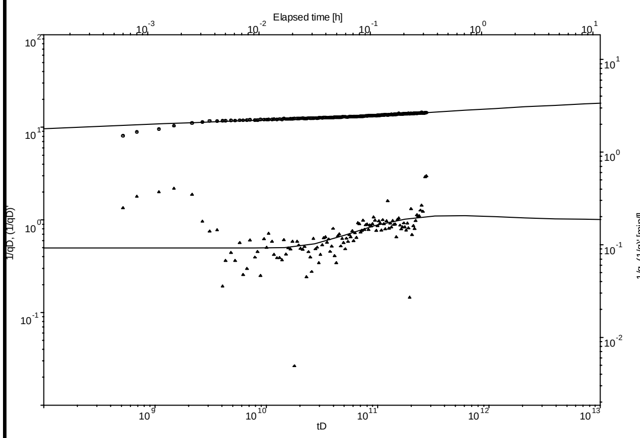
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060822 06:19
Test section from - to (m):	399.00-404.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

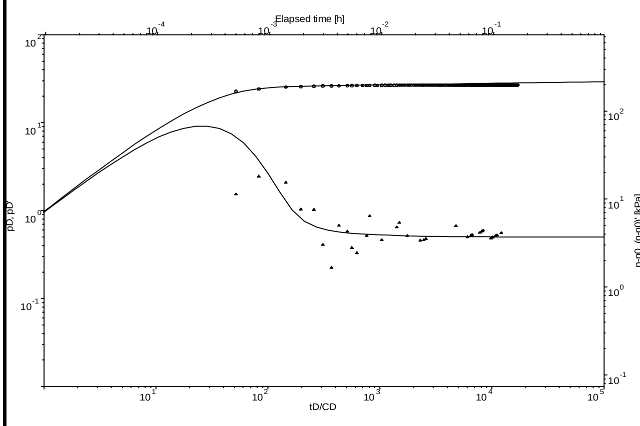
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3918		
p_i (kPa) =	3909		
p_p(kPa) =	4109	p_F (kPa) =	3908
Q_p (m^3/s)=	6.28E-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)=	12.8		
Derivative fact.=	0.09	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	3.1E-07		
T_M (m^2/s)=	2.5E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.30	dt_1 (min) =	0.18
dt_2 (min) =	2.40	dt_2 (min) =	9.00
T (m^2/s) =	7.0E-07	T (m^2/s) =	1.4E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.4E-07	K_s (m/s) =	2.8E-07
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.1E-11
C_D (-) =	NA	C_D (-) =	3.4E-03
ξ (-) =	6.55	ξ (-) =	21.30
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) =	0.30	C (m^3/Pa) =	3.1E-11
dt_2 (min) =	2.40	C_D (-) =	3.4E-03
T_T (m^2/s) =	7.0E-07	ξ (-) =	6.55
S (-) =	1.0E-06		
K_s (m/s) =	1.4E-07		
S_s (1/m) =	2.0E-07		

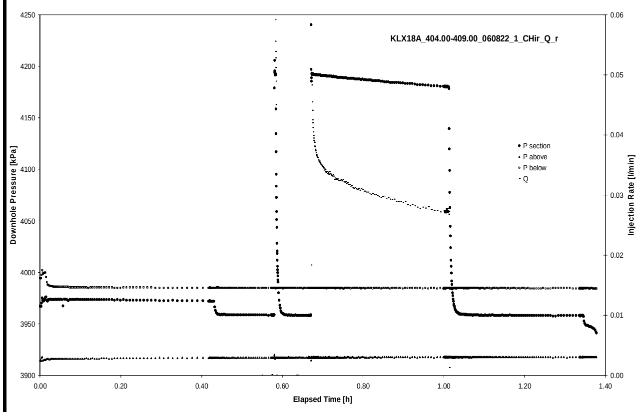
Comments:

The recommended transmissivity of 7.0E-7 m2/s was derived from the analysis of the CHi phase (inner zone), because it shows a better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 3E-7 m2/s to 1E-6 m2/s (this range includes the inner zone transmissivity of the CHi phase). 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 3,908.0 kPa.

Test Summary Sheet

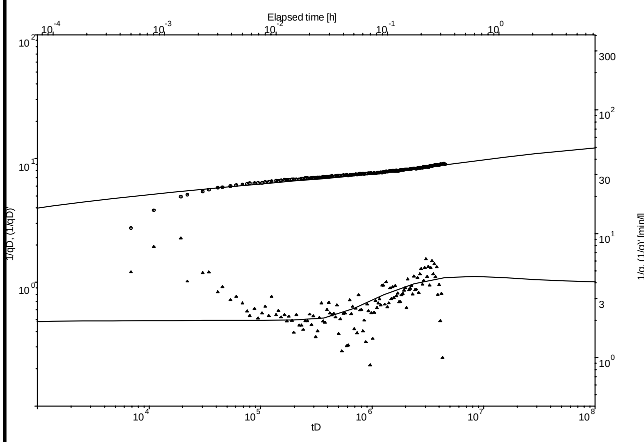
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060822 08:10
Test section from - to (m):	404.00-409.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

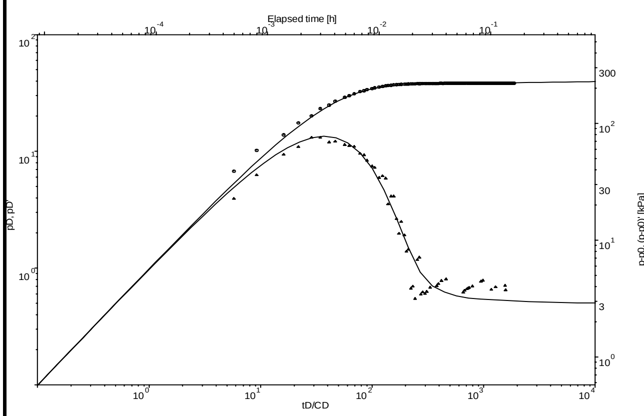


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	3970		
p_i (kPa) =	3958		
p_p(kPa) =	4181	p_F (kPa) =	3958
Q_p (m^3/s)=	4.55E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	12.9		
Derivative fact.=	0.08	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.0E-08		
T_M (m^2/s)=	1.7E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.30	dt_1 (min) =	1.20
dt_2 (min) =	1.80	dt_2 (min) =	9.00
T (m^2/s) =	2.9E-08	T (m^2/s) =	1.4E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.8E-09	K_s (m/s) =	2.8E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.8E-11
C_D (-) =	NA	C_D (-) =	3.1E-03
ξ (-) =	2.63	ξ (-) =	32.80
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) =	0.30	C (m^3/Pa) =	2.8E-11
dt_2 (min) =	1.80	C_D (-) =	3.1E-03
T_T (m^2/s) =	2.9E-08	ξ (-) =	2.63
S (-) =	1.0E-06		
K_s (m/s) =	5.8E-09		
S_s (1/m) =	2.0E-07		

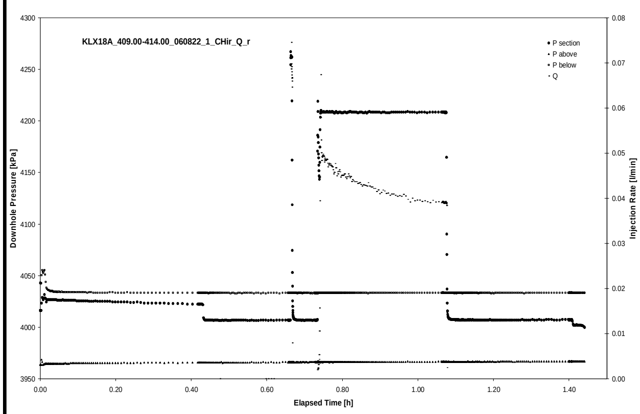
Comments:

The recommended transmissivity of 2.9E-8 m2/s was derived from the analysis of the CHi phase (inner zone), because of its better data quality. The confidence range for the interval transmissivity is estimated to be 9E-9 m2/s to 5E-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 3,957.7 kPa.

Test Summary Sheet

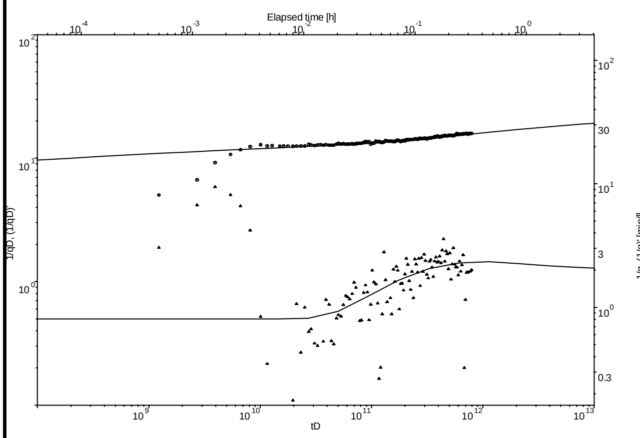
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060822 10:09
Test section from - to (m):	409.00-414.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

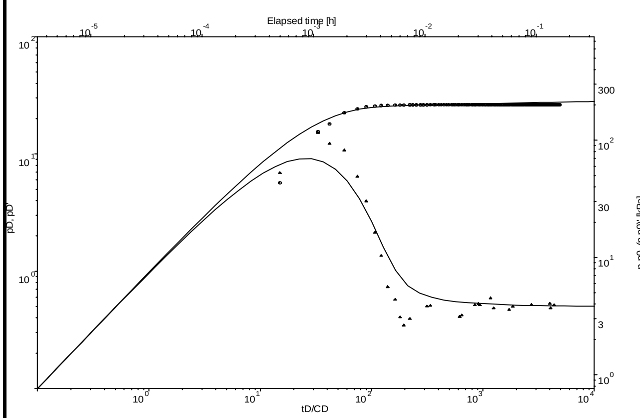


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4016		
p_i (kPa) =	4008		
p_p(kPa) =	4209	p_F (kPa) =	4008
Q_p (m^3/s)=	6.50E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13		
Derivative fact.=	0.11	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	3.2E-08		
T_M (m^2/s)=	2.6E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.24	dt_1 (min) =	0.30
dt_2 (min) =	1.80	dt_2 (min) =	9.00
T (m^2/s) =	8.0E-08	T (m^2/s) =	1.5E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.6E-08	K_s (m/s) =	2.9E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.1E-11
C_D (-) =	NA	C_D (-) =	1.2E-03
ξ (-) =	8.16	ξ (-) =	21.80
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) =	0.24	C (m^3/Pa) =	1.1E-11
dt_2 (min) =	1.80	C_D (-) =	1.2E-03
T_T (m^2/s) =	8.0E-08	ξ (-) =	8.16
S (-) =	1.0E-06		
K_s (m/s) =	1.6E-08		
S_s (1/m) =	2.0E-07		

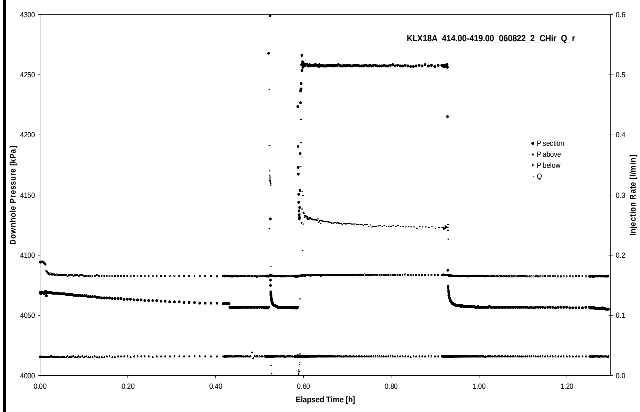
Comments:

The recommended transmissivity of 8.0E-8 m2/s was derived from the analysis of the CHi phase (inner zone), because it shows a better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5E-8 m2/s to 1E-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 4,006.8 kPa.

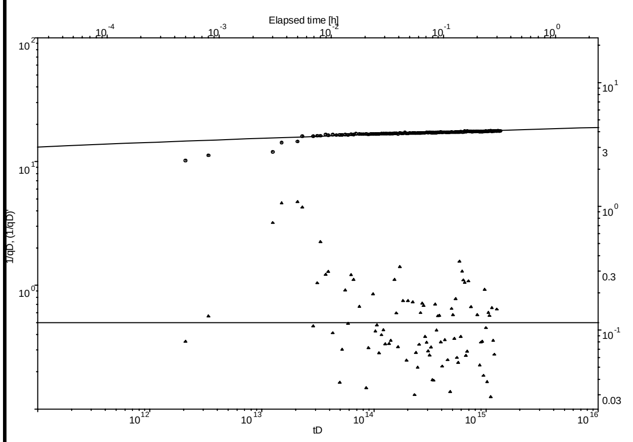
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060822 14:07
Test section from - to (m):	414.00-419.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

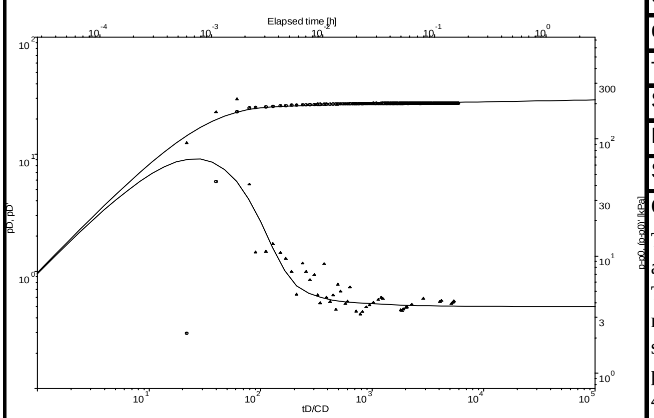
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4069		
p_i (kPa) =	4057		
p_p(kPa) =	4257	p_F (kPa) =	4057
Q_p (m^3/s)=	4.12E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.1		
Derivative fact.=	0.04	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.0E-07		
T_M (m^2/s)=	1.7E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.42	dt_1 (min) =	0.48
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	5.7E-07	T (m^2/s) =	8.8E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.1E-07	K_s (m/s) =	1.8E-07
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	5.6E-11
C_D (-) =	NA	C_D (-) =	6.2E-03
ξ (-) =	10.90	ξ (-) =	2.10
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) =	0.48	C (m^3/Pa) =	5.6E-11
dt_2 (min) =	9.00	C_D (-) =	6.2E-03
T_T (m^2/s) =	8.8E-07	ξ (-) =	2.10
S (-) =	1.0E-06		
K_s (m/s) =	0.0E+00		
S_s (1/m) =	0.0E+00		

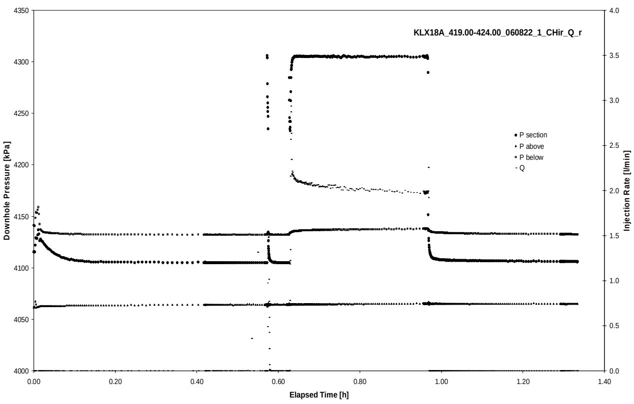
Comments:

The recommended transmissivity of 8.8E-7 m2/s was derived from the analysis of the CHir phase, which shows the better derivative stabilization. The confidence range for the interval transmissivity is estimated to be 4E-7 m2/s to 2E-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 4,055.8 kPa.

Test Summary Sheet

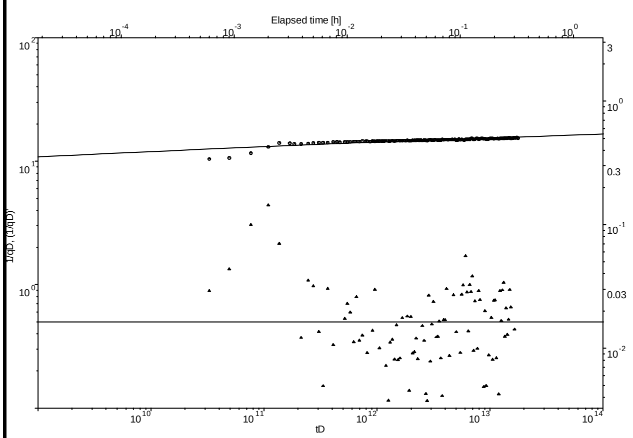
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060822 15:59
Test section from - to (m):	419.00-424.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

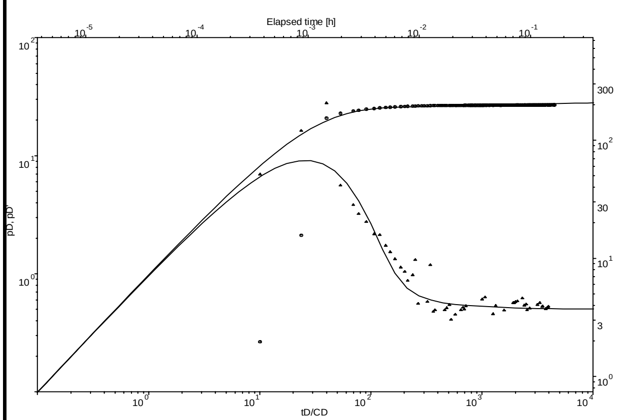


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4115		
p_i (kPa) =	4105		
p_p(kPa) =	4306	p_F (kPa) =	4106
Q_p (m^3/s)=	3.32E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.1		
Derivative fact.=	0.04	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.6E-06		
T_M (m^2/s)=	1.3E-06		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.24	dt_1 (min) =	0.54
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	4.0E-06	T (m^2/s) =	7.2E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	7.9E-07	K_s (m/s) =	1.4E-06
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.1E-10
C_D (-) =	NA	C_D (-) =	6.7E-02
ξ (-) =	7.76	ξ (-) =	19.80
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) =	0.54	C (m^3/Pa) =	6.1E-10
dt_2 (min) =	9.00	C_D (-) =	6.7E-02
T_T (m^2/s) =	7.2E-06	ξ (-) =	19.80
S (-) =	1.0E-06		
K_s (m/s) =	1.4E-06		
S_s (1/m) =	2.0E-07		

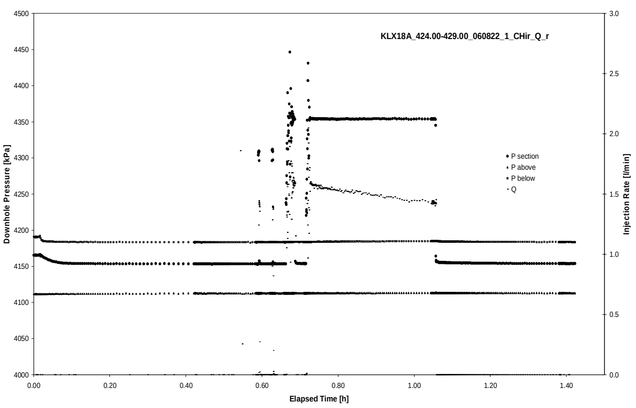
Comments:

The recommended transmissivity of 7.2E-6 m2/s was derived from the analysis of the CHir phase, which shows the better derivative stabilization. The confidence range for the interval transmissivity is estimated to be 3E-6 m2/s to 1E-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 4,105.4 kPa.

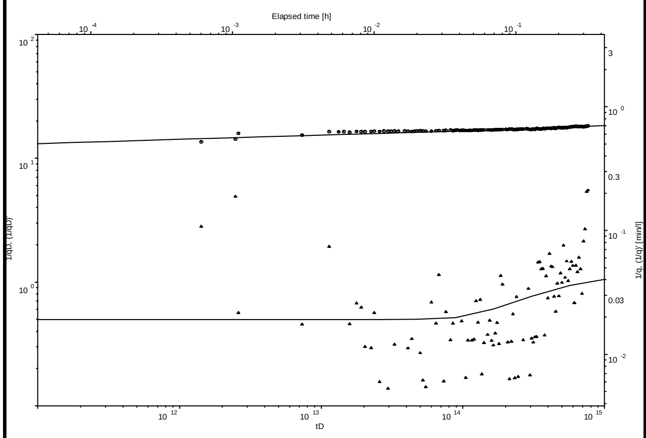
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060822 17:42
Test section from - to (m):	424.00-429.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

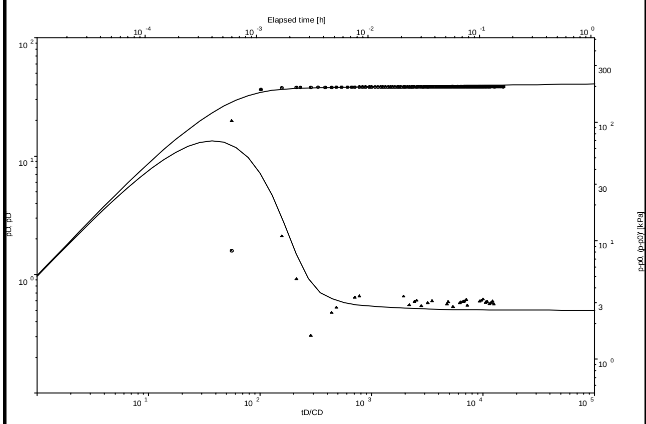
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4165		
p_i (kPa) =	4153		
p_p(kPa) =	4353	p_F (kPa) =	4153
Q_p (m^3/s)=	2.37E-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)=	13.2		
Derivative fact.=	0.05	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	1.2E-06		
T_M (m^2/s)=	9.6E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.36	dt_1 (min) =	0.27
dt_2 (min) =	2.40	dt_2 (min) =	9.00
T (m^2/s) =	3.4E-06	T (m^2/s) =	7.6E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	6.8E-07	K_s (m/s) =	1.5E-06
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.9E-10
C_D (-) =	NA	C_D (-) =	2.1E-02
ξ (-) =	9.73	ξ (-) =	31.90
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) =	0.36	C (m^3/Pa) =	1.9E-10
dt_2 (min) =	2.40	C_D (-) =	2.1E-02
T_T (m^2/s) =	3.4E-06	ξ (-) =	9.73
S (-) =	1.0E-06		
K_s (m/s) =	6.8E-07		
S_s (1/m) =	2.0E-07		

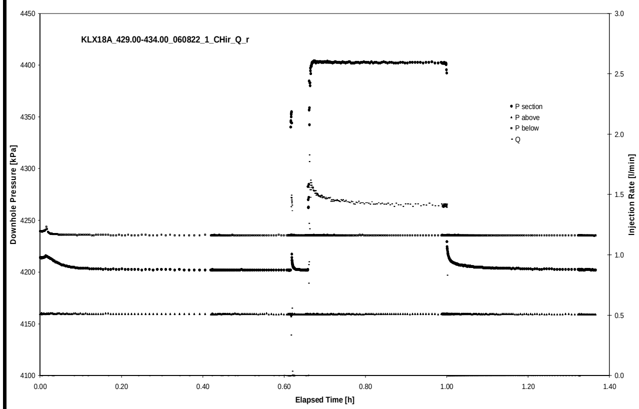
Comments:

The recommended transmissivity of 3.4E-6 m2/s was derived from the analysis of the CHi phase (inner zone), which shows the slight better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 5E-7 m2/s to 7E-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 4,153.3 kPa.

Test Summary Sheet

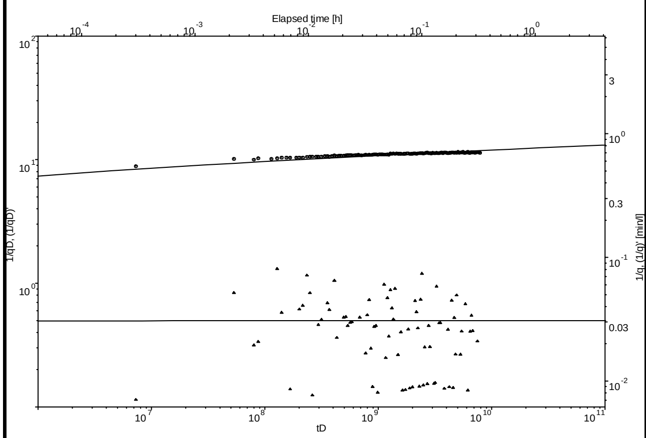
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060822 19:32
Test section from - to (m):	429.00-434.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

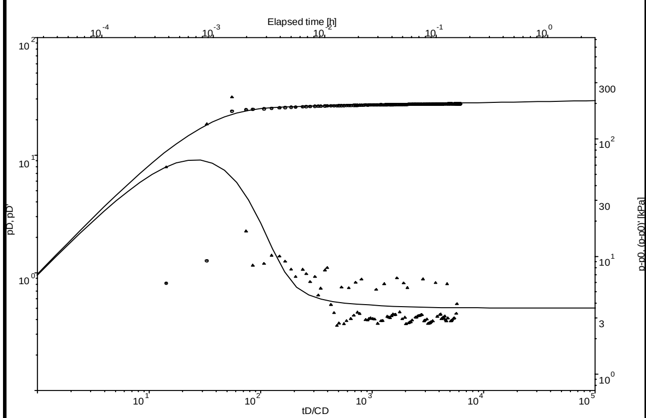


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4214		
p_i (kPa) =	4202		
p_p(kPa) =	4402	p_F (kPa) =	4202
Q_p (m^3/s)=	2.35E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.3		
Derivative fact.=	0.04	Derivative fact.=	0.03
Results		**Results**	
Q/s (m^2/s)=	1.2E-06		
T_M (m^2/s)=	9.5E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.30	dt_1 (min) =	0.60
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	2.1E-06	T (m^2/s) =	5.2E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	4.2E-07	K_s (m/s) =	1.0E-06
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.2E-10
C_D (-) =	NA	C_D (-) =	3.5E-02
ξ (-) =	4.22	ξ (-) =	20.10
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) =	0.60	C (m^3/Pa) =	3.2E-10
dt_2 (min) =	9.00	C_D (-) =	3.5E-02
T_T (m^2/s) =	5.2E-06	ξ (-) =	20.10
S (-) =	1.0E-06		
K_s (m/s) =	1.0E-06		
S_s (1/m) =	2.0E-07		

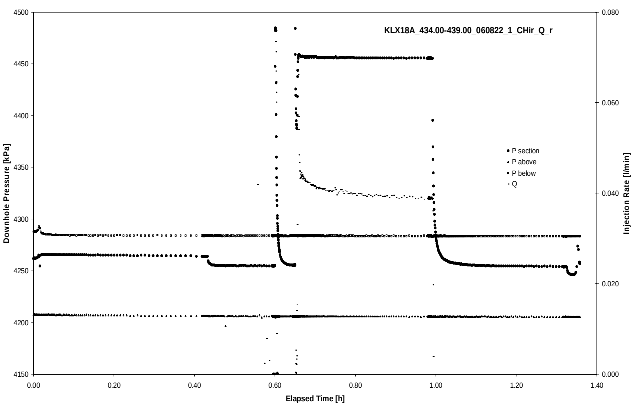
Comments:

The recommended transmissivity of 5.2E-6 m2/s was derived from the analysis of the CHir phase, because of its horizontal derivative stabilization at late times. The confidence range for the interval transmissivity is estimated to be 8E-7 m2/s to 9E-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 4,200.4 kPa.

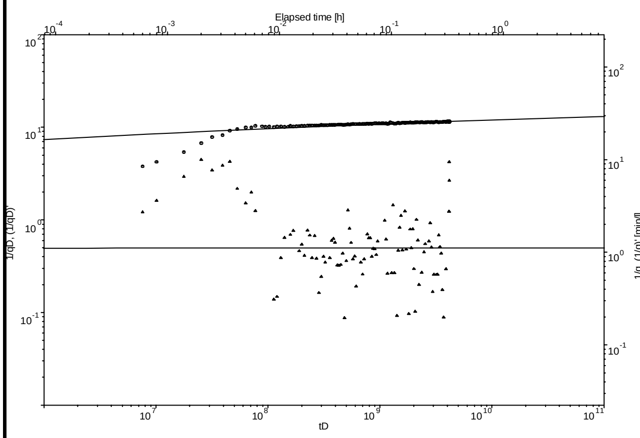
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060822 21:24
Test section from - to (m):	434.00-439.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

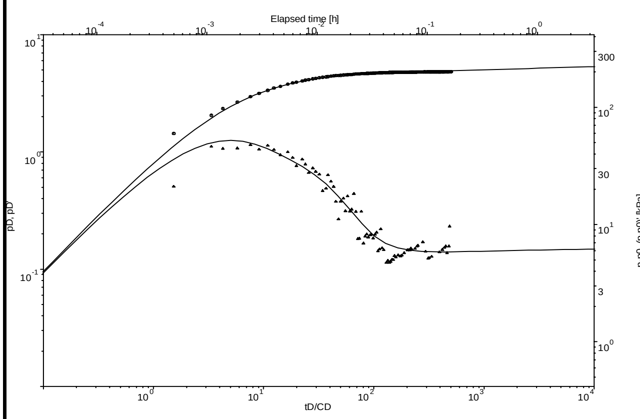
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4262		
p_i (kPa) =	4256		
p_p(kPa) =	4455	p_F (kPa) =	4254
Q_p (m^3/s)=	6.50E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.4		
Derivative fact.=	0.04	Derivative fact.=	0.01
Results		**Results**	
Q/s (m^2/s)=	3.2E-08		
T_M (m^2/s)=	2.6E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.60	dt_1 (min) =	0.27
dt_2 (min) =	18.00	dt_2 (min) =	0.90
T (m^2/s) =	5.8E-08	T (m^2/s) =	2.6E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.2E-08	K_s (m/s) =	5.1E-09
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.9E-11
C_D (-) =	NA	C_D (-) =	2.1E-03
ξ (-) =	5.70	ξ (-) =	0.80
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) =	0.27	C (m^3/Pa) =	1.9E-11
dt_2 (min) =	0.90	C_D (-) =	2.1E-03
T_T (m^2/s) =	2.6E-08	ξ (-) =	0.80
S (-) =	1.0E-06		
K_s (m/s) =	5.1E-09		
S_s (1/m) =	2.0E-07		

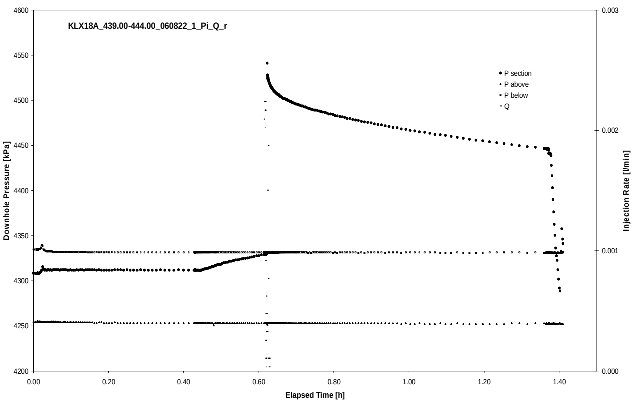
Comments:

The recommended transmissivity of 2.6E-8 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 9E-9 m2/s to 6E-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 4,250.3 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060822 23:10
Test section from - to (m):	439.00-444.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

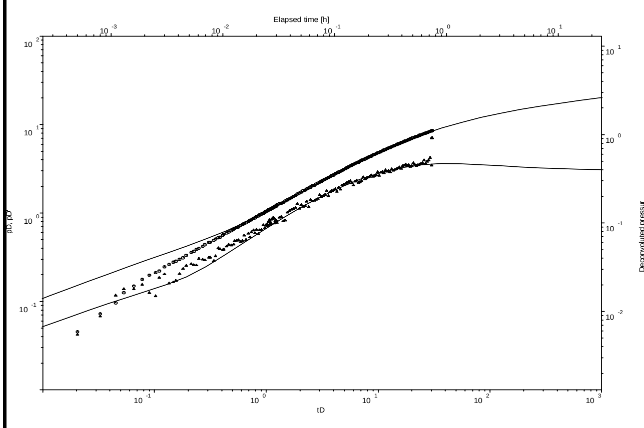


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4308		
p_i (kPa) =	4330		
p_p(kPa) =	4541	p_F (kPa) =	4445
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	2694
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.5		
Derivative fact.=	NA	Derivative fact.=	0.04
Results		**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) =	0.30
dt_2 (min) =	NA	dt_2 (min) =	1.80
T (m^2/s) =	NA	T (m^2/s) =	6.2E-11
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	1.2E-11
S_s (1/m) =	NA	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 (-) =	NA	ξ (-) =	5.10
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0.30	C (m^3/Pa) =	1.8E-11
dt_2 (min) =	1.80	C_D (-) =	2.0E-03
T_T (m^2/s) =	6.2E-11	ξ (-) =	5.10
S (-) =	1.0E-06		
K_s (m/s) =	1.2E-11		
S_s (1/m) =	2.0E-07		

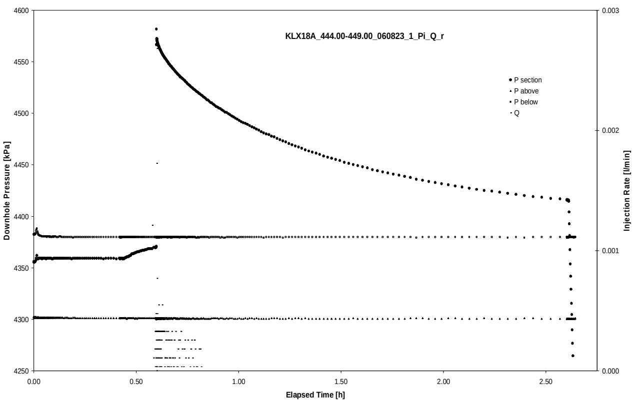
Comments:

The recommended transmissivity of 6.2•10-11 m2/s was derived from the analysis of the Pi phase (inner zone). The confidence range for the interval transmissivity is estimated to be 1.0•10-11 to 9.0•10-11 m2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060823 01:02
Test section from - to (m):	444.00-449.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

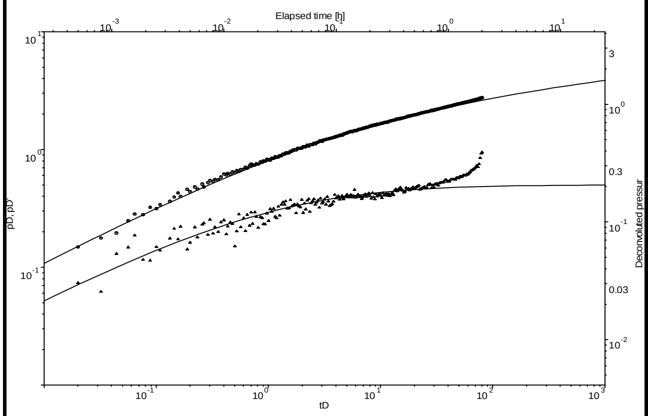


Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4356		
p_i (kPa) =	4371		
p_p(kPa) =	4573	p_F (kPa) =	4416
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	7234
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.6		
Derivative fact.=	NA	Derivative fact.=	0.1
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	0.12
dt_2 (min) =	NA	dt_2 (min) =	42.00
T (m^2/s) =	NA	T (m^2/s) =	1.0E-11
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	2.1E-12
S_s (1/m) =	NA	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	9.9E-12
C_D (-) =	NA	C_D (-) =	1.1E-03
ξ (-) =	NA	ξ (-) =	0.22
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0.12	C (m^3/Pa) =	9.9E-12
dt_2 (min) =	42.00	C_D (-) =	1.1E-03
T_T (m^2/s) =	1.0E-11	ξ (-) =	0.22
S (-) =	1.0E-06		
K_s (m/s) =	2.1E-12		
S_s (1/m) =	2.0E-07		

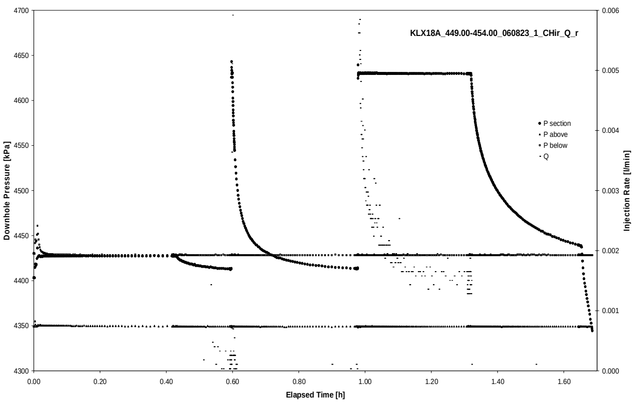
Comments:

The recommended transmissivity of 1.0E-11 m2/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 7E-12 to 3E-11 m2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

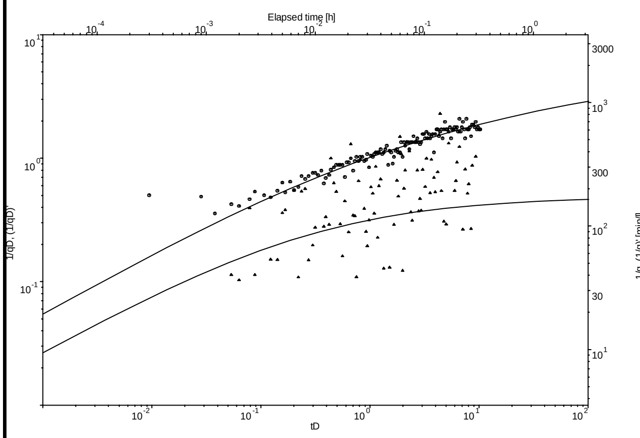
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060823 06:23
Test section from - to (m):	449.00-454.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

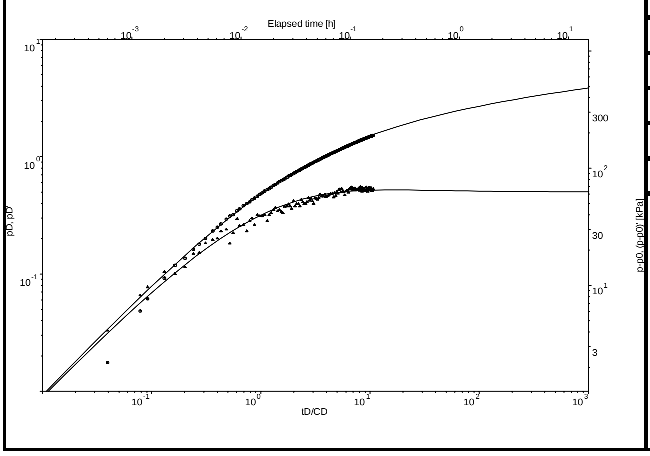
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4403		
p_i (kPa) =	4413		
p_p(kPa) =	4630	p_F (kPa) =	4439
Q_p (m^3/s)=	2.63E-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)=	13.7		
Derivative fact.=	0.05	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.2E-09		
T_M (m^2/s)=	9.8E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.54	dt_1 (min) =	0.60
dt_2 (min) =	15.00	dt_2 (min) =	9.00
T (m^2/s) =	3.7E-10	T (m^2/s) =	4.2E-10
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	7.3E-11	K_s (m/s) =	8.4E-11
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.5E-11
C_D (-) =	NA	C_D (-) =	1.6E-03
ξ (-) =	-1.69	ξ (-) =	-1.39
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) =	0.60	C (m^3/Pa) =	1.5E-11
dt_2 (min) =	9.00	C_D (-) =	1.6E-03
T_T (m^2/s) =	4.2E-10	ξ (-) =	-1.39
S (-) =	1.0E-06		
K_s (m/s) =	8.4E-11		
S_s (1/m) =	2.0E-07		

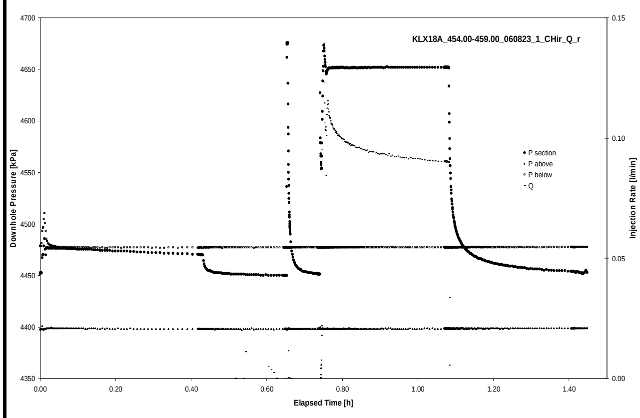
Comments:

The recommended transmissivity of 4.2E-10 m2/s was derived from the analysis of the CHir phase, because of its better data quality. The confidence range for the interval transmissivity is estimated to be 1E-10 m2/s to 7E-10 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 4,393.1 kPa.

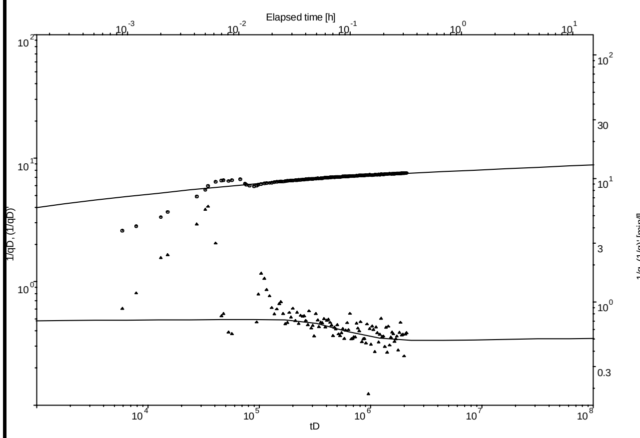
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060823 08:37
Test section from - to (m):	454.00-459.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

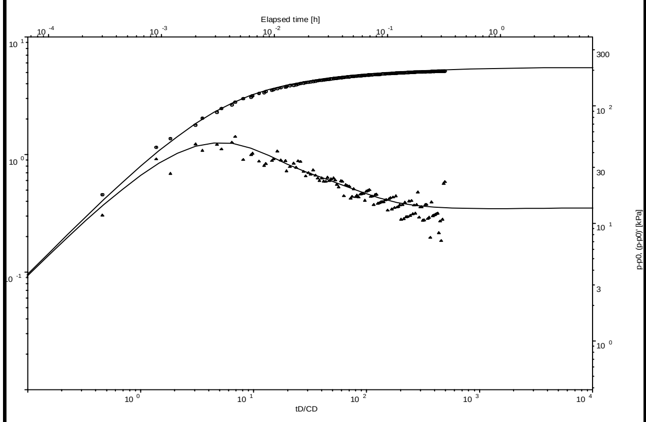
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4453		
p_i (kPa) =	4451		
p_p(kPa) =	4652	p_F (kPa) =	4454
Q_p (m^3/s)=	1.51E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	13.9		
Derivative fact.=	0.07	Derivative fact.=	0.04
Results		**Results**	
Q/s (m^2/s)=	7.3E-08		
T_M (m^2/s)=	6.1E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.20	dt_1 (min) =	0.36
dt_2 (min) =	3.60	dt_2 (min) =	1.80
T (m^2/s) =	8.9E-08	T (m^2/s) =	6.5E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.8E-08	K_s (m/s) =	1.3E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	9.8E-11
C_D (-) =	NA	C_D (-) =	1.1E-02
ξ (-) =	1.69	ξ (-) =	-0.03
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) =	0.36	C (m^3/Pa) =	9.8E-11
dt_2 (min) =	1.80	C_D (-) =	1.1E-02
T_T (m^2/s) =	6.5E-08	ξ (-) =	-0.03
S (-) =	1.0E-06		
K_s (m/s) =	1.3E-08		
S_s (1/m) =	2.0E-07		

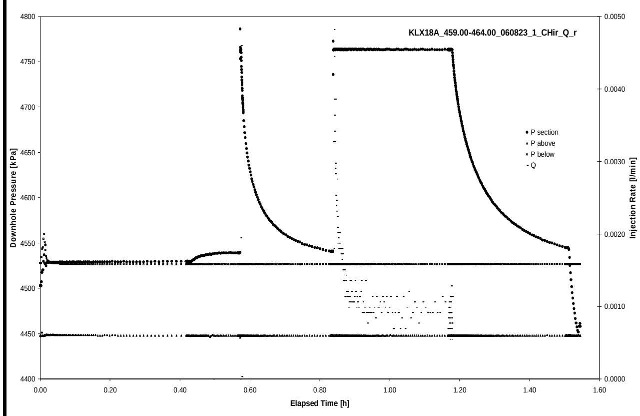
Comments:

The recommended transmissivity of 6.5E-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 3E-08 m2/s to 1E-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 4,445.1 kPa.

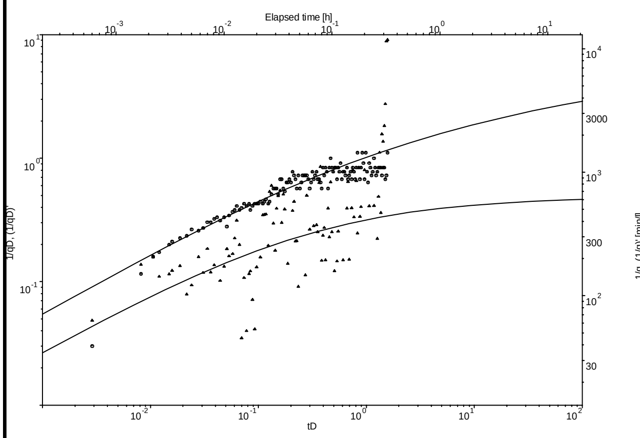
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060823 10:41
Test section from - to (m):	459.00-464.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

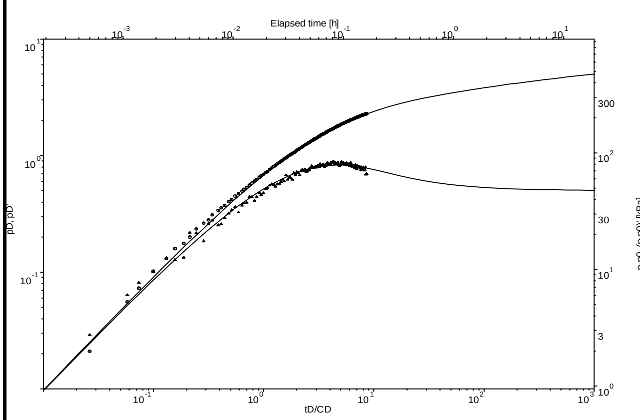
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4507		
p_i (kPa) =	4541		
p_p(kPa) =	4763	p_F (kPa) =	4545
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)=	13.8		
Derivative fact.=	0.08	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	7.4E-10		
T_M (m^2/s)=	6.1E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.21	dt_1 (min) =	0.54
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	9.0E-11	T (m^2/s) =	3.5E-10
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.8E-11	K_s (m/s) =	6.9E-11
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.5E-11
C_D (-) =	NA	C_D (-) =	1.7E-03
ξ (-) =	-1.92	ξ (-) =	-0.25
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) =	0.54	C (m^3/Pa) =	1.5E-11
dt_2 (min) =	9.00	C_D (-) =	1.7E-03
T_T (m^2/s) =	3.5E-10	ξ (-) =	-0.25
S (-) =	1.0E-06		
K_s (m/s) =	6.9E-11		
S_s (1/m) =	2.0E-07		

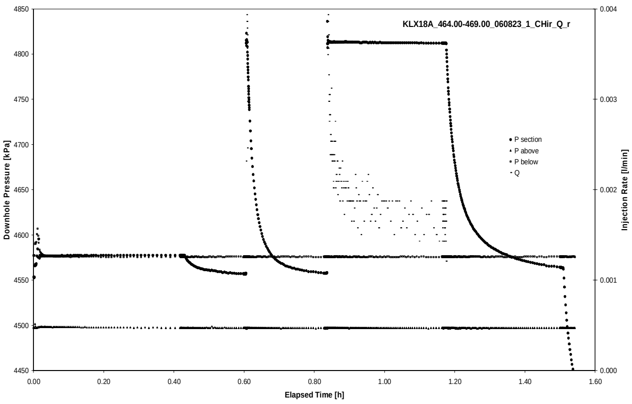
Comments:

The recommended transmissivity of 3.5E-10 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 9E-11 m2/s to 6E-10 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 4,492.0 kPa.

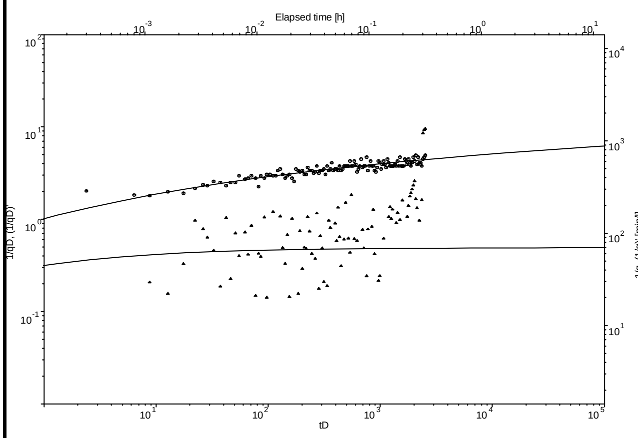
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060823 13:31
Test section from - to (m):	464.00-469.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

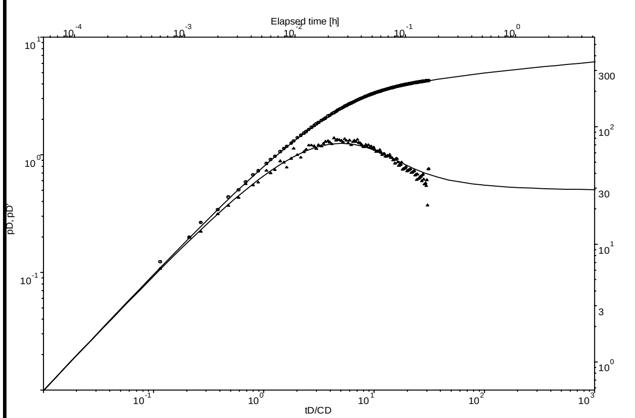
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4553		
p_i (kPa) =	4558		
p_p(kPa) =	4812	p_F (kPa) =	4564
Q_p (m^3/s)=	2.67E-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)=	13.9		
Derivative fact.=	0.13	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.0E-09		
T_M (m^2/s)=	8.5E-10		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.18	dt_1 (min) =	1.80
dt_2 (min) =	8.40	dt_2 (min) =	9.00
T (m^2/s) =	7.3E-10	T (m^2/s) =	7.6E-10
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.5E-10	K_s (m/s) =	1.5E-10
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	9.1E-12
C_D (-) =	NA	C_D (-) =	1.0E-03
ξ (-) =	0.74	ξ (-) =	1.16
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) =	1.80	C (m^3/Pa) =	9.1E-12
dt_2 (min) =	9.00	C_D (-) =	1.0E-03
T_T (m^2/s) =	7.6E-10	ξ (-) =	1.16
S (-) =	1.0E-06		
K_s (m/s) =	1.5E-10		
S_s (1/m) =	2.0E-07		

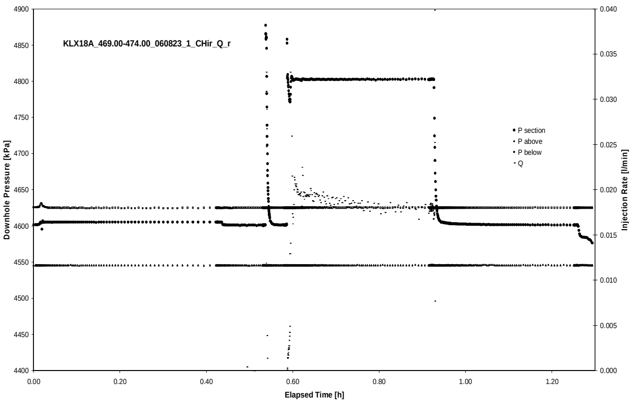
Comments:

The recommended transmissivity of 7.6E-10 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 4E-10 m2/s to 2E-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 4,538.1 kPa.

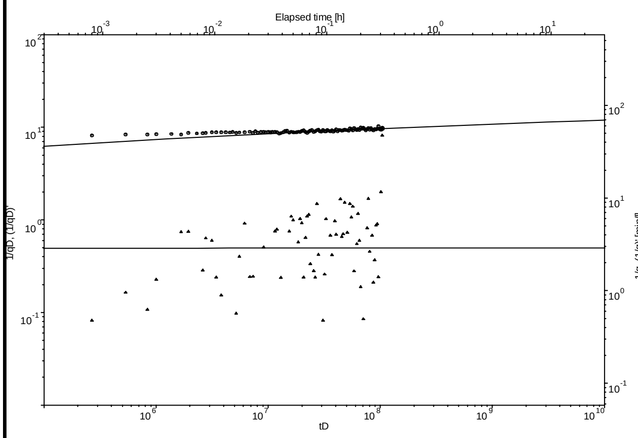
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060823 16:36
Test section from - to (m):	469.00-474.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

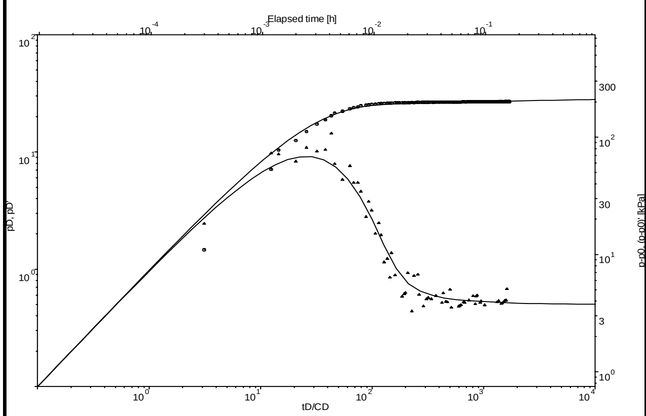
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4602		
p_i (kPa) =	4602		
p_p(kPa) =	4802	p_F (kPa) =	4601
Q_p (m^3/s)=	3.00E-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)=	14		
Derivative fact.=	0.08	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.5E-08		
T_M (m^2/s)=	1.2E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.30	dt_1 (min) =	1.20
dt_2 (min) =	15.00	dt_2 (min) =	9.00
T (m^2/s) =	2.2E-08	T (m^2/s) =	6.4E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	4.5E-09	K_s (m/s) =	1.3E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.4E-11
C_D (-) =	NA	C_D (-) =	1.6E-03
ξ (-) =	4.30	ξ (-) =	21.70
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) =	1.20	C (m^3/Pa) =	1.4E-11
dt_2 (min) =	9.00	C_D (-) =	1.6E-03
T_T (m^2/s) =	6.4E-08	ξ (-) =	21.70
S (-) =	1.0E-06		
K_s (m/s) =	1.3E-08		
S_s (1/m) =	2.0E-07		

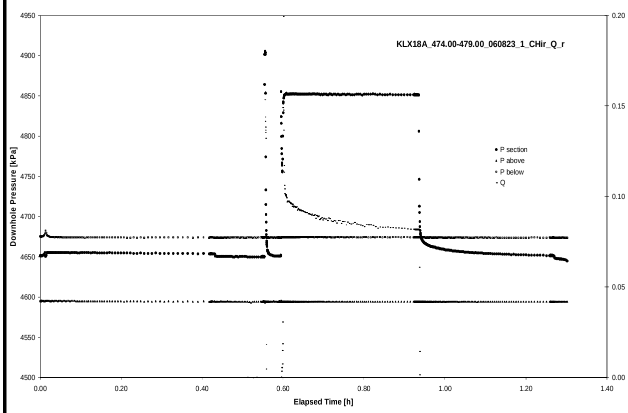
Comments:

The recommended transmissivity of 6.4E-8 m2/s was derived from the analysis of the CHir phase, which shows a horizontal stabilization of the derivative. The confidence range for the interval transmissivity is estimated to be 1E-8 m2/s to 9E-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 4,599.8 kPa.

Test Summary Sheet

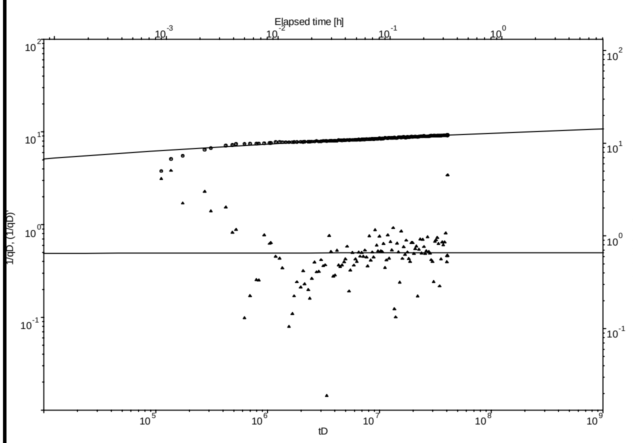
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060823 18:19
Test section from - to (m):	474.00-479.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

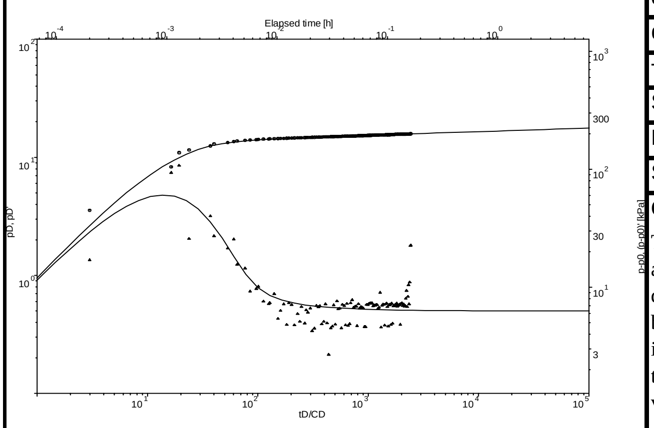


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4652		
p_i (kPa) =	4652		
p_p(kPa) =	4851	p_F (kPa) =	4651
Q_p (m^3/s)=	1.33E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.1		
Derivative fact.=	0.08	Derivative fact.=	0.04
Results		**Results**	
Q/s (m^2/s)=	6.6E-08		
T_M (m^2/s)=	5.4E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.48	dt_1 (min) =	0.42
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	9.9E-08	T (m^2/s) =	1.8E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.0E-08	K_s (m/s) =	3.6E-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-11
C_D (-) =	NA	C_D (-) =	3.1E-03
ξ (-) =	3.10	ξ (-) =	9.80
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) =	0.48	C (m^3/Pa) =	2.8E-11
dt_2 (min) =	18.00	C_D (-) =	3.1E-03
T_T (m^2/s) =	9.9E-08	ξ (-) =	3.10
S (-) =	1.0E-06		
K_s (m/s) =	2.0E-08		
S_s (1/m) =	2.0E-07		

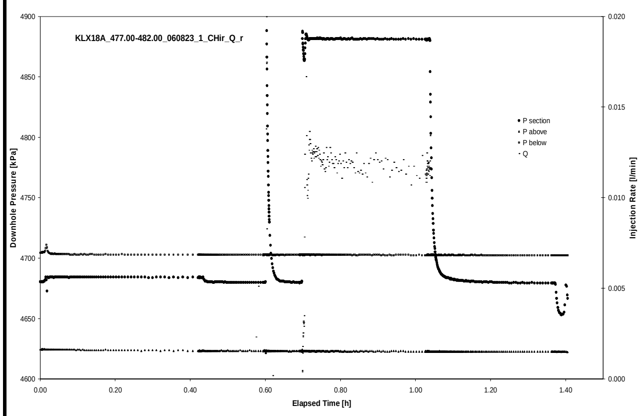
Comments:

The recommended transmissivity of 9.9E-8 m2/s was derived from the analysis of the CHi phase, which shows a slight better data and derivative quality. The confidence range for the interval transmissivity is estimated to be 7E-8 m2/s to 3E-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 4,647.4 kPa.

Test Summary Sheet

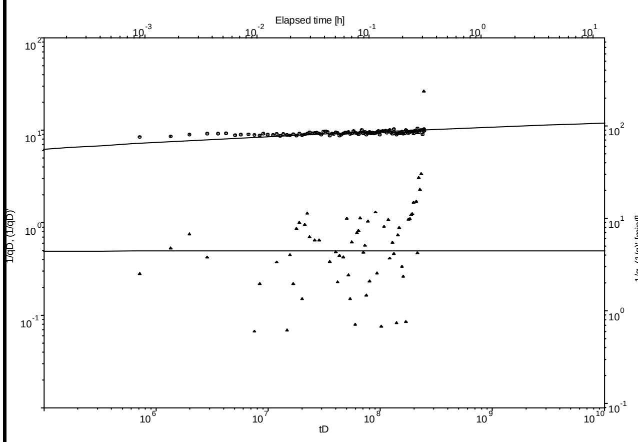
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060823 20:08
Test section from - to (m):	477.00-482.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

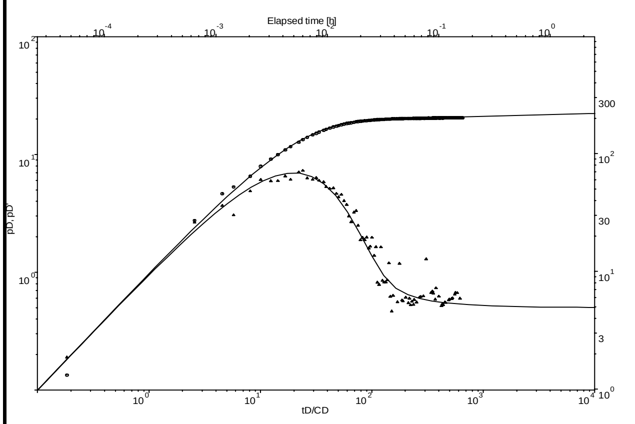


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4680		
p_i (kPa) =	4679		
p_p(kPa) =	4880	p_F (kPa) =	4679
Q_p (m^3/s)=	1.83E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.1		
Derivative fact.=	0.15	Derivative fact.=	0.01
Results		**Results**	
Q/s (m^2/s)=	8.9E-09		
T_M (m^2/s)=	7.4E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.20	dt_1 (min) =	1.80
dt_2 (min) =	15.00	dt_2 (min) =	9.00
T (m^2/s) =	1.5E-08	T (m^2/s) =	3.2E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.9E-09	K_s (m/s) =	6.3E-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 (-) =	5.00	ξ (-) =	15.80
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) =	1.80	C (m^3/Pa) =	1.8E-11
dt_2 (min) =	9.00	C_D (-) =	2.0E-03
T_T (m^2/s) =	3.2E-08	ξ (-) =	15.80
S (-) =	1.0E-06		
K_s (m/s) =	6.3E-09		
S_s (1/m) =	2.0E-07		

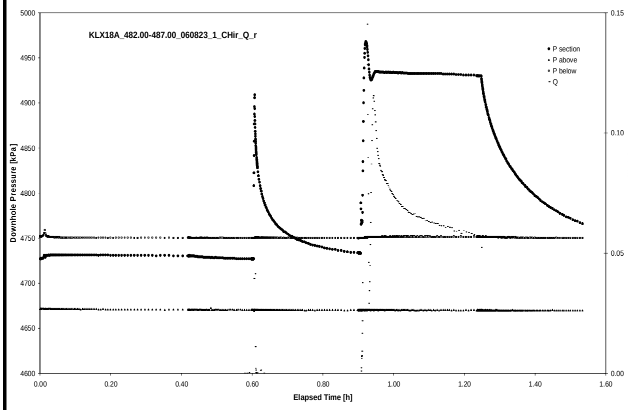
Comments:

The recommended transmissivity of 3.2E-8 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 7E-9 m2/s to 7E-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 4,676.0 kPa.

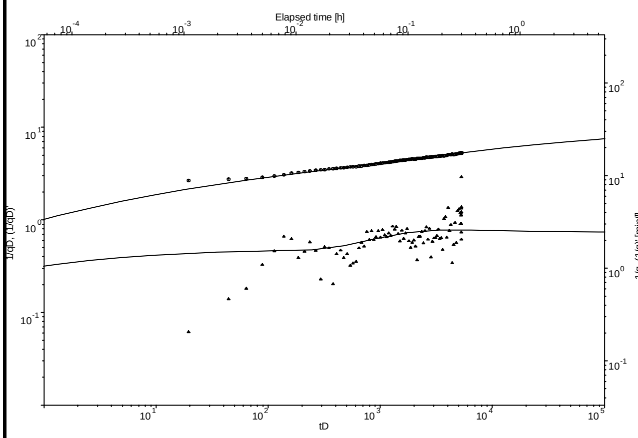
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060823 21:55
Test section from - to (m):	482.00-487.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

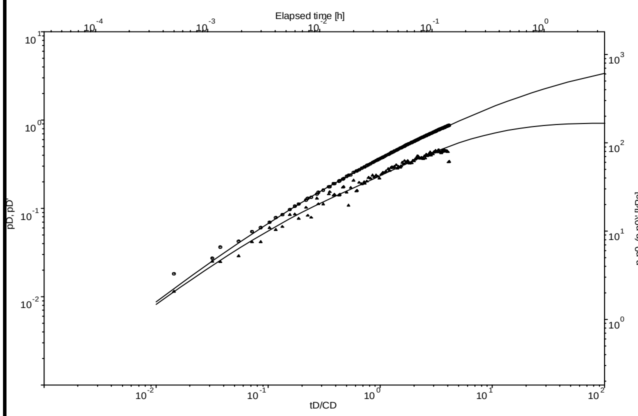
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4728		
p_i (kPa) =	4733		
p_p(kPa) =	4931	p_F (kPa) =	4679
Q_p (m^3/s)=	9.33E-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)=	14.2		
Derivative fact.=	0.03	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	4.6E-08		
T_M (m^2/s)=	3.8E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	4.20	dt_1 (min) =	1.80
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	2.6E-08	T (m^2/s) =	5.4E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.2E-09	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) =	7.7E-10
C_D (-) =	NA	C_D (-) =	8.5E-02
ξ (-) =	-0.90	ξ (-) =	-3.90
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) =	4.20	C (m^3/Pa) =	7.7E-10
dt_2 (min) =	18.00	C_D (-) =	8.5E-02
T_T (m^2/s) =	2.6E-08	ξ (-) =	-0.90
S (-) =	1.0E-06		
K_s (m/s) =	5.2E-09		
S_s (1/m) =	2.0E-07		

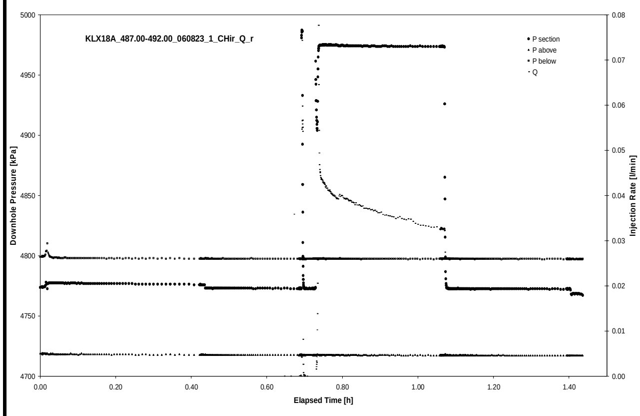
Comments:

The recommended transmissivity of 2.6E-8 m2/s was derived from the analysis of the CHi phase (outer zone), which shows the better data and derivative stabilization. The confidence range for the interval transmissivity is estimated to be 7E-9 m2/s to 5E-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 4,711.5 kPa.

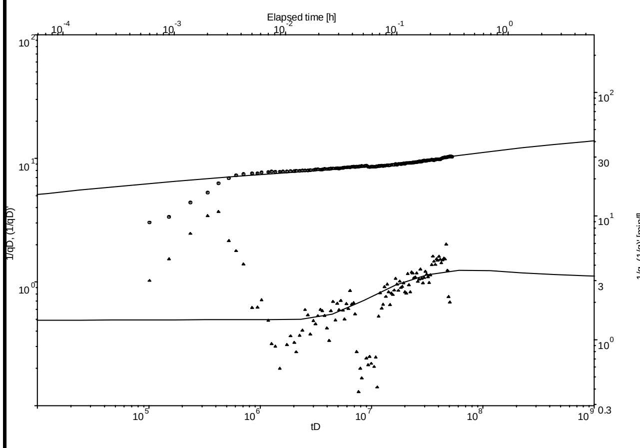
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060823 23:55
Test section from - to (m):	487.00-492.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

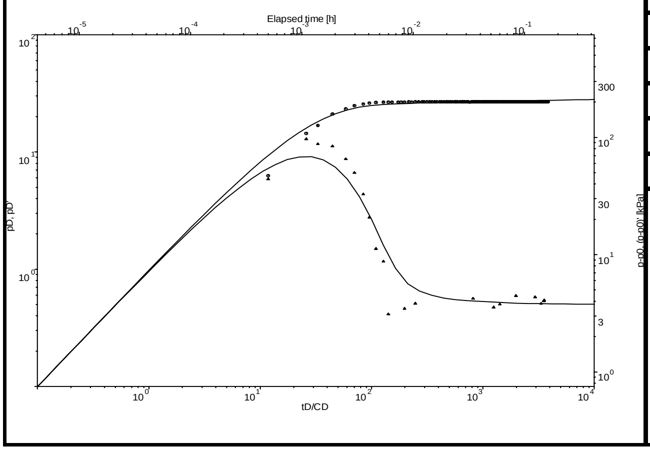
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4774		
p_i (kPa) =	4773		
p_p(kPa) =	4974	p_F (kPa) =	4772
Q_p (m^3/s)=	5.47E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.3		
Derivative fact.=	0.09	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	2.7E-08		
T_M (m^2/s)=	2.2E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.39	dt_1 (min) =	0.36
dt_2 (min) =	1.80	dt_2 (min) =	9.00
T (m^2/s) =	4.4E-08	T (m^2/s) =	1.3E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	8.8E-09	K_s (m/s) =	2.6E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.3E-11
C_D (-) =	NA	C_D (-) =	1.4E-03
ξ (-) =	3.67	ξ (-) =	21.70
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) =	0.39	C (m^3/Pa) =	1.3E-11
dt_2 (min) =	1.80	C_D (-) =	1.4E-03
T_T (m^2/s) =	4.4E-08	ξ (-) =	3.67
S (-) =	1.0E-06		
K_s (m/s) =	8.8E-09		
S_s (1/m) =	2.0E-07		

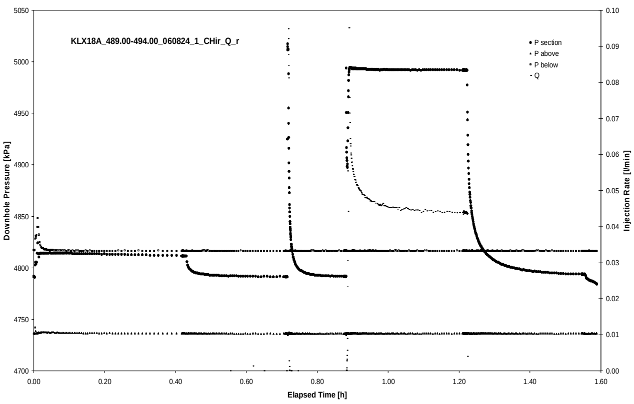
Comments:

The recommended transmissivity of 4.4E-8 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 1E-8 m2/s to 9E-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 4,772.5 kPa.

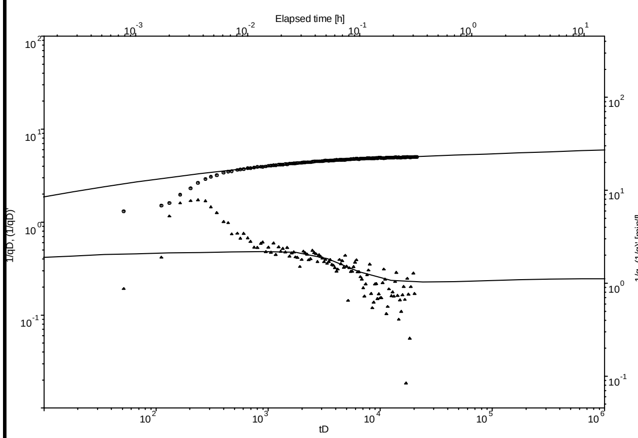
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060824 06:23
Test section from - to (m):	489.00-494.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

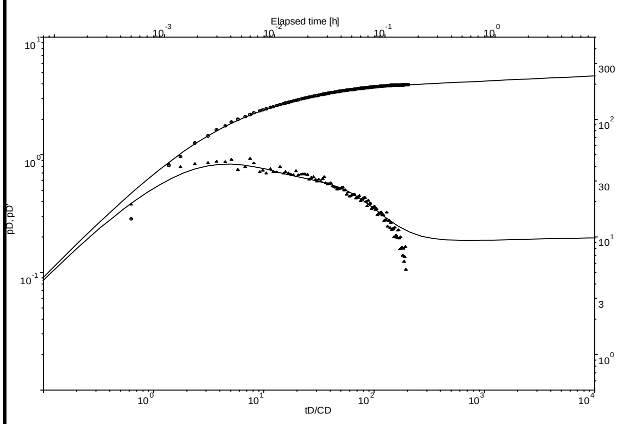
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	4791		
p_i (kPa) =	4792		
p_p(kPa) =	4992	p_F (kPa) =	4794
Q_p (m^3/s)=	7.32E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.3		
Derivative fact.=	0.09	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	3.6E-08		
T_M (m^2/s)=	3.0E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.60	dt_1 (min) =	0.48
dt_2 (min) =	2.40	dt_2 (min) =	2.40
T (m^2/s) =	2.9E-08	T (m^2/s) =	2.5E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.7E-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) =	4.5E-11
C_D (-) =	NA	C_D (-) =	5.0E-03
ξ (-) =	-0.04	ξ (-) =	-0.79
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) =	0.48	C (m^3/Pa) =	4.5E-11
dt_2 (min) =	2.40	C_D (-) =	5.0E-03
T_T (m^2/s) =	2.5E-08	ξ (-) =	-0.79
S (-) =	1.0E-06		
K_s (m/s) =	4.9E-09		
S_s (1/m) =	2.0E-07		

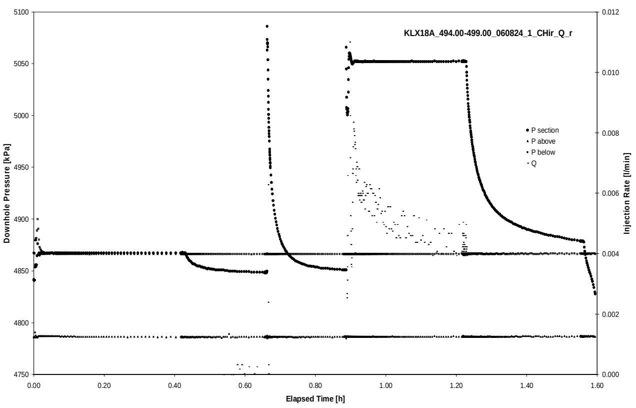
Comments:

The recommended transmissivity of 2.5E-8 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 9E-9 m2/s to 4E-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 4,790.3 kPa.

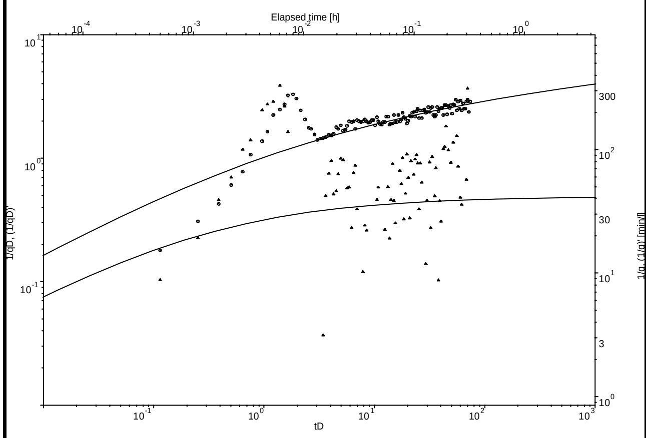
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060824 08:48
Test section from - to (m):	494.00-499.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

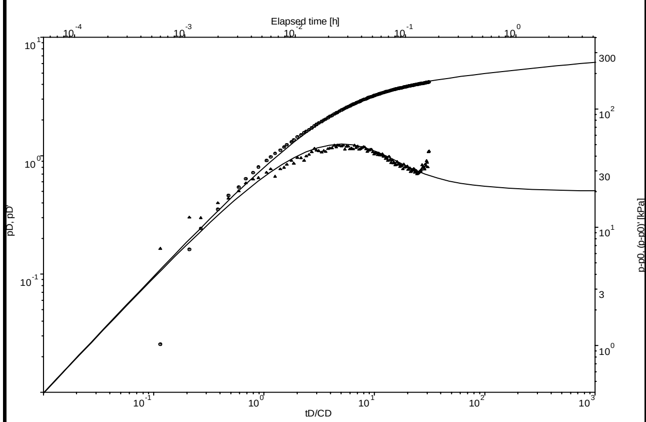
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4841		
p_i (kPa) =	4851		
p_p(kPa) =	5052	p_F (kPa) =	4878
Q_p (m^3/s)=	7.17E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.4		
Derivative fact.=	0.08	Derivative fact.=	0.04
Results		**Results**	
Q/s (m^2/s)=	3.5E-09		
T_M (m^2/s)=	2.9E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.90	dt_1 (min) =	2.40
dt_2 (min) =	15.00	dt_2 (min) =	9.00
T (m^2/s) =	1.5E-09	T (m^2/s) =	3.5E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.0E-10	K_s (m/s) =	6.9E-10
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	4.2E-11
C_D (-) =	NA	C_D (-) =	4.6E-03
ξ (-) =	-1.40	ξ (-) =	0.40
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) =	2.40	C (m^3/Pa) =	4.2E-11
dt_2 (min) =	9.00	C_D (-) =	4.6E-03
T_T (m^2/s) =	3.5E-09	ξ (-) =	0.40
S (-) =	1.0E-06		
K_s (m/s) =	6.9E-10		
S_s (1/m) =	2.0E-07		

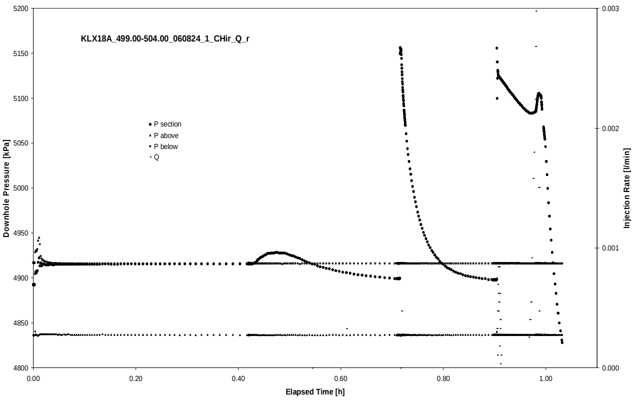
Comments:

The recommended transmissivity of 3.5E-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 1E-09 m2/s to 5E-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 4,857.9 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060824 11:04
Test section from - to (m):	499.00-504.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

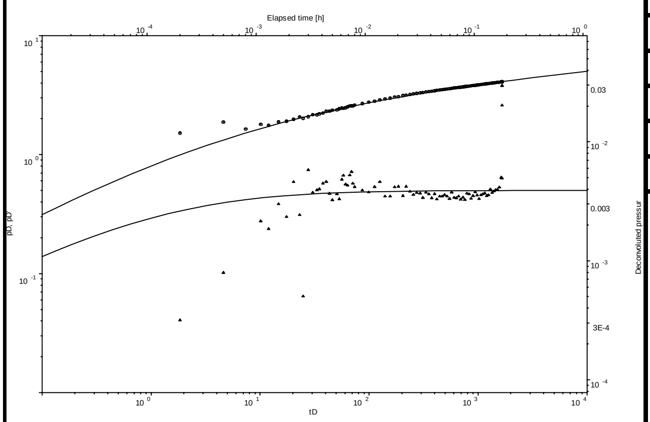


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4893		
p_i (kPa) =	4899		
p_p(kPa) =	5153	p_F (kPa) =	4898
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	678
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.5		
Derivative fact.=	NA	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	0.18
dt_2 (min) =	NA	dt_2 (min) =	10.20
T (m^2/s) =	NA	T (m^2/s) =	9.9E-11
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) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.8E-12
C_D (-) =	NA	C_D (-) =	2.0E-04
ξ (-) =	NA	ξ (-) =	1.81
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.			
dt_1 (min) =	0.18	C (m^3/Pa) =	1.8E-12
dt_2 (min) =	10.20	C_D (-) =	2.0E-04
T_T (m^2/s) =	9.9E-11	ξ (-) =	1.81
S (-) =	1.0E-06		
K_s (m/s) =	2.0E-11		
S_s (1/m) =	2.0E-07		

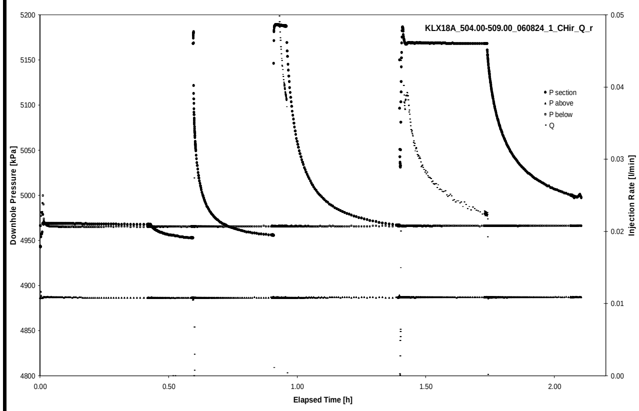
Comments:

The recommended transmissivity of 9.9E-11 m2/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 7E-11 to 2E-10 m2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

Test Summary Sheet

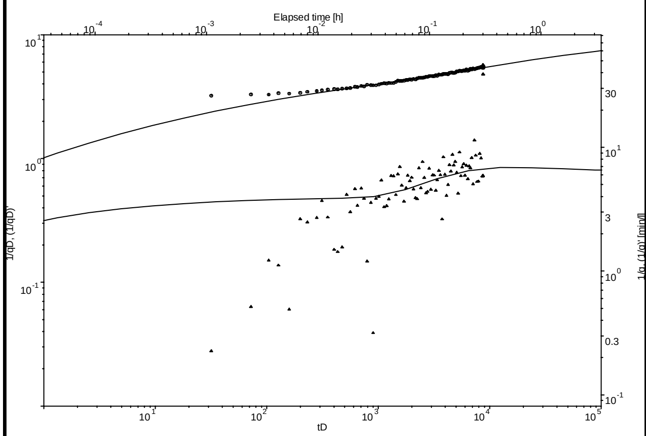
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060824 14:09
Test section from - to (m):	504.00-509.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

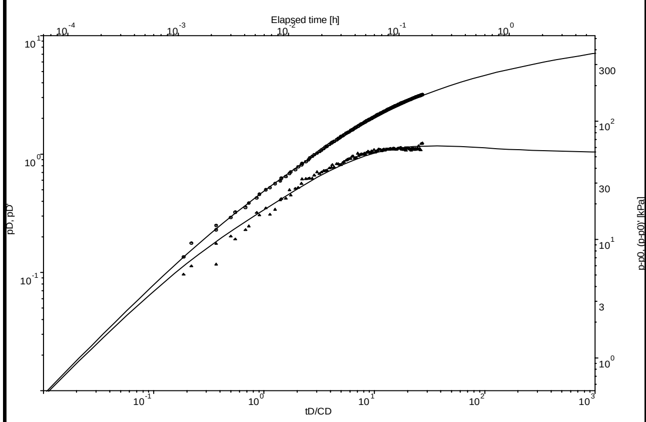


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4967		
p_i (kPa) =	4966		
p_p(kPa) =	5168	p_F (kPa) =	4998
Q_p (m^3/s)=	3.67E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.5		
Derivative fact.=	0.05	Derivative fact.=	0.07
Results		**Results**	
Q/s (m^2/s)=	1.8E-08		
T_M (m^2/s)=	1.5E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.60	dt_1 (min) =	0.30
dt_2 (min) =	2.40	dt_2 (min) =	1.20
T (m^2/s) =	1.6E-08	T (m^2/s) =	1.3E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.2E-09	K_s (m/s) =	2.6E-09
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.8E-10
C_D (-) =	NA	C_D (-) =	2.0E-02
ξ (-) =	-0.10	ξ (-) =	-2.60
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) =	0.60	C (m^3/Pa) =	1.8E-10
dt_2 (min) =	2.40	C_D (-) =	2.0E-02
T_T (m^2/s) =	1.6E-08	ξ (-) =	-0.10
S (-) =	1.0E-06		
K_s (m/s) =	3.2E-09		
S_s (1/m) =	2.0E-07		

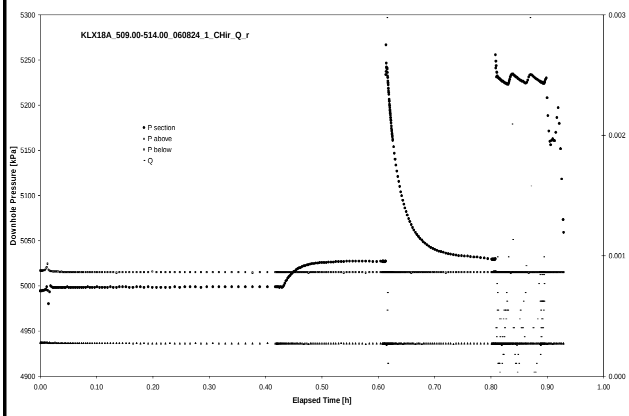
Comments:

The recommended transmissivity of 1.6E-8 m2/s was derived from the analysis of the CHi phase (inner zone). The confidence range for the interval transmissivity is estimated to be 8E-9 m2/s to 4E-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 4,959.6 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060824 16:44
Test section from - to (m):	509.00-514.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

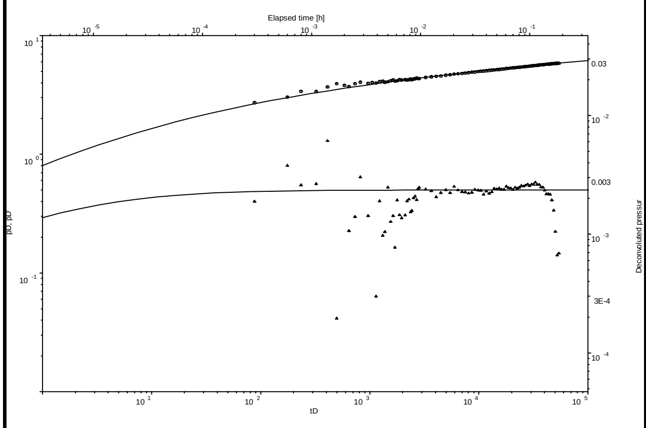


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	4995		
p_i (kPa) =	5027		
p_p(kPa) =	5240	p_F (kPa) =	5030
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	696
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.6		
Derivative fact.=	NA	Derivative fact.=	0.1
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	0.24
dt_2 (min) =	NA	dt_2 (min) =	9.00
T (m^2/s) =	NA	T (m^2/s) =	1.9E-09
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	3.8E-10
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 (-) =	2.06
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0.24	C (m^3/Pa) =	2.1E-11
dt_2 (min) =	9.00	C_D (-) =	2.3E-03
T_T (m^2/s) =	1.9E-09	ξ (-) =	2.06
S (-) =	1.0E-06		
K_s (m/s) =	3.8E-10		
S_s (1/m) =	2.0E-07		

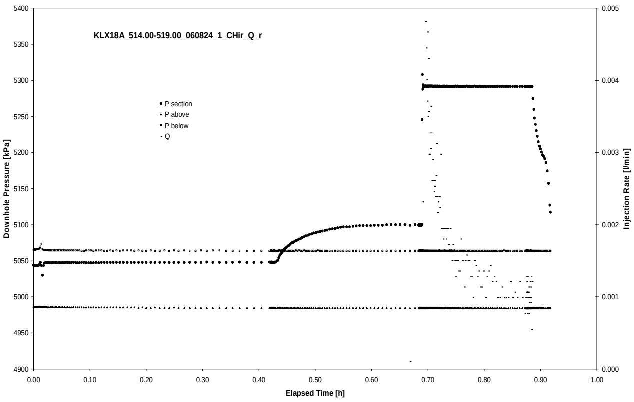
Comments:

The recommended transmissivity of 1.9E-09 m2/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 1.0E-10 to 3.0E-09 m2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060824 18:02
Test section from - to (m):	514.00-519.00 m	Responsible for test execution:	Reinder van der Wall 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) =	5043		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	0	t_F (s) =	0
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.7		
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-10	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-10	ξ (-) =	NA
S (-) =	NA		
K_s (m/s) =	NA		
S_s (1/m) =	NA		

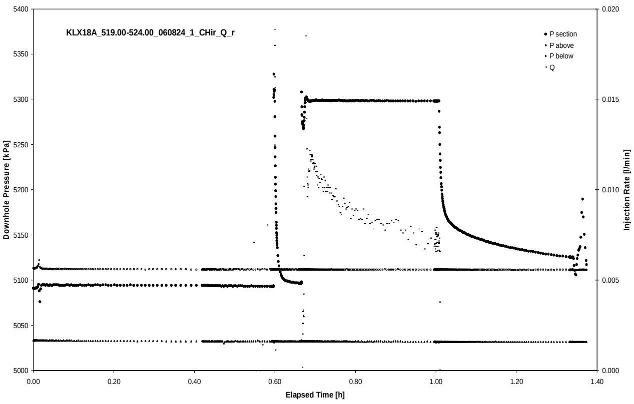
Comments:

Based on the test response the interval transmissivity is assumed to be 1E-10 m2/s.

Test Summary Sheet

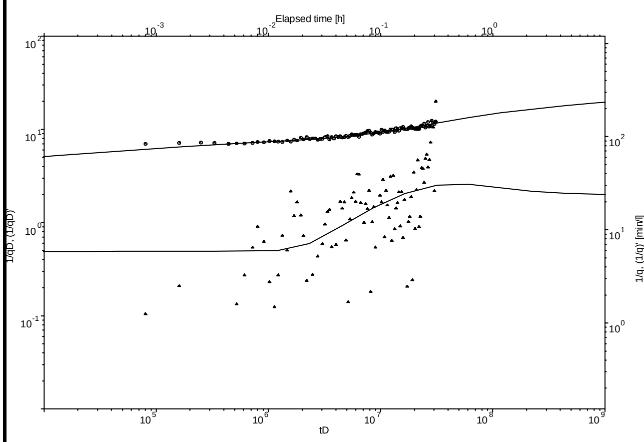
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060824 19:21
Test section from - to (m):	519.00-524.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

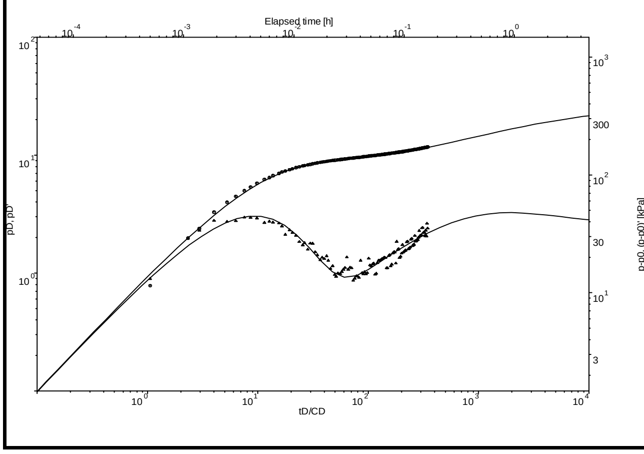


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5092		
p_i (kPa) =	5098		
p_p(kPa) =	5298	p_F (kPa) =	5125
Q_p (m^3/s)=	1.17E-07		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.8		
Derivative fact.=	0.08	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	5.7E-09		
T_M (m^2/s)=	4.7E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.42	dt_1 (min) =	0.90
dt_2 (min) =	1.80	dt_2 (min) =	3.00
T (m^2/s) =	1.1E-08	T (m^2/s) =	1.5E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.2E-09	K_s (m/s) =	3.0E-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 (-) =	4.10	ξ (-) =	5.50
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) =	0.90	C (m^3/Pa) =	1.7E-11
dt_2 (min) =	3.00	C_D (-) =	1.8E-03
T_T (m^2/s) =	1.5E-08	ξ (-) =	5.50
S (-) =	1.0E-06		
K_s (m/s) =	3.0E-09		
S_s (1/m) =	2.0E-07		

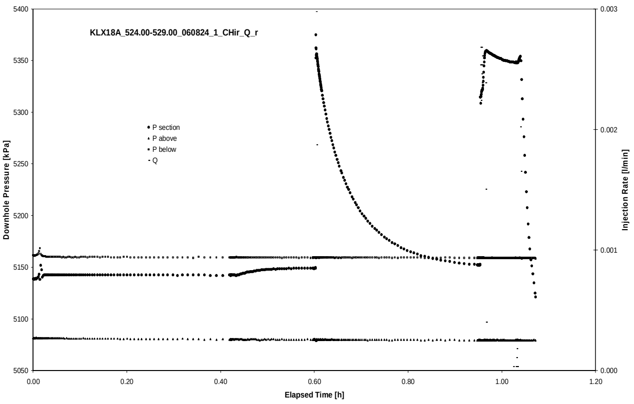
Comments:

The recommended transmissivity of 1.5E-8 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 8E-9 m2/s to 4E-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 5,102.5 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060824 21:09
Test section from - to (m):	524.00-529.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

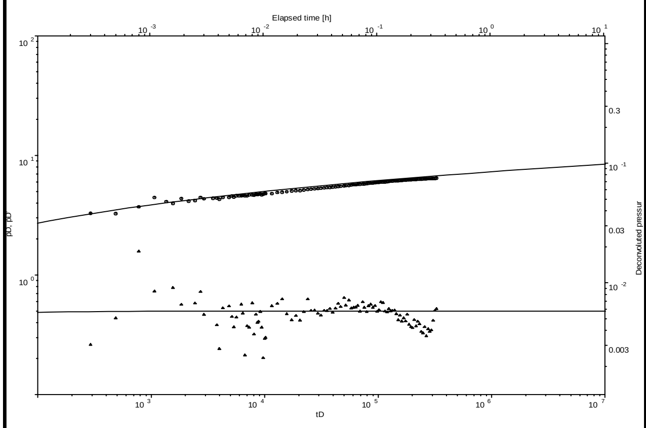
Linear plot Q and p



Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5138		
p_i (kPa) =	5149		
p_p(kPa) =	5356	p_F (kPa) =	5152
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	1262
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.8		
Derivative fact.=	NA	Derivative fact.=	0.06
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	0.15
dt_2 (min) =	NA	dt_2 (min) =	9.00
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) =	1.2E-10
S_s (1/m) =	NA	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.6E-11
C_D (-) =	NA	C_D (-) =	1.8E-03
ξ (-) =	NA	ξ (-) =	3.23
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) =	0.15	C (m^3/Pa) =	1.6E-11
dt_2 (min) =	9.00	C_D (-) =	1.8E-03
T_T (m^2/s) =	6.1E-10	ξ (-) =	3.23
S (-) =	1.0E-06		
K_s (m/s) =	1.2E-10		
S_s (1/m) =	2.0E-07		

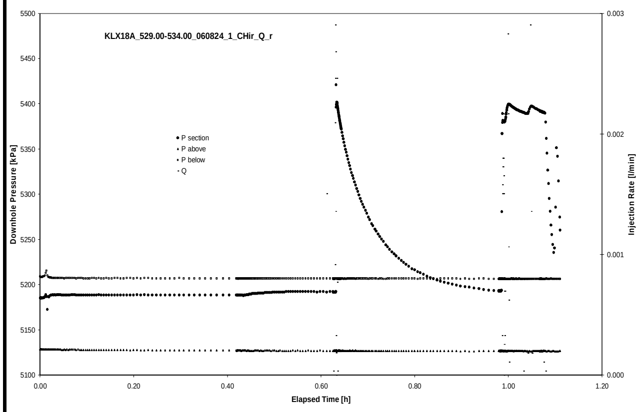
Comments:

The recommended transmissivity of 6.1E-10 m2/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 1E-10 to 8E-10 m2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060824 22:37
Test section from - to (m):	529.00-534.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

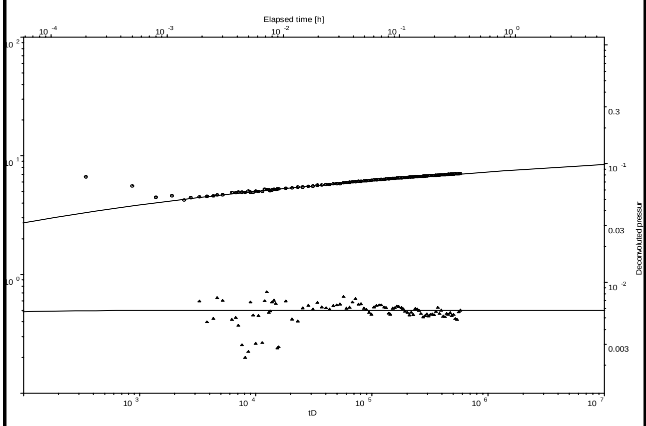


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5185		
p_i (kPa) =	5192		
p_p(kPa) =	5401	p_F (kPa) =	5194
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	1273
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	14.9		
Derivative fact.=	NA	Derivative fact.=	0.11
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	0.12
dt_2 (min) =	NA	dt_2 (min) =	18.00
T (m^2/s) =	NA	T (m^2/s) =	7.2E-10
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	1.4E-10
S_s (1/m) =	NA	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.9E-11
C_D (-) =	NA	C_D (-) =	2.1E-03
ξ (-) =	NA	ξ (-) =	3.43
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0.12	C (m^3/Pa) =	1.9E-11
dt_2 (min) =	18.00	C_D (-) =	2.1E-03
T_T (m^2/s) =	7.2E-10	ξ (-) =	3.43
S (-) =	1.0E-06		
K_s (m/s) =	1.4E-10		
S_s (1/m) =	2.0E-07		

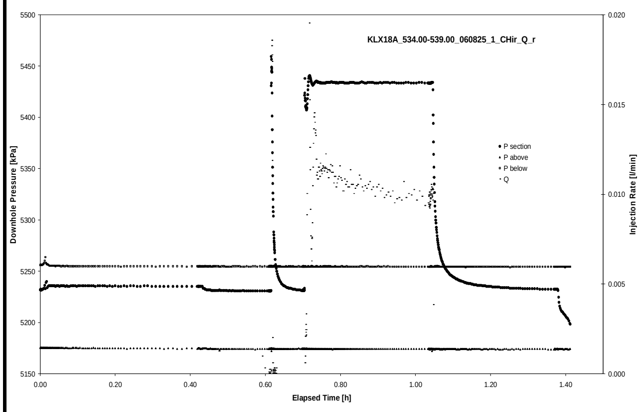
Comments:

The recommended transmissivity of 7.2•10-10 m2/s was derived from the analysis of the Pi phase. The confidence range for the interval transmissivity is estimated to be 1.0•10-10 to 9.0•10-10 m2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

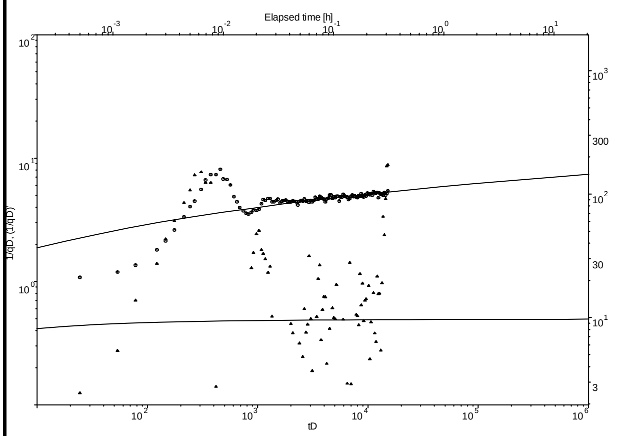
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060825 00:07
Test section from - to (m):	534.00-539.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

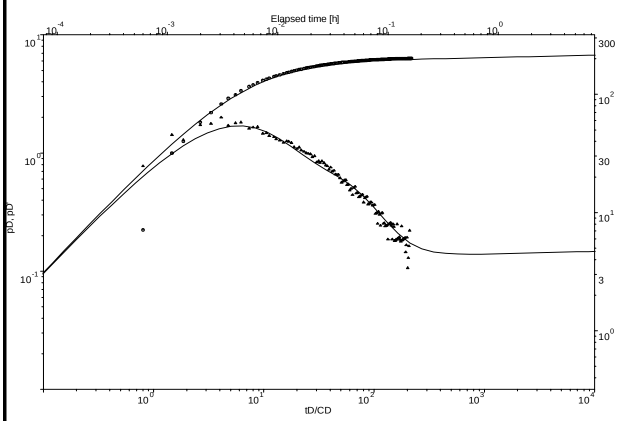
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5232		
p_i (kPa) =	5233		
p_p(kPa) =	5434	p_F (kPa) =	5232
Q_p (m^3/s)=	1.62E-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		
Derivative fact.=	0.09	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	7.9E-09		
T_M (m^2/s)=	6.5E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.50	dt_1 (min) =	0.60
dt_2 (min) =	18.00	dt_2 (min) =	2.40
T (m^2/s) =	6.6E-09	T (m^2/s) =	8.8E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.3E-09	K_s (m/s) =	1.8E-09
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.5E-11
C_D (-) =	NA	C_D (-) =	1.7E-03
ξ (-) =	0.54	ξ (-) =	2.06
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) =	0.60	C (m^3/Pa) =	1.5E-11
dt_2 (min) =	2.40	C_D (-) =	1.7E-03
T_T (m^2/s) =	8.8E-09	ξ (-) =	2.06
S (-) =	1.0E-06		
K_s (m/s) =	1.8E-09		
S_s (1/m) =	2.0E-07		

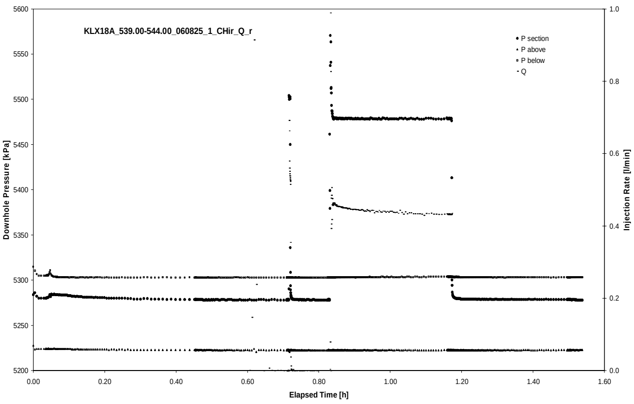
Comments:

The recommended transmissivity of 8.8E-9 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 4E-9 m2/s to 3E-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 5,227.9 kPa.

Test Summary Sheet

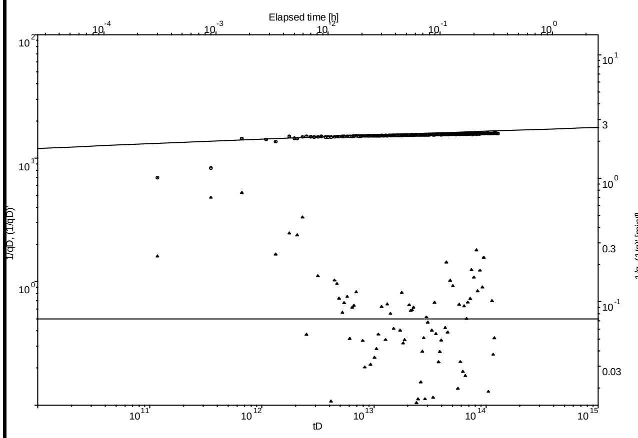
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060825 06:09
Test section from - to (m):	539.00-544.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, 2·r_w (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

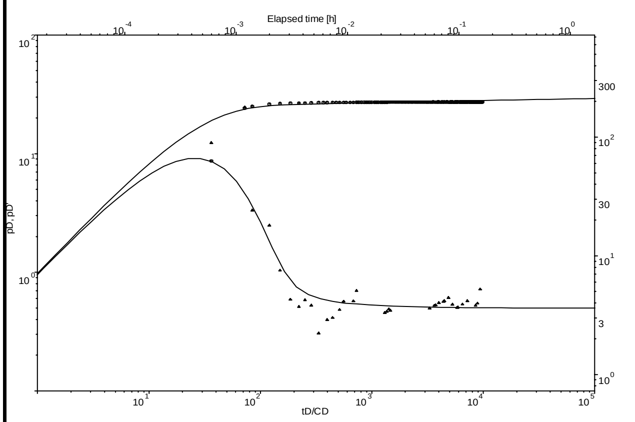


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5286		
p_i (kPa) =	5278		
p_p(kPa) =	5478	p_F (kPa) =	5278
Q_p (m^3/s)=	7.20E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.1		
Derivative fact.=	0.02	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	3.5E-07		
T_M (m^2/s)=	2.9E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.72	dt_1 (min) =	0.18
dt_2 (min) =	15.00	dt_2 (min) =	9.00
T (m^2/s) =	9.0E-07	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) =	3.2E-07
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	6.0E-11
C_D (-) =	NA	C_D (-) =	6.6E-03
ξ (-) =	9.49	ξ (-) =	20.90
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) =	0.18	C (m^3/Pa) =	6.0E-11
dt_2 (min) =	9.00	C_D (-) =	6.6E-03
T_T (m^2/s) =	1.6E-06	ξ (-) =	20.90
S (-) =	1.0E-06		
K_s (m/s) =	3.2E-07		
S_s (1/m) =	2.0E-07		

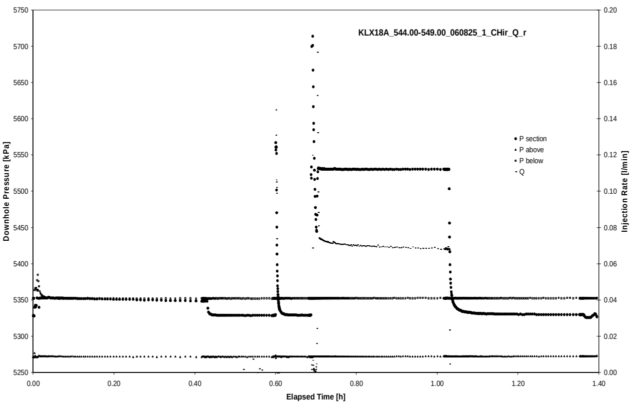
Comments:

The recommended transmissivity of 1.6E-6 m2/s was derived from the analysis of the CHir phase, because of its horizontal derivative stabilization at late times. The confidence range for the interval transmissivity is estimated to be 7E-7 m2/s to 3E-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 5,278.3 kPa.

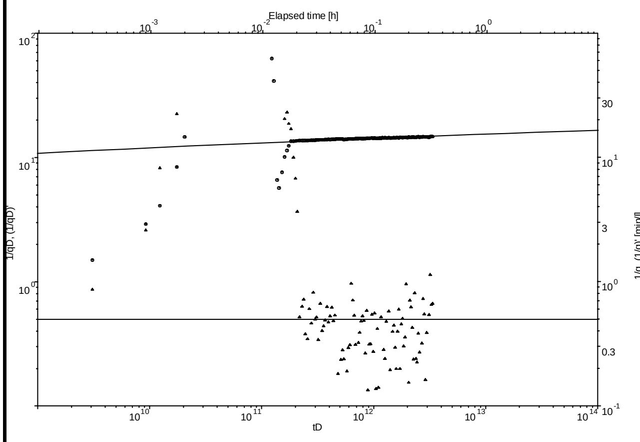
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060825 08:29
Test section from - to (m):	544.00-549.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

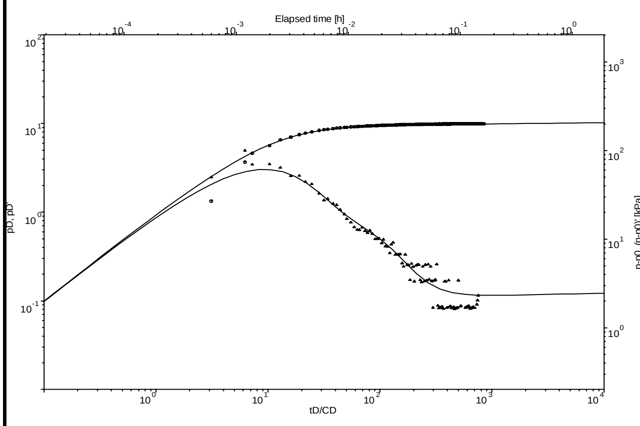
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5328		
p_i (kPa) =	5329		
p_p(kPa) =	5530	p_F (kPa) =	5330
Q_p (m^3/s)=	1.13E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.1		
Derivative fact.=	0.06	Derivative fact.=	0.06
Results		**Results**	
Q/s (m^2/s)=	5.5E-08		
T_M (m^2/s)=	4.6E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.20	dt_1 (min) =	0.30
dt_2 (min) =	18.00	dt_2 (min) =	1.20
T (m^2/s) =	1.3E-07	T (m^2/s) =	9.1E-08
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	2.6E-08	K_s (m/s) =	1.8E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	4.0E-11
C_D (-) =	NA	C_D (-) =	4.4E-03
ξ (-) =	8.64	ξ (-) =	5.02
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) =	0.30	C (m^3/Pa) =	4.0E-11
dt_2 (min) =	1.20	C_D (-) =	4.4E-03
T_T (m^2/s) =	9.1E-08	ξ (-) =	5.02
S (-) =	1.0E-06		
K_s (m/s) =	1.8E-08		
S_s (1/m) =	2.0E-07		

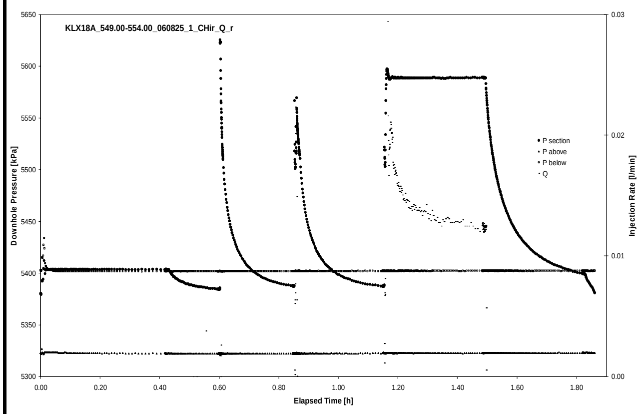
Comments:

The recommended transmissivity of 9.1E-8 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 6E-8 m2/s to 4E-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 5,329.3 kPa.

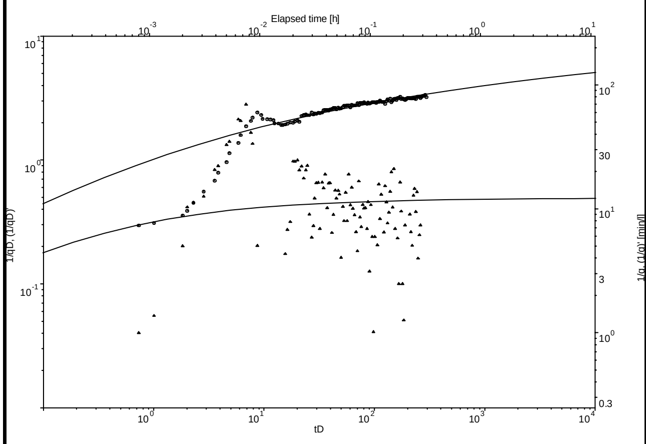
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060825 10:32
Test section from - to (m):	549.00-554.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

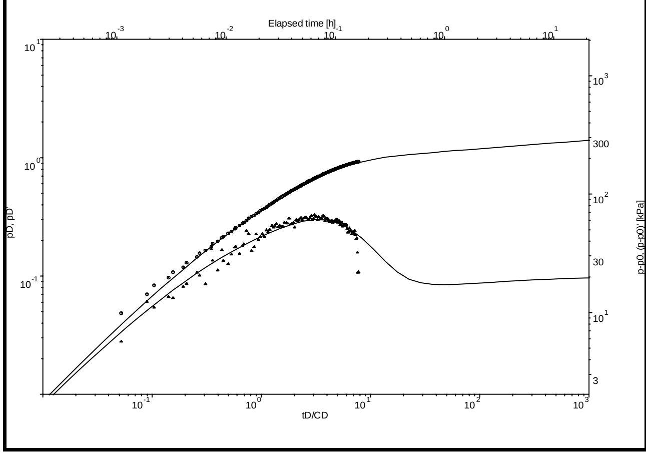
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		**Recovery period**	
Indata		**Indata**	
p_0 (kPa) =	5380		
p_i (kPa) =	5388		
p_p(kPa) =	5589	p_F (kPa) =	5398
Q_p (m^3/s)=	2.00E-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)=	15.2		
Derivative fact.=	0.07	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	9.8E-09		
T_M (m^2/s)=	8.1E-09		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.56	dt_1 (min) =	6.00
dt_2 (min) =	18.00	dt_2 (min) =	9.00
T (m^2/s) =	5.2E-09	T (m^2/s) =	9.8E-09
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.0E-09	K_s (m/s) =	2.0E-09
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	9.4E-11
C_D (-) =	NA	C_D (-) =	1.0E-02
ξ (-) =	-1.33	ξ (-) =	-2.92
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) =	6.00	C (m^3/Pa) =	9.4E-11
dt_2 (min) =	9.00	C_D (-) =	1.0E-02
T_T (m^2/s) =	9.8E-09	ξ (-) =	-2.92
S (-) =	1.0E-06		
K_s (m/s) =	2.0E-09		
S_s (1/m) =	2.0E-07		

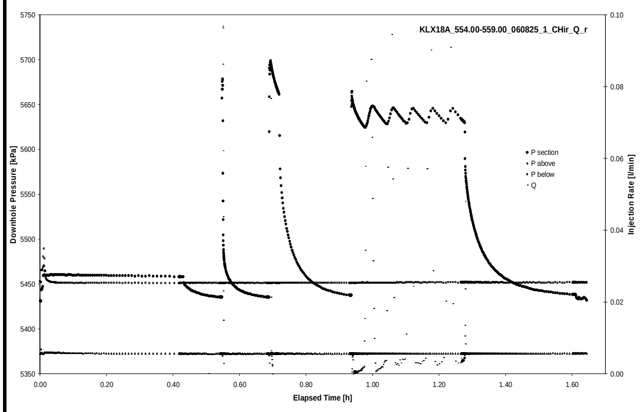
Comments:

The recommended transmissivity of 9.8E-09 m2/s was derived from the analysis of the CHir phase (outer phase). The confidence range for the interval transmissivity is estimated to be 1E-09 m2/s to 2E-08 m2/s (this range includes the inner zone transmissivity of the CHir phase). 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 5,365.8 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060825 13:24
Test section from - to (m):	554.00-559.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

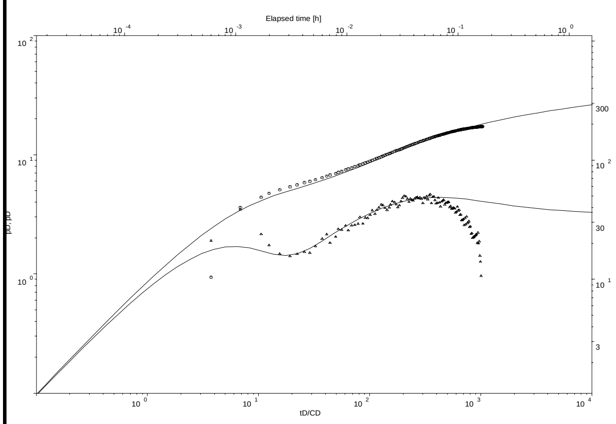


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5447		
p_i (kPa) =	5437		
p_p(kPa) =	5633	p_F (kPa) =	5438
Q_p (m^3/s)=	7.50E-08		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.3		
Derivative fact.=	NA	Derivative fact.=	0.02
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) =	NA	dt_1 (min) =	0.90
dt_2 (min) =	NA	dt_2 (min) =	3.60
T (m^2/s) =	NA	T (m^2/s) =	1.9E-09
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	3.8E-10
S_s (1/m) =	NA	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	4.3E-12
C_D (-) =	NA	C_D (-) =	4.8E-04
ξ (-) =	NA	ξ (-) =	2.68
T_{GRF}(m^2/s) =	NA	T_{GRF}(m^2/s) =	NA
S_{GRF}(-) =	NA	S_{GRF}(-) =	NA
D_{GRF} (-) =	NA	D_{GRF} (-) =	NA

Log-Log plot incl. derivates- flow period

Not Analysed

Log-Log plot incl. derivatives- recovery period



Selected representative parameters.

dt_1 (min) =	0.90	C (m^3/Pa) =	4.3E-12
dt_2 (min) =	3.60	C_D (-) =	4.8E-04
T_T (m^2/s) =	1.9E-09	ξ (-) =	2.68
S (-) =	1.0E-06		
K_s (m/s) =	3.8E-10		
S_s (1/m) =	2.0E-07		

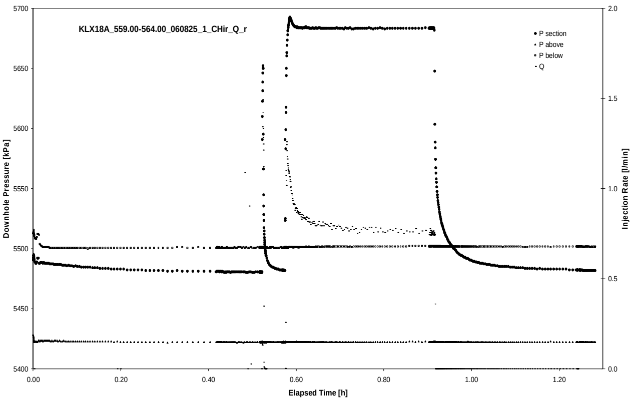
Comments:

The recommended transmissivity of 1.9E-09 m2/s was derived from the analysis of the CHir phase (outer phase). The confidence range for the interval transmissivity is estimated to be 8E-10 m2/s to 5E-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 5,421.4 kPa.

Test Summary Sheet

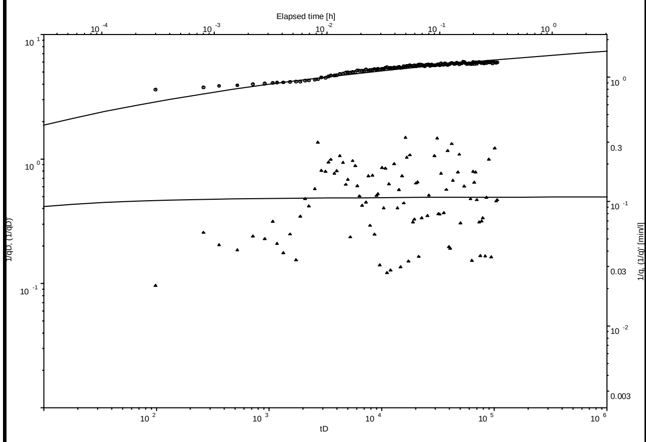
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060825 15:36
Test section from - to (m):	559.00-564.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

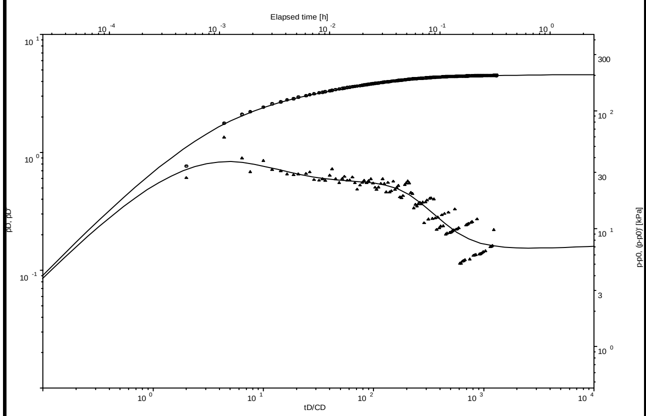


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5490		
p_i (kPa) =	5481		
p_p(kPa) =	5683	p_F (kPa) =	5482
Q_p (m^3/s)=	1.27E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.3		
Derivative fact.=	0.03	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	6.2E-07		
T_M (m^2/s)=	5.1E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.36	dt_1 (min) =	0.24
dt_2 (min) =	18.00	dt_2 (min) =	2.40
T (m^2/s) =	5.9E-07	T (m^2/s) =	4.6E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	1.2E-07	K_s (m/s) =	9.3E-08
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	2.7E-10
C_D (-) =	NA	C_D (-) =	2.9E-02
ξ (-) =	-0.75	ξ (-) =	-1.68
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) =	0.24	C (m^3/Pa) =	2.7E-10
dt_2 (min) =	2.40	C_D (-) =	2.9E-02
T_T (m^2/s) =	4.6E-07	ξ (-) =	-1.68
S (-) =	1.0E-06		
K_s (m/s) =	9.3E-08		
S_s (1/m) =	2.0E-07		

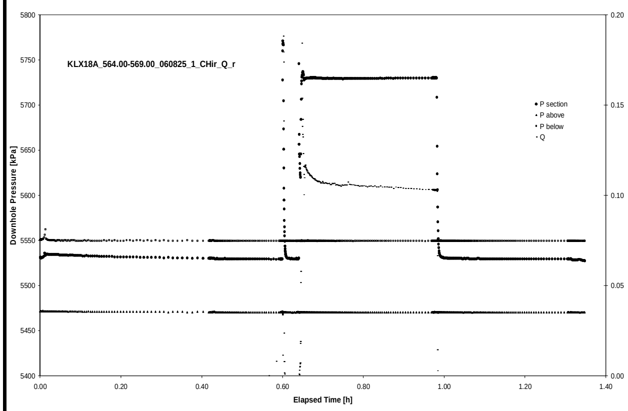
Comments:

The recommended transmissivity of 4.6E-07 m2/s was derived from the analysis of the CHir phase (inner phase), which shows the clearest derivative stabilization. The confidence range for the interval transmissivity is estimated to be 1E-07 m2/s to 7E-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 5,474.5 kPa.

Test Summary Sheet

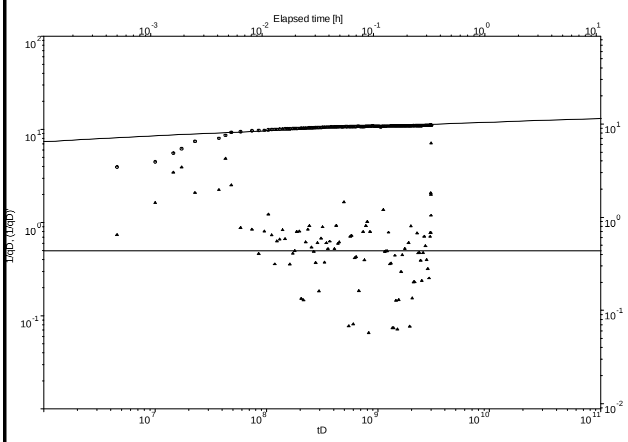
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060825 17:19
Test section from - to (m):	564.00-569.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

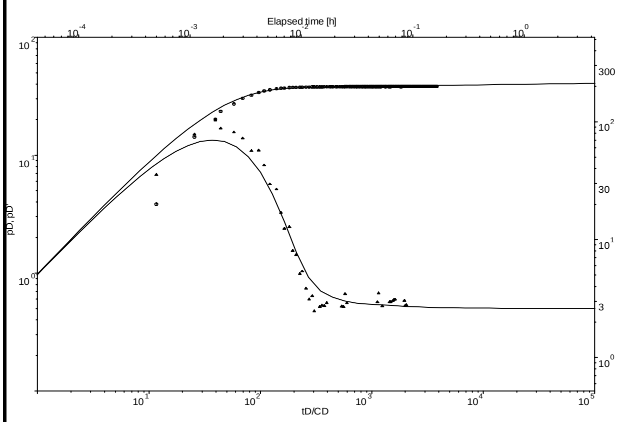


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5531		
p_i (kPa) =	5530		
p_p(kPa) =	5730	p_F (kPa) =	5528
Q_p (m³/s)=	1.72E-06		
tp (s) =	1200	t_F (s) =	1200
S el S* (-)=	1.00E-06	S el S* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.4		
Derivative fact.=	0.01	Derivative fact.=	0.03
Results		**Results**	
Q/s (m²/s)=	8.4E-08		
T_M (m²/s)=	7.0E-08		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.48	dt_1 (min) =	0.66
dt_2 (min) =	18.00	dt_2 (min) =	4.80
T (m²/s) =	1.5E-07	T (m²/s) =	5.4E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	3.0E-08	K_s (m/s) =	1.1E-07
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m³/Pa) =	NA	C (m³/Pa) =	5.3E-11
C_D (-) =	NA	C_D (-) =	5.8E-03
ξ (-) =	5.05	ξ (-) =	32.50
T_{GRF}(m²/s) =	NA	T_{GRF}(m²/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) =	0.48	C (m³/Pa) =	5.3E-11
dt_2 (min) =	18.00	C_D (-) =	5.8E-03
T_T (m²/s) =	1.5E-07	ξ (-) =	5.05
S (-) =	1.0E-06		
K_s (m/s) =	3.0E-08		
S_s (1/m) =	2.0E-07		

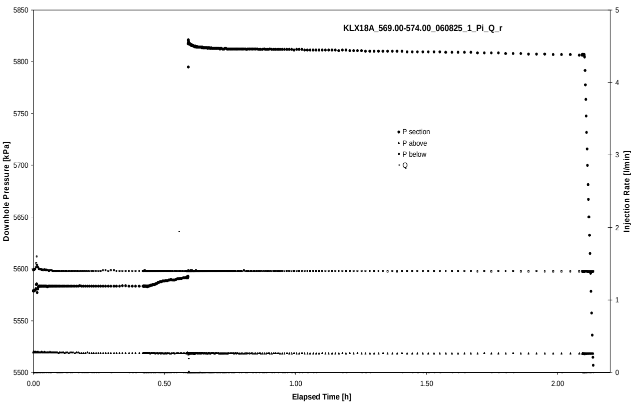
Comments:

The recommended transmissivity of 1.5E-7 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 7E-8 m2/s to 5E-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 5,529.0 kPa.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060825 19:03
Test section from - to (m):	569.00-574.00 m	Responsible for test execution:	Reinder van der Wall 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) =	5581		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
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)=	15.5		
Derivative fact.=		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) =	1.0E-11
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		

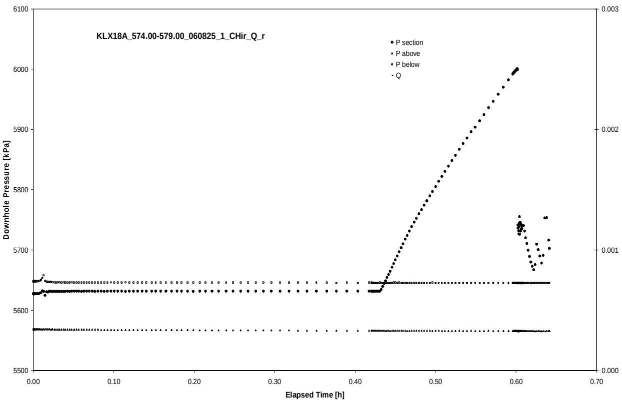
Comments:

Based on the test response the interval transmissivity is lower than 1E-11 m2/s.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060825 21:36
Test section from - to (m):	574.00-579.00 m	Responsible for test execution:	Reinder van der Wall 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) =	5627		
p_i (kPa) =	NA		
p_p(kPa) =	NA	p_F (kPa) =	NA
Q_p (m^3/s)=	NA		
tp (s) =	0	t_F (s) =	0
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.=	NA
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	NA
dt_2 (min) =	NA	dt_2 (min) =	NA
T (m^2/s) =	NA	T (m^2/s) =	1.0E-11
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		

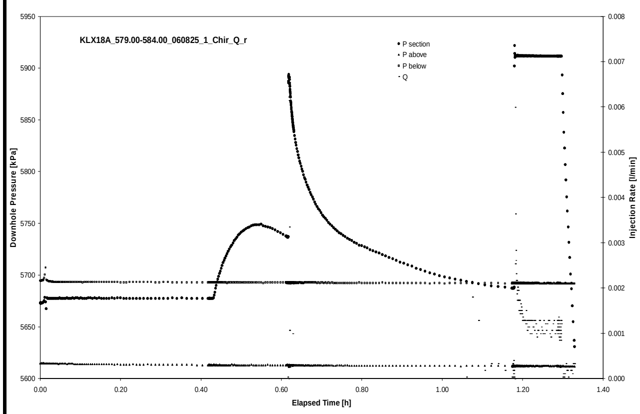
Comments:

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

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	Pi
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060825 22:38
Test section from - to (m):	579.00-584.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

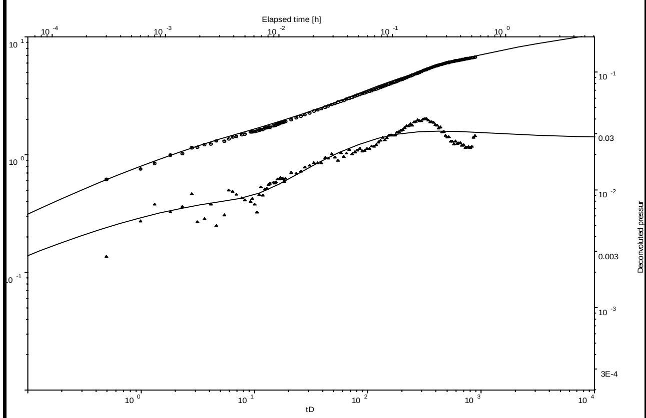


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5673		
p_i (kPa) =	5737		
p_p(kPa) =	5894	p_F (kPa) =	5688
Q_p (m^3/s)=	NA		
tp (s) =	10	t_F (s) =	2025
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.6		
Derivative fact.=	NA	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	NA		
T_M (m^2/s)=	NA		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	NA	dt_1 (min) =	4.20
dt_2 (min) =	NA	dt_2 (min) =	18.00
T (m^2/s) =	NA	T (m^2/s) =	1.4E-11
S (-) =	NA	S (-) =	1.0E-06
K_s (m/s) =	NA	K_s (m/s) =	2.8E-12
S_s (1/m) =	NA	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	1.8E-12
C_D (-) =	NA	C_D (-) =	2.0E-04
ξ (-) =	NA	ξ (-) =	2.56
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) =	4.20	C (m^3/Pa) =	1.8E-12
dt_2 (min) =	18.00	C_D (-) =	2.0E-04
T_T (m^2/s) =	1.4E-11	ξ (-) =	2.56
S (-) =	1.0E-06		
K_s (m/s) =	2.8E-12		
S_s (1/m) =	2.0E-07		

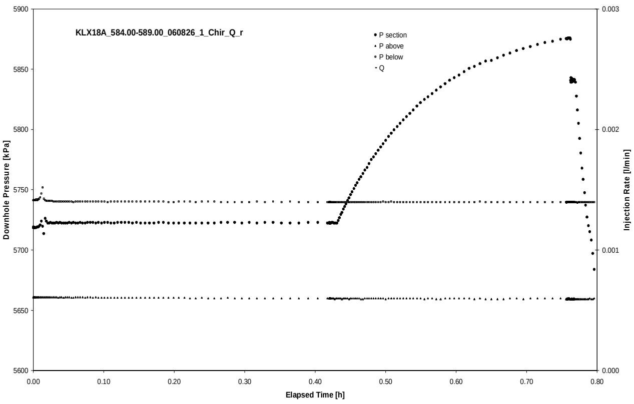
Comments:

The recommended transmissivity of 1.4E-11 m2/s was derived from the analysis of the Pi phase (outer zone). The confidence range for the interval transmissivity is estimated to be 9E-12 to 6E-11 m2/s. The flow dimension displayed during the test is 2. The static pressure could not be extrapolated due to the very low transmissivity.

Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060826 00:20
Test section from - to (m):	584.00-589.00 m	Responsible for test execution:	Reinder van der Wall 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) =	5719		
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^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.7		
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) =	1.0E-11
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		

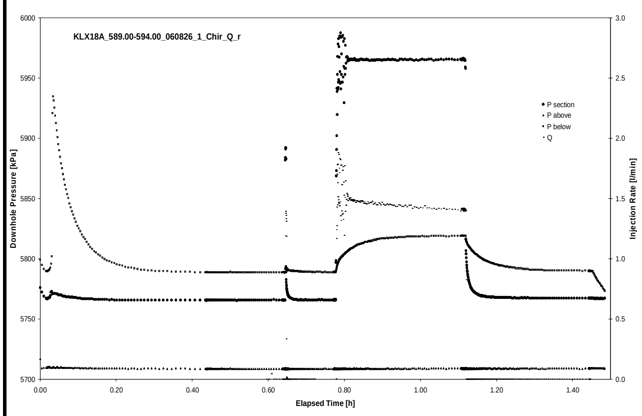
Comments:

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

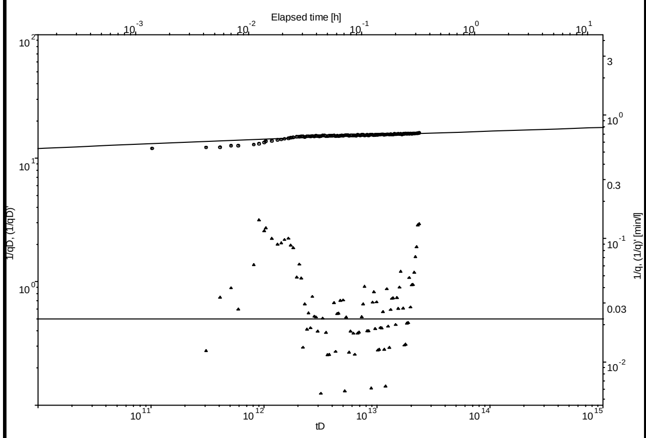
Test Summary Sheet

Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060826 06:16
Test section from - to (m):	589.00-594.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

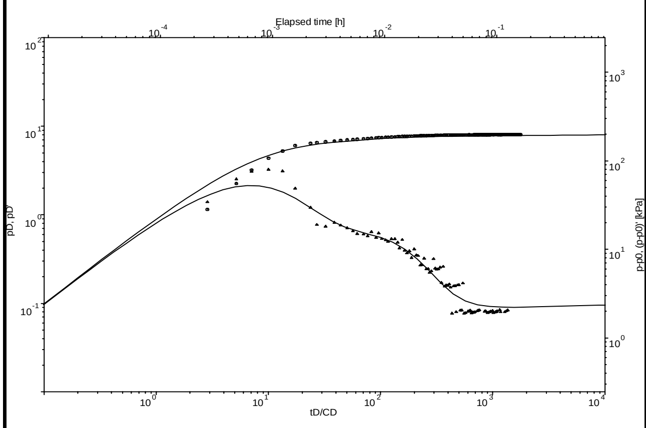
Linear plot Q and p



Log-Log plot incl. derivates- flow period



Log-Log plot incl. derivatives- recovery period



Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5776		
p_i (kPa) =	5766		
p_p(kPa) =	5966	p_F (kPa) =	5767
Q_p (m^3/s)=	2.35E-05		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.7		
Derivative fact.=	0.06	Derivative fact.=	0.05
Results		**Results**	
Q/s (m^2/s)=	1.2E-06		
T_M (m^2/s)=	9.5E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	1.62	dt_1 (min) =	0.15
dt_2 (min) =	15.00	dt_2 (min) =	0.72
T (m^2/s) =	2.9E-06	T (m^2/s) =	1.6E-06
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.8E-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) =	3.3E-10
C_D (-) =	NA	C_D (-) =	3.6E-02
ξ (-) =	8.06	ξ (-) =	1.67
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) =	0.15	C (m^3/Pa) =	3.3E-10
dt_2 (min) =	0.72	C_D (-) =	3.6E-02
T_T (m^2/s) =	1.6E-06	ξ (-) =	1.67
S (-) =	1.0E-06		
K_s (m/s) =	3.1E-07		
S_s (1/m) =	2.0E-07		

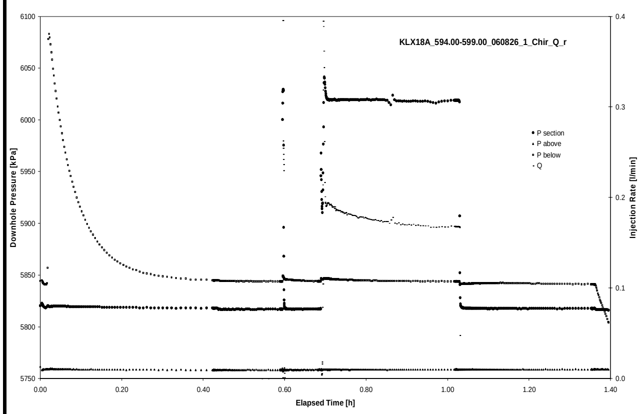
Comments:

The recommended transmissivity of 1.6E-6 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 8E-7 m2/s to 5E-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 5,766.7 kPa.

Test Summary Sheet

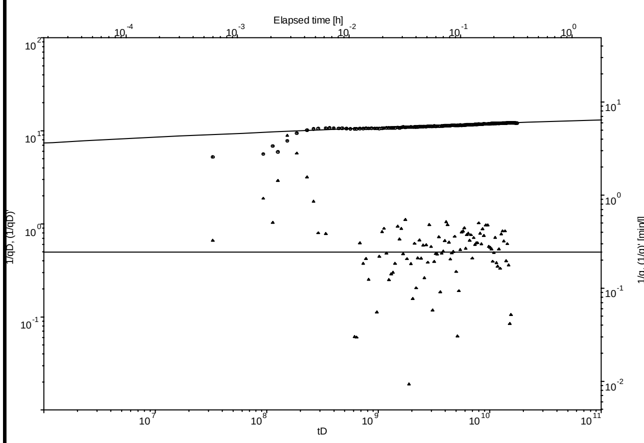
Project:	Oskarshamn site investigation	Test type:[1]	CHir
Area:	Laxemar	Test no:	1
Borehole ID:	KLX18A	Test start:	060826 08:29
Test section from - to (m):	594.00-599.00 m	Responsible for test execution:	Reinder van der Wall Philipp Wolf
Section diameter, $2 \cdot r_w$ (m):	0.076	Responsible for test evaluation:	Cristian Enachescu

Linear plot Q and p

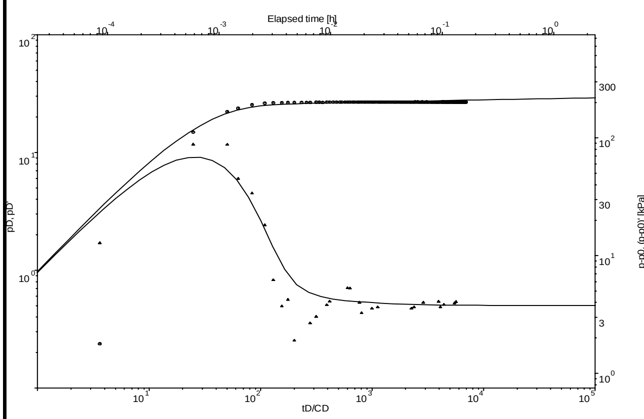


Flow period		Recovery period	
Indata		**Indata**	
p_0 (kPa) =	5822		
p_i (kPa) =	5818		
p_p(kPa) =	6019	p_F (kPa) =	5818
Q_p (m^3/s)=	2.80E-06		
tp (s) =	1200	t_F (s) =	1200
S el S^* (-)=	1.00E-06	S el S^* (-)=	1.00E-06
EC_w (mS/m)=			
$Temp_w$(gr C)=	15.9		
Derivative fact.=	0.04	Derivative fact.=	0.02
Results		**Results**	
Q/s (m^2/s)=	1.4E-07		
T_M (m^2/s)=	1.1E-07		
Flow regime:	transient	Flow regime:	transient
dt_1 (min) =	0.72	dt_1 (min) =	0.36
dt_2 (min) =	15.00	dt_2 (min) =	9.00
T (m^2/s) =	2.6E-07	T (m^2/s) =	6.1E-07
S (-) =	1.0E-06	S (-) =	1.0E-06
K_s (m/s) =	5.3E-08	K_s (m/s) =	1.2E-07
S_s (1/m) =	2.0E-07	S_s (1/m) =	2.0E-07
C (m^3/Pa) =	NA	C (m^3/Pa) =	3.3E-11
C_D (-) =	NA	C_D (-) =	3.7E-03
ξ (-) =	5.67	ξ (-) =	21.20
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) =	0.72	C (m^3/Pa) =	3.3E-11
dt_2 (min) =	15.00	C_D (-) =	3.7E-03
T_T (m^2/s) =	2.6E-07	ξ (-) =	5.67
S (-) =	1.0E-06		
K_s (m/s) =	5.3E-08		
S_s (1/m) =	2.0E-07		

Comments:

The recommended transmissivity of 2.6E-7 m2/s was derived from the analysis of the CHi phase, because of its horizontal derivative stabilization at late times. The confidence range for the interval transmissivity is estimated to be 8E-8 m2/s to 5E-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 5,817.6 kPa.

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 · 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: $nc_tb = n\cdot c_t\cdot b$	$[(L^2T^2)/M]$	m/Pa
n		Total porosity	-	-
n_e		Kinematic porosity, (Effective porosity)	-	-
e		Transport aperture. $e = n_e\cdot b$	[L]	m
ρ	Density	Density	$[M/L^3]$	$kg/(m^3)$
ρ_w	Density-w	Fluid density in measurement section during pumping/injection	$[M/L^3]$	$kg/(m^3)$
ρ_o	Density-o	Fluid density in observation section	$[M/L^3]$	$kg/(m^3)$
ρ_{sp}	Density-sp	Fluid density in standpipes from measurement section	$[M/L^3]$	$kg/(m^3)$
μ	my	Dynamic viscosity	[M/LT]	Pa s
μ_w	my	Dynamic viscosity (Fluid density in measurement section during pumping/injection)	[M/LT]	Pa s
FC_T		Fluid coefficient for intrinsic permeability, transference of k to K; $K=FC_T\cdot k$; $FC_T=\rho_w\cdot g/\mu_w$	[1/LT]	1/(ms)
FC_S		Fluid coefficient for porosity-compressibility, transference of c_t to S_s ; $S_s=FC_S\cdot n\cdot c_t$; $FC_S=\rho_w\cdot g$	$[M/T^2L^2]$	Pa/m
Index on K, T and S				
S		S: semi-log		
L		L: log-log		
f		Pump phase or injection phase, designation following S or L (withdrawal)		
s		Recovery phase, designation following S or L (recovery)		
NLR		NLR: Non-linear regression. Performed on the entire test sequence, perturbation and recovery		
M		Moye		
GRF		Generalised Radial Flow according to Barker (1988)		
m		Matrix		
f		Fracture		
T		Judged best evaluation based on transient evaluation.		

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

APPENDIX 5

SICADA data tables

(Simplified version v1.4

SICADA/Data Import Template

SKB & Ergodata AB 2004

File Identity			Compiled By	
Created By	Stephan Rohs		Quality Check For Delivery	
Created	2006-09-22		Delivery Approval	

Activity Type	KLX 18A KLX 18A - Injection test		Project	AP PS 400-06-093

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 18A	2006-08-15 10:44	2006-08-26 09:53	104.00	604.00		Golder Associates	Reinder van der Wall	Reinder van der Wall, Philipp Wolf, Thomas Cronquist, Mesgena Gebrezghi	Reinder van der Wall, Philipp Wolf, Stephan Rohs	Stephan Rohs

Table	plu_s_hole_test_d PLU Injection and pumping, General information

Column	Datatype	Unit	Column Description
site	CHAR		Investigation site name
activity_type	CHAR		Activity type code
start_date	DATE		Date (yymmdd hh:mm:ss)
stop_date	DATE		Date (yymmdd hh:mm:ss)
project	CHAR		project code
idcode	CHAR		Object or borehole identification code
secup	FLOAT	m	Upper section limit (m)
seclow	FLOAT	m	Lower section limit (m)
section_no	INTEGER	number	Section number
test_type	CHAR		Test type code (1-7), see table description
formation_type	CHAR		1: Rock, 2: Soil (superficial deposits)
start_flow_period	DATE	yyyymmdd	Date & time of pumping/injection start (YYYY-MM-DD hh:mm:ss)
stop_flow_period	DATE	yyyymmdd	Date & time of pumping/injection stop (YYYY-MM-DD hh:mm:ss)
flow_rate_end_qp	FLOAT	m**3/s	Flow rate at the end of the flowing period
value_type_qp	CHAR		0:true value,-1<lower meas.limit1:>upper meas.limit
mean_flow_rate_qm	FLOAT	m**3/s	Arithmetic mean flow rate during flow period
q_measl__l	FLOAT	m**3/s	Estimated lower measurement limit of flow rate
q_measl__u	FLOAT	m**3/s	Estimated upper measurement limit of flow rate
tot_volume_vp	FLOAT	m**3	Total volume of pumped or injected water
dur_flow_phase_tp	FLOAT	s	Duration of the flowing period of the test
dur_rec_phase_tf	FLOAT	s	Duration of the recovery period of the test
initial_head_hi	FLOAT	m	Hydraulic head in test section at start of the flow period
head_at_flow_end_h	FLOAT	m	Hydraulic head in test section at stop of the flow period.
final_head_hf	FLOAT	m	Hydraulic head in test section at stop of recovery period.
initial_press_pi	FLOAT	kPa	Groundwater pressure in test section at start of flow period
press_at_flow_end_	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 18A	060815 10:44:00	060815 12:10:00	104.00	204.00		3	1	2006-08-15 11:38:39	2006-08-15 12:08:49	1.42E-04	0	1.53E-04	1.67E-08	8.33E-04	2.76E-01
KLX 18A	060815 14:05:00	060815 16:10:00	204.00	304.00		3	1	2006-08-15 15:08:02	2006-08-15 15:38:12	1.32E-06	0	1.57E-06	1.67E-08	8.33E-04	2.83E-03
KLX 18A	060815 17:25:00	060815 19:19:00	304.00	404.00		3	1	2006-08-15 18:17:32	2006-08-15 18:47:42	5.63E-05	0	6.00E-05	1.67E-08	8.33E-04	1.08E-01
KLX 18A	060815 21:08:00	060815 23:01:00	404.00	504.00		3	1	2006-08-15 21:59:39	2006-08-15 22:29:49	6.48E-05	0	6.93E-05	1.67E-08	8.33E-04	1.25E-01
KLX 18A	060816 07:34:00	060816 09:40:00	504.00	604.00		3	1	2006-08-16 08:38:43	2006-08-16 09:08:53	4.25E-05	0	1.67E-04	1.67E-08	8.33E-04	3.00E-01
KLX 18A	060816 19:58:00	060816 21:22:00	104.00	124.00		3	1	2006-08-16 20:39:45	2006-08-16 20:59:55	1.58E-04	0	1.67E-04	1.67E-08	8.33E-04	1.67E-04
KLX 18A	060816 22:02:00	060816 23:27:00	124.00	144.00		3	1	2006-08-16 22:45:20	2006-08-16 23:05:30	4.65E-05	0	4.82E-05	1.67E-08	8.33E-04	5.78E-02
KLX 18A	060816 23:59:00	060817 01:27:00	144.00	164.00		3	1	2006-08-17 00:45:41	2006-08-17 01:05:51	6.63E-06	0	7.48E-06	1.67E-08	8.33E-04	8.98E-03
KLX 18A	060817 06:38:00	060817 08:23:00	164.00	184.00		3	1	2006-08-17 07:41:42	2006-08-17 08:01:52	1.83E-07	0	2.15E-07	1.67E-08	8.33E-04	2.58E-04
KLX 18A	060817 09:06:00	060817 10:48:00	184.00	204.00		3	1	2006-08-17 10:06:56	2006-08-17 10:27:06	8.27E-08	0	1.10E-07	1.67E-08	8.33E-04	1.32E-04
KLX 18A	060817 11:27:00	060817 13:32:00	204.00	224.00		3	1	2006-08-17 12:14:13	2006-08-17 12:39:23	7.00E-08	0	9.03E-08	1.67E-08	8.33E-04	1.35E-04
KLX 18A	060817 14:08:00	060817 16:08:00	224.00	244.00		4B	1	2006-08-17 14:59:06	2006-08-17 14:59:16	#NV	0	#NV	1.67E-08	8.33E-04	1.89E-05
KLX 18A	060817 16:43:00	060817 18:16:00	244.00	264.00		3	1	2006-08-17 17:34:38	2006-08-17 17:54:48	1.17E-06	0	1.40E-06	1.67E-08	8.33E-04	1.68E-03
KLX 18A	060817 18:46:00	060817 20:28:00	264.00	284.00		3	1	2006-08-17 19:46:27	2006-08-17 20:06:37	1.00E-07	0	1.33E-07	1.67E-08	8.33E-04	1.60E-04
KLX 18A	060817 21:22:00	060817 23:01:00	284.00	304.00		3	1	2006-08-17 22:19:20	2006-08-17 22:39:30	6.67E-08	0	8.33E-08	1.67E-08	8.33E-04	1.00E-04
KLX 18A	060817 23:30:00	060818 00:54:00	304.00	324.00		3	1	2006-08-18 00:12:14	2006-08-18 00:32:24	6.67E-07	0	7.17E-07	1.67E-08	8.33E-04	8.60E-04
KLX 18A	060818 01:24:00	060818 02:47:00	324.00	344.00		3	1	2006-08-18 02:05:23	2006-08-18 02:25:33	1.90E-05	0	1.98E-05	1.67E-08	8.33E-04	2.38E-02
KLX 18A	060818 06:29:00	060818 08:03:00	344.00	364.00		3	1	2006-08-18 07:21:23	2006-08-18 07:41:33	2.93E-05	0	1.67E-04	1.67E-08	8.33E-04	2.00E-01
KLX 18A	060818 08:34:00	060818 10:01:00	364.00	384.00		3	1	2006-08-18 09:19:07	2006-08-18 09:39:17	9.22E-06	0	9.52E-06	1.67E-08	8.33E-04	1.14E-02
KLX 18A	060818 10:38:00	060818 12:07:00	384.00	404.00		3	1	2006-08-18 11:25:06	2006-08-18 11:45:16	8.30E-06	0	8.85E-06	1.67E-08	8.33E-04	1.06E-02
KLX 18A	060818 13:16:00	060818 14:45:00	404.00	424.00		3	1	2006-08-18 14:03:11	2006-08-18 14:23:21	3.71E-05	0	3.83E-05	1.67E-08	8.33E-04	4.60E-02
KLX 18A	060818 15:16:00	060818 16:46:00	424.00	444.00		3	1	2006-08-18 16:04:31	2006-08-18 16:24:41	4.43E-05	0	4.65E-05	1.67E-08	8.33E-04	5.58E-02
KLX 18A	060818 17:20:00	060818 18:44:00	444.00	464.00		3	1	2006-08-18 18:01:57	2006-08-18 18:22:07	1.47E-06	0	1.55E-06	1.67E-08	8.33E-04	1.86E-03
KLX 18A	060818 19:19:00	060818 20:35:00	464.00	484.00		3	1	2006-08-18 19:53:34	2006-08-18 20:13:44	1.27E-06	0	1.37E-06	1.67E-08	8.33E-04	1.64E-03
KLX 18A	060819 00:45:00	060819 04:09:00	484.00	504.00		3	1	2006-08-19 01:47:42	2006-08-19 02:07:52	4.73E-07	0	9.24E-07	1.67E-08	8.33E-04	1.11E-03
KLX 18A	060819 06:24:00	060819 08:12:00	504.00	524.00		3	1	2006-08-19 07:30:57	2006-08-19 07:51:07	4.70E-07	0	6.61E-07	1.67E-08	8.33E-04	7.93E-04
KLX 18A	060819 08:45:00	060819 10:16:00	524.00	544.00		3	1	2006-08-19 09:34:14	2006-08-19 09:54:24	5.53E-06		5.68E-06	1.67E-08	8.33E-04	6.82E-03
KLX 18A	060819 10:56:00	060819 12:36:00	544.00	564.00		3	1	2006-08-19 11:54:33	2006-08-19 12:14:43	1.19E-05	0	1.27E-05	1.67E-08	8.33E-04	1.52E-02
KLX 18A	060819 13:29:00	060819 14:56:00	564.00	584.00		3	1	2006-08-19 14:14:36	2006-08-19 14:34:46	1.43E-06	0	1.49E-06	1.67E-08	8.33E-04	1.79E-03
KLX 18A	060819 15:30:00	060819 16:51:00	584.00	604.00		3	1	2006-08-19 16:09:53	2006-08-19 16:30:03	2.33E-05	0	2.39E-05	1.67E-08	8.33E-04	2.87E-02
KLX 18A	060820 08:53:00	060820 10:28:00	299.00	304.00		3	1	2006-08-19 09:46:02	2006-08-19 10:06:12	2.50E-08	0	2.53E-08	1.67E-08	8.33E-04	3.04E-05
KLX 18A	060820 10:58:00	060820 12:56:00	304.00	309.00		4B	1	2006-08-20 11:40:50	2006-08-20 11:41:00	#NV	0	#NV	1.67E-08	8.33E-04	3.31E-06
KLX 18A	060820 13:33:00	060820 15:04:00	309.00	314.00		3	1	2006-08-20 14:22:00	2006-08-20 14:42:10	3.33E-08	0	3.77E-08	1.67E-08	8.33E-04	4.52E-05
KLX 18A	060820 15:29:00	060820 16:27:00	314.00	319.00		4B	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 18A	060820 16:52:00	060820 18:12:00	319.00	324.00		3	1	2006-08-20 17:30:48	2006-08-20 17:50:58	6.00E-07	0	6.17E-07	1.67E-08	8.33E-04	7.40E-04
KLX 18A	060820 18:35:00	060820 19:31:00	324.00	329.00		4B	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 18A	060820 19:53:00	060820 21:14:00	329.00	334.00		3	1	2006-08-20 20:32:22	2006-08-20 20:52:32	5.00E-06	0	5.28E-06	1.67E-08	8.33E-04	6.34E-03
KLX 18A	060820 21:58:00	060820 23:46:00	334.00	339.00		3	1	2006-08-20 23:03:52	2006-08-20 23:24:02	9.33E-06	0	9.62E-06	1.67E-08	8.33E-04	1.15E-02
KLX 18A	060821 00:08:00	060821 01:31:00	339.00	344.00		3	1	2006-08-21 00:49:15	2006-08-21 01:09:25	4.33E-06	0	4.67E-06	1.67E-08	8.33E-04	5.60E-03
KLX 18A	060821 01:55:00	060821 03:24:00	344.00	349.00		3	1	2006-08-21 02:42:21	2006-08-21 03:02:31	2.21E-05	0	2.28E-05	1.67E-08	8.33E-04	2.74E-02
KLX 18A	060821 06:23:00	060821 08:08:00	349.00	354.00		3	1	2006-08-21 07:26:31	2006-08-21 07:46:41	4.32E-07	0	4.33E-07	1.67E-08	8.33E-04	5.20E-04
KLX 18A	060821 08:44:00	060821 10:08:00	354.00	359.00		4B	1	2006-08-21 09:17:09	2006-08-21 09:17:19	#NV	0	#NV	1.67E-08	8.33E-04	6.82E-05
KLX 18A	060821 10:37:00	060821 12:02:00	359.00	364.00		3	1	2006-08-21 11:20:32	2006-08-21 11:40:42	7.98E-06	0	8.23E-06	1.67E-08	8.33E-04	9.88E-03
KLX 18A	060821 13:02:00	060821 14:22:00	364.00	369.00		3	1	2006-08-21 13:40:08	2006-08-21 14:00:18	7.75E-06	0	7.88E-06	1.67E-08	8.33E-04	9.46E-03
KLX 18A	060821 15:02:00	060821 16:20:00	369.00	374.00		3	1	2006-08-21 15:38:27	2006-08-21 15:58:37	3.50E-06	0	3.58E-06	1.67E-08	8.33E-04	4.30E-03
KLX 18A	060821 16:42:00	060821 18:05:00	374.00	379.00		3	1	2006-08-21 17:23:02	2006-08-21 17:53:12	2.33E-06	0	2.50E-06	1.67E-08	8.33E-04	3.00E-03
KLX 18A	060821 18:28:00	060821 19:48:00	379.00	384.00		3	1	2006-08-21 19:05:52	2006-08-21 19:26:02	1.28E-06	0	1.35E-06	1.67E-08	8.33E-04	1.62E-03
KLX 18A	060821 20:20:00	060821 21:41:00	384.00	389.00		3	1	2006-08-21 20:59:23	2006-08-21 21:19:33	2.00E-06	0	2.12E-06	1.67E-08	8.33E-04	2.54E-03

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 18A	104.00	204.00	1800	1800				1978	2178	1987	9.7						154.00
KLX 18A	204.00	304.00	1800	1800				2950	3150	2954	11.3						254.00
KLX 18A	304.00	404.00	1800	1800				3915	4114	3915	12.8						354.00
KLX 18A	404.00	504.00	1800	1800				4881	5081	4883	14.5						454.00
KLX 18A	504.00	604.00	1800	1800				5864	6065	5867	16.0						554.00
KLX 18A	104.00	124.00	1200	1200				1204	1404	1206	8.6						114.00
KLX 18A	124.00	144.00	1200	1200				1400	1601	1404	8.8						134.00
KLX 18A	144.00	164.00	1200	1200				1592	1792	1592	9.1						154.00
KLX 18A	164.00	184.00	1200	1200				1788	1994	1807	9.4						174.00
KLX 18A	184.00	204.00	1200	1200				1984	2186	1993	9.7						194.00
KLX 18A	204.00	224.00	1500	3060				2172	2387	2179	10.0						214.00
KLX 18A	224.00	244.00	10	3721				2366	2605	2401	10.4						234.00
KLX 18A	244.00	264.00	1200	1200				2559	2758	2565	10.7						254.00
KLX 18A	264.00	284.00	1200	1200				2766	2983	2813	11.0						274.00
KLX 18A	284.00	304.00	1200	1200				2974	3197	2982	11.3						294.00
KLX 18A	304.00	324.00	1200	1200				3137	3337	3136	11.6						314.00
KLX 18A	324.00	344.00	1200	1200				3331	3531	3331	11.9						334.00
KLX 18A	344.00	364.00	1200	1200				3524	3724	3525	12.2						354.00
KLX 18A	364.00	384.00	1200	1200				3720	3921	3721	12.5						374.00
KLX 18A	384.00	404.00	1200	1200				3913	4114	3914	12.8						394.00
KLX 18A	404.00	424.00	1200	1200				4107	4307	4108	13.1						414.00
KLX 18A	424.00	444.00	1200	1200				4301	4501	4302	13.5						434.00
KLX 18A	444.00	464.00	1200	1200				4507	4706	4507	13.8						454.00
KLX 18A	464.00	484.00	1200	1200				4700	4899	4701	14.1						474.00
KLX 18A	484.00	504.00	1200	7200				4915	5116	4927	14.5						494.00
KLX 18A	504.00	524.00	1200	1200				5092	5292	5127	14.8						514.00
KLX 18A	524.00	544.00	1200	1200				5279	5480	5280	15.0						534.00
KLX 18A	544.00	564.00	1200	1200				5479	5679	5480	15.4						554.00
KLX 18A	564.00	584.00	1200	1200				5674	5874	5674	15.7						574.00
KLX 18A	584.00	604.00	1200	1200				5869	6069	5870	16.0						594.00
KLX 18A	299.00	304.00	1200	1200				2945	3170	2946	11.2						301.50
KLX 18A	304.00	309.00	10	4140				3006	3234	3195	11.3						306.50
KLX 18A	309.00	314.00	1200	1200				3042	3273	3043	11.4						311.50
KLX 18A	314.00	319.00	#NV	#NV				#NV	#NV	#NV	11.5						316.50
KLX 18A	319.00	324.00	1200	1200				3140	3339	3139	11.6						321.50
KLX 18A	324.00	329.00	#NV	#NV				#NV	#NV	#NV	11.7						326.50
KLX 18A	329.00	334.00	1200	1200				3236	3437	3236	11.8						331.50
KLX 18A	334.00	339.00	1200	1200				3284	3484	3282	11.9						336.50
KLX 18A	339.00	344.00	1200	1200				3332	3533	3332	11.9						341.50
KLX 18A	344.00	349.00	1200	1200				3381	3581	3381	12.0						346.50
KLX 18A	349.00	354.00	1200	1200				3428	3601	3428	12.1						351.50
KLX 18A	354.00	359.00	10	2714				3489	3707	3538	12.2						356.50
KLX 18A	359.00	364.00	1200	1200				3527	3728	3527	12.2						361.50
KLX 18A	364.00	369.00	1200	1200				3574	3775	3575	12.3						366.50
KLX 18A	369.00	374.00	1200	1200				3630	3831	3630	12.4						371.50
KLX 18A	374.00	379.00	1200	1200				3675	3875	3675	12.5						376.50
KLX 18A	379.00	384.00	1200	1200				3723	3922	3723	12.6						381.50
KLX 18A	384.00	389.00	1200	1200				3772	3971	3768	12.6						386.50

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 18A	060821 22:03:00	060821 23:33:00	389.00	394.00		3	1	2006-08-21 22:51:21	2006-08-21 23:11:31	5.67E-08	0	7.50E-08	1.67E-08	8.33E-04	9.00E-05
KLX 18A	060821 23:59:00	060822 01:29:00	394.00	399.00		3	1	2006-08-22 00:47:00	2006-08-22 01:07:10	2.50E-07	0	2.71E-07	1.67E-08	8.33E-04	3.25E-04
KLX 18A	060822 06:19:00	060822 07:37:00	399.00	404.00		3	1	2006-08-22 06:55:34	2006-08-22 07:15:44	6.28E-06	0	6.66E-06	1.67E-08	8.33E-04	7.99E-03
KLX 18A	060822 08:10:00	060822 09:32:00	404.00	409.00		3	1	2006-08-22 08:50:48	2006-08-22 09:10:58	4.55E-07	0	5.15E-07	1.67E-08	8.33E-04	6.18E-04
KLX 18A	060822 10:09:00	060822 11:36:00	409.00	414.00		3	1	2006-08-22 10:54:08	2006-08-22 11:14:18	6.50E-07	0	7.12E-07	1.67E-08	8.33E-04	8.54E-04
KLX 18A	060822 14:07:00	060822 15:25:00	414.00	419.00		3	1	2006-08-22 14:43:44	2006-08-22 15:03:54	4.12E-06	0	4.21E-06	1.67E-08	8.33E-04	5.05E-03
KLX 18A	060822 15:59:00	060822 17:19:00	419.00	424.00		3	1	2006-08-22 16:37:08	2006-08-22 16:57:18	3.32E-05	0	3.38E-05	1.67E-08	8.33E-04	4.0600E-02
KLX 18A	060822 17:42:00	060822 19:08:00	424.00	429.00		3	1	2006-08-22 18:26:29	2006-08-22 18:46:39	2.37E-05	0	2.50E-05	1.67E-08	8.33E-04	3.0000E-02
KLX 18A	060822 19:32:00	060822 20:54:00	429.00	434.00		3	1	2006-08-22 20:12:06	2006-08-22 20:32:16	2.35E-05	0	2.40E-05	1.67E-08	8.33E-04	2.8760E-02
KLX 18A	060822 21:24:00	060822 22:46:00	434.00	439.00		3	1	2006-08-22 22:04:28	2006-08-22 22:24:38	6.50E-07	0	6.83E-07	1.67E-08	8.33E-04	8.2000E-04
KLX 18A	060822 23:10:00	060823 00:35:00	439.00	444.00		4B	1	2006-08-22 23:48:32	2006-08-22 23:48:42	#NV	0	#NV	1.67E-08	8.33E-04	8.2000E-07
KLX 18A	060823 01:02:00	060823 03:40:00	444.00	449.00		4B	1	2006-08-22 01:38:30	2006-08-22 01:38:40	#NV	0	#NV	1.67E-08	8.33E-04	2.71E-05
KLX 18A	060823 06:23:00	060823 08:04:00	449.00	454.00		3	1	2006-08-23 07:22:28	2006-08-23 07:42:38	2.63E-08	0	3.36E-08	1.67E-08	8.33E-04	4.03E-05
KLX 18A	060823 08:37:00	060823 10:04:00	454.00	459.00		3	1	2006-08-23 09:22:29	2006-08-23 09:42:39	1.51E-06	0	1.61E-06	1.67E-08	8.33E-04	1.93E-03
KLX 18A	060823 10:41:00	060823 12:04:00	459.00	464.00		3	1	2006-08-23 11:32:26	2006-08-23 11:52:36	1.67E-08	0	2.10E-08	1.67E-08	8.33E-04	2.52E-05
KLX 18A	060823 13:31:00	060823 15:05:00	464.00	469.00		3	1	2006-08-23 14:23:41	2006-08-23 14:43:51	2.67E-06	0	3.10E-08	1.67E-08	8.33E-04	3.72E-05
KLX 18A	060823 16:36:00	060823 17:54:00	469.00	474.00		3	1	2006-08-23 17:12:33	2006-08-23 17:32:43	3.00E-07	0	3.08E-07	1.67E-08	8.33E-04	3.70E-04
KLX 18A	060823 18:19:00	060823 19:37:00	474.00	479.00		3	1	2006-08-23 18:55:24	2006-08-23 19:15:34	1.33E-06	0	1.45E-06	1.67E-08	8.33E-04	1.74E-03
KLX 18A	060823 20:08:00	060823 21:32:00	477.00	482.00		3	1	2006-08-23 20:50:31	2006-08-23 21:10:41	1.83E-07	0	2.00E-07	1.67E-08	8.33E-04	2.40E-04
KLX 18A	060823 21:55:00	060823 23:32:00	482.00	487.00		3	1	2006-08-23 22:50:44	2006-08-23 23:10:54	9.33E-07	0	1.12E-06	1.67E-08	8.33E-04	1.34E-03
KLX 18A	060823 23:55:00	060824 01:21:00	487.00	492.00		3	1	2006-08-23 00:39:47	2006-08-23 00:59:57	5.47E-07	0	6.22E-07	1.67E-08	8.33E-04	7.46E-04
KLX 18A	060824 06:23:00	060824 07:59:00	489.00	494.00		3	1	2006-08-24 07:17:42	2006-08-24 07:37:52	7.32E-07	0	7.87E-07	1.67E-08	8.33E-04	9.44E-04
KLX 18A	060824 08:48:00	060824 10:28:00	494.00	499.00		3	1	2006-08-24 09:46:19	2006-08-24 10:06:29	7.17E-08	0	8.93E-08	1.67E-08	8.33E-04	1.07E-04
KLX 18A	060824 11:04:00	060824 12:08:00	499.00	504.00		4B	1	2024-08-06 11:49:17	2024-08-06 11:49:27	#NV	0	#NV	1.67E-08	8.33E-04	4.52E-07
KLX 18A	060824 14:09:00	060824 16:21:00	504.00	509.00		3	1	2006-08-24 15:39:02	2006-08-24 15:59:12	3.67E-07	0	4.37E-07	1.67E-08	8.33E-04	5.24E-04
KLX 18A	060824 16:44:00	060824 17:40:00	509.00	514.00		4B	1	2006-08-24 17:21:35	2006-08-24 17:21:45	#NV	0	#NV	1.67E-08	8.33E-04	4.36E-06
KLX 18A	060824 18:02:00	060824 18:57:00	514.00	519.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 18A	060824 19:21:00	060824 20:43:00	519.00	524.00		3	1	2006-08-24 20:01:44	2006-08-24 20:21:54	1.17E-07	0	1.43E-07	1.67E-08	8.33E-04	1.72E-04
KLX 18A	060824 21:09:00	060824 22:14:00	524.00	529.00		4B	1	2006-08-24 21:46:01	2006-08-24 21:46:11	#NV	0	#NV	1.67E-08	8.33E-04	3.39E-06
KLX 18A	060824 22:37:00	060824 23:43:00	529.00	534.00		4B	1	2006-08-24 23:15:26	2006-08-24 23:15:36	#NV	0	#NV	1.67E-08	8.33E-04	4.06E-06
KLX 18A	060825 00:07:00	060825 01:32:00	534.00	539.00		3	1	2006-08-25 00:50:37	2006-08-25 01:10:47	1.62E-07	0	1.80E-07	1.67E-08	8.33E-04	2.16E-04
KLX 18A	060825 06:09:00	060825 07:44:00	539.00	544.00		3	1	2006-08-25 07:02:59	2006-08-25 07:23:09	7.20E-06	0	7.37E-06	1.67E-08	8.33E-04	8.84E-03
KLX 18A	060825 08:29:00	060825 09:59:00	544.00	549.00		3	1	2006-08-25 09:17:08	2006-08-25 09:37:18	1.13E-06	0	1.17E-06	1.67E-08	8.33E-04	1.40E-03
KLX 18A	060825 10:32:00	060825 12:27:00	549.00	554.00		3	1	2006-08-25 11:45:30	2006-08-25 12:05:40	2.00E-07	0	2.53E-07	1.67E-08	8.33E-04	3.04E-04
KLX 18A	060825 13:24:00	060825 15:03:00	554.00	559.00		3	1	2006-08-25 14:21:12	2006-08-25 14:41:22	7.50E-08	0	8.33E-08	1.67E-08	8.33E-04	1.00E-04
KLX 18A	060825 15:36:00	060825 16:54:00	559.00	564.00		3	1	2006-08-25 16:11:52	2006-08-25 16:32:02	1.27E-05	0	1.32E-05	1.67E-08	8.33E-04	1.58E-02
KLX 18A	060825 17:19:00	060825 18:40:00	564.00	569.00		3	1	2006-08-25 17:58:16	2006-08-25 18:18:26	1.72E-06	0	1.78E-06	1.67E-08	8.33E-04	2.14E-03
KLX 18A	060825 19:04:00	060825 21:13:00	569.00	574.00		4B	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 18A	060825 21:36:00	060825 22:15:00	574.00	579.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 18A	060825 22:38:00	060825 23:58:00	579.00	584.00		4B	1	2006-08-25 23:15:35	2006-08-25 23:15:45	#NV	0	#NV	1.67E-08	8.33E-04	3.97E-07
KLX 18A	060826 00:20:00	060826 01:08:00	584.00	589.00		3	1	#NV	#NV	#NV	-1	#NV	1.67E-08	8.33E-04	#NV
KLX 18A	060826 06:16:00	060826 07:46:00	589.00	594.00		3	1	2006-08-26 07:04:03	2006-08-26 07:24:13	2.35E-05	0	2.43E-05	1.67E-08	8.33E-04	2.92E-02
KLX 18A	060826 08:29:00	060826 09:53:00	594.00	599.00		3	1	2006-08-26 09:11:39	2006-08-26 09:21:49	2.80E-06	0	2.95E-06	1.67E-08	8.33E-04	3.54E-03

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 18A	389.00	394.00	1200	1200				3820	4052	3818	12.7						391.50
KLX 18A	394.00	399.00	1200	1200				3868	4068	3867	12.8						396.50
KLX 18A	399.00	404.00	1200	1200				3909	4109	3908	12.8						401.50
KLX 18A	404.00	409.00	1200	1200				3958	4181	3958	12.9						406.50
KLX 18A	409.00	414.00	1200	1200				4008	4209	4008	13.0						411.50
KLX 18A	414.00	419.00	1200	1200				4057	4257	4057	13.1						416.50
KLX 18A	419.00	424.00	1200	1200				4105	4306	4106	13.1						421.50
KLX 18A	424.00	429.00	1200	1200				4153	4353	4153	13.2						426.50
KLX 18A	429.00	434.00	1200	1200				4202	4402	4202	13.3						431.50
KLX 18A	434.00	439.00	1200	1200				4256	4455	4254	13.4						436.50
KLX 18A	439.00	444.00	10	2697				4330	4541	4445	13.5						441.50
KLX 18A	444.00	449.00	10	7234				4371	4573	4416	13.6						446.50
KLX 18A	449.00	454.00	1200	1200				4413	4630	4439	13.7						451.50
KLX 18A	454.00	459.00	1200	1200				4451	4652	4454	13.7						456.50
KLX 18A	459.00	464.00	1200	1200				4541	4763	4545	13.8						461.50
KLX 18A	464.00	469.00	1200	1200				4558	4812	4564	13.9						466.50
KLX 18A	469.00	474.00	1200	1200				4602	4802	4601	14.0						471.50
KLX 18A	474.00	479.00	1200	1200				4652	4851	4651	14.1						476.50
KLX 18A	477.00	482.00	1200	1200				4679	4880	4679	14.1						479.50
KLX 18A	482.00	487.00	1200	1200				4733	4931	4679	14.2						484.50
KLX 18A	487.00	492.00	1200	1200				4773	4974	4772	14.3						489.50
KLX 18A	489.00	494.00	1200	1200				4792	4992	4794	14.3						491.50
KLX 18A	494.00	499.00	1200	1200				4851	5052	4878	14.4						496.50
KLX 18A	499.00	504.00	10	678				4899	5153	4898	14.5						501.50
KLX 18A	504.00	509.00	1200	1200				4966	5168	4998	14.5						506.50
KLX 18A	509.00	514.00	10	696				5027	5240	5030	14.6						511.50
KLX 18A	514.00	519.00	#NV	#NV				#NV	#NV	#NV	14.7						516.50
KLX 18A	519.00	524.00	1200	1200				5098	5298	5125	14.8						521.50
KLX 18A	524.00	529.00	10	1262				5149	5356	5152	14.8						526.50
KLX 18A	529.00	534.00	10	1273				5192	5401	5194	14.9						531.50
KLX 18A	534.00	539.00	1200	1200				5233	5434	5232	15.0						536.50
KLX 18A	539.00	544.00	1200	1200				5278	5478	5278	15.1						541.50
KLX 18A	544.00	549.00	1200	1200				5329	5530	5330	15.1						546.50
KLX 18A	549.00	554.00	1200	1200				5388	5589	5398	15.2						551.50
KLX 18A	554.00	559.00	1200	1200				5437	5633	5438	15.3						556.50
KLX 18A	559.00	564.00	1200	1200				5481	5683	5482	15.3						561.50
KLX 18A	564.00	569.00	1200	1200				5530	5730	5528	15.4						566.50
KLX 18A	569.00	574.00	#NV	#NV				#NV	#NV	#NV	15.5						571.50
KLX 18A	574.00	579.00	#NV	#NV				#NV	#NV	#NV	15.6						576.50
KLX 18A	579.00	584.00	10	2025				5737	5894	5688	15.6						581.50
KLX 18A	584.00	589.00	#NV	#NV				#NV	#NV	#NV	15.7						586.50
KLX 18A	589.00	594.00	1200	1200				5766	5966	5767	15.7						591.50
KLX 18A	594.00	599.00	1200	1200				5818	6019	5818	15.9						596.50

Table	plu_s_hole_test_ed1
	PLU Single hole tests, pumping/injection. Basic evaluation

Column	Datatype	Unit	Column Description
site	CHAR		Investigation site name
activity_type	CHAR		Activity type code
start_date	DATE		Date (yymmdd hh:mm:ss)
stop_date	DATE		Date (yymmdd hh:mm:ss)
project	CHAR		project code
idcode	CHAR		Object or borehole identification code
secup	FLOAT	m	Upper section limit (m)
seclow	FLOAT	m	Lower section limit (m)
section_no	INTEGER	number	Section number
test_type	CHAR		Test type code (1-7), see table description!
formation_type	CHAR		Formation type code. 1: Rock, 2: Soil (superficial deposits)
lp	FLOAT	m	Hydraulic point of application for test section, see descr.
seclen_class	FLOAT	m	Planned ordinary test interval during test campaign.
spec_capacity_q_s	FLOAT	m**2/s	Specific capacity (Q/s) of test section, see table descript.
value_type_q_s	CHAR		0:true value,-1:Q/s<lower meas.limit,1:Q/s>upper meas.limit
transmissivity_tq	FLOAT	m**2/s	Tranmissivity based on Q/s, see table description
value_type_tq	CHAR		0:true value,-1:TQ<lower meas.limit,1:TQ>upper meas.limit.
bc_tq	CHAR		Best choice code. 1 means TQ is best choice of T, else 0
transmissivity_moye	FLOAT	m**2/s	Transmissivity,TM, based on Moye (1967)
bc_tm	CHAR		Best choice code. 1 means Tmoye is best choice of T, else 0
value_type_tm	CHAR		0:true value,-1:TM<lower meas.limit,1:TM>upper meas.limit.
hydr_cond_moye	FLOAT	m/s	K_M: Hydraulic conductivity based on Moye (1967)
formation_width_b	FLOAT	m	b:Aquifer thickness repr. for T(generally b=Lw) ,see descr.
width_of_channel_b	FLOAT	m	B:Inferred width of formation for evaluated TB
tb	FLOAT	m**3/s	TB:Flow capacity in 1D formation of T & width B, see descr.
l_measl_tb	FLOAT	m**3/s	Estimated lower meas. limit for evaluated TB,see description
u_measl_tb	FLOAT	m**3/s	Estimated upper meas. limit of evaluated TB,see description
sb	FLOAT	m	SB:S=storativity,B=width of formation,1D model,see descript.
assumed_sb	FLOAT	m	SB* : Assumed SB,S=storativity,B=width of formation,see...
leakage_factor_lf	FLOAT	m	Lf:1D model for evaluation of Leakage factor
transmissivity_tt	FLOAT	m**2/s	TT:Transmissivity of formation, 2D radial flow model,see...
value_type_tt	CHAR		0:true value,-1:TT<lower meas.limit,1:TT>upper meas.limit,
bc_tt	CHAR		Best choice code. 1 means TT is best choice of T, else 0
l_measl_q_s	FLOAT	m**2/s	Estimated lower meas. limit for evaluated TT,see table descr
u_measl_q_s	FLOAT	m**2/s	Estimated upper meas. limit for evaluated TT,see description
storativity_s	FLOAT		S:Storativity of formation based on 2D rad flow,see descr.
assumed_s	FLOAT		Assumed Storativity,2D model evaluation,see table descr.
bc_s	FLOAT		Best choice of S (Storativity) ,see descr.
ri	FLOAT	m	Radius of influence
ri_index	CHAR		ri index=index of radius of influence :-1,0 or 1, see descr.
leakage_coeff	FLOAT	1/s	K'/b':2D rad flow model evaluation of leakage coeff,see desc
hydr_cond_ksf	FLOAT	m/s	Ksf:3D model evaluation of hydraulic conductivity,see desc.
value_type_ksf	CHAR		0:true value,-1:Ksf<lower meas.limit,1:Ksf>upper meas.limit,
l_measl_ksf	FLOAT	m/s	Estimated lower meas.limit for evaluated Ksf,see table desc.
u_measl_ksf	FLOAT	m/s	Estimated upper meas.limit for evaluated Ksf,see table descr
spec_storage_ssf	FLOAT	1/m	Ssf:Specific storage,3D model evaluation,see table descr.
assumed_ssf	FLOAT	1/m	Ssf*:Assumed Spec.storage,3D model evaluation,see table des.
c	FLOAT	m**3/pa	C: Wellbore storage coefficient; flow or recovery period
cd	FLOAT		CD: Dimensionless wellbore storage coefficient
skin	FLOAT		Skin factor;best estimate of flow/recovery period,see descr.
dt1	FLOAT	s	Estimated start time of evaluation, see table description
dt2	FLOAT	s	Estimated stop time of evaluation. see table description
t1	FLOAT	s	Start time for evaluated parameter from start flow period
t2	FLOAT	s	Stop time for evaluated parameter from start of flow period
dte1	FLOAT	s	Start time for evaluated parameter from start of recovery
dte2	FLOAT	s	Stop time for evaluated parameter from start of recovery
p_horner	FLOAT	kPa	p*:Horner extrapolated pressure, see table description
transmissivity_t_nlr	FLOAT	m**2/s	T_NLR Transmissivity based on None Linear Regression...
storativity_s_nlr	FLOAT		S_NLR=storativity based on None Linear Regression,see..
value_type_t_nlr	CHAR		0:true value,-1:T_NLR<lower meas.limit,1:>upper meas.limit
bc_t_nlr	CHAR		Best choice code. 1 means T_NLR is best choice of T, else 0
c_nlr	FLOAT	m**3/pa	Wellbore storage coefficient, based on NLR, see descr.
cd_nlr	FLOAT		Dimensionless wellbore storage constant, see table descrip.
skin_nlr	FLOAT		Skin factor based on Non Linear Regression,see desc.
transmissivity_t_grf	FLOAT	m**2/s	T_GRF:Transmissivity based on Genelized Radial Flow,see...
value_type_t_grf	CHAR		0:true value,-1:T_GRF<lower meas.limit,1:>upper meas.limit
bc_t_grf	CHAR		Best choice code. 1 means T_GRF is best choice of T, else 0
storativity_s_grf	FLOAT		S_GRF:Storativity based on Generalized Radial Flow, see des.
flow_dim_grf	FLOAT		Inferred flow dimesion based on Generalized Rad. Flow model
comment	VARCHAR	no_unit	Short comment to the evaluated parameters
error_flag	CHAR		If error_flag = "*" then an error occured and an error
in_use	CHAR		If in_use = "*" then the activity has been selected as
sign	CHAR		Signature for QA data accknowledge (QA - OK)

idcode	start_date	stop_date	secup	seclow	section_no	test_type	formation_type	lp	seclen_class	spec_capacity_q_s	value_type_q_s	transmissivity_tq	value_type_tq	bc_tq	transmissivity_moye
KLX 18A	060815 10:44:00	060815 12:10:00	104.00	204.00		3	1	154.00	100	6.98E-06	0				9.09E-06
KLX 18A	060815 14:05:00	060815 16:10:00	204.00	304.00		3	1	254.00	100	6.62E-08	0				8.61E-08
KLX 18A	060815 17:25:00	060815 19:19:00	304.00	404.00		3	1	354.00	100	2.78E-06	0				3.62E-06
KLX 18A	060815 21:08:00	060815 23:01:00	404.00	504.00		3	1	454.00	100	3.18E-06	0				4.12E-06
KLX 18A	060816 07:34:00	060816 09:40:00	504.00	604.00		3	1	554.00	100	2.07E-06	0				2.70E-06
KLX 18A	060816 19:58:00	060816 21:22:00	104.00	124.00		3	1	114.00	20	7.75E-06	0				8.11E-06
KLX 18A	060816 22:02:00	060816 23:27:00	124.00	144.00		3	1	134.00	20	2.27E-06	0				2.37E-06
KLX 18A	060816 23:59:00	060817 01:27:00	144.00	164.00		3	1	154.00	20	3.25E-07	0				3.40E-07
KLX 18A	060817 06:38:00	060817 08:23:00	164.00	184.00		3	1	174.00	20	8.73E-09	0				9.13E-09
KLX 18A	060817 09:06:00	060817 10:48:00	184.00	204.00		3	1	194.00	20	4.01E-09	0				4.20E-09
KLX 18A	060817 11:27:00	060817 13:32:00	204.00	224.00		3	1	214.00	20	3.19E-09	0				3.34E-09
KLX 18A	060817 14:08:00	060817 16:08:00	224.00	244.00		4B	1	234.00	20	#NV	-1				#NV
KLX 18A	060817 16:43:00	060817 18:16:00	244.00	264.00		3	1	254.00	20	5.75E-08	0				6.02E-08
KLX 18A	060817 18:46:00	060817 20:28:00	264.00	284.00		3	1	274.00	20	4.52E-09	0				4.73E-09
KLX 18A	060817 21:22:00	060817 23:01:00	284.00	304.00		3	1	294.00	20	2.93E-09	0				3.07E-09
KLX 18A	060817 23:30:00	060818 00:54:00	304.00	324.00		3	1	314.00	20	8.17E-06	0				8.54E-06
KLX 18A	060818 01:24:00	060818 02:47:00	324.00	344.00		3	1	334.00	20	9.32E-07	0				9.75E-07
KLX 18A	060818 06:29:00	060818 08:03:00	344.00	364.00		3	1	354.00	20	1.44E-06	0				1.51E-06
KLX 18A	060818 08:34:00	060818 10:01:00	364.00	384.00		3	1	374.00	20	4.50E-07	0				4.71E-07
KLX 18A	060818 10:38:00	060818 12:07:00	384.00	404.00		3	1	394.00	20	4.05E-07	0				4.24E-07
KLX 18A	060818 13:16:00	060818 14:45:00	404.00	424.00		3	1	414.00	20	1.82E-06	0				1.90E-06
KLX 18A	060818 15:16:00	060818 16:46:00	424.00	444.00		3	1	434.00	20	2.17E-06	0				2.27E-06
KLX 18A	060818 17:20:00	060818 18:44:00	444.00	464.00		3	1	454.00	20	7.23E-08	0				7.56E-08
KLX 18A	060818 19:19:00	060818 20:35:00	464.00	484.00		3	1	474.00	20	6.24E-08	0				6.53E-08
KLX 18A	060819 00:45:00	060819 04:09:00	484.00	504.00		3	1	494.00	20	2.31E-08	0				2.41E-08
KLX 18A	060819 06:24:00	060819 08:12:00	504.00	524.00		3	1	514.00	20	2.31E-08	0				2.41E-08
KLX 18A	060819 08:45:00	060819 10:16:00	524.00	544.00		3	1	534.00	20	2.70E-07	0				2.83E-07
KLX 18A	060819 10:56:00	060819 12:36:00	544.00	564.00		3	1	554.00	20	5.85E-07	0				6.11E-07
KLX 18A	060819 13:29:00	060819 14:56:00	564.00	584.00		3	1	574.00	20	7.02E-08	0				7.35E-08
KLX 18A	060819 15:30:00	060819 16:51:00	584.00	604.00		3	1	594.00	20	1.14E-06	0				1.20E-06
KLX 18A	060820 08:53:00	060820 10:28:00	299.00	304.00		3	1	301.50	5	1.09E-09	0				9.00E-10
KLX 18A	060820 10:58:00	060820 12:56:00	304.00	309.00		4B	1	306.50	5	#NV	-1				#NV
KLX 18A	060820 13:33:00	060820 15:04:00	309.00	314.00		3	1	311.50	5	1.42E-09	0				1.17E-09
KLX 18A	060820 15:29:00	060820 16:27:00	314.00	319.00		4B	1	316.50	5	#NV	-1				#NV
KLX 18A	060820 16:52:00	060820 18:12:00	319.00	324.00		3	1	321.50	5	2.96E-08	0				2.44E-08
KLX 18A	060820 18:35:00	060820 19:31:00	324.00	329.00		4B	1	326.50	5	#NV	-1				#NV
KLX 18A	060820 19:53:00	060820 21:14:00	329.00	334.00		3	1	331.50	5	2.44E-07	0				2.01E-07
KLX 18A	060820 21:58:00	060820 23:46:00	334.00	339.00		3	1	336.50	5	4.58E-07	0				3.78E-07
KLX 18A	060821 00:08:00	060821 01:31:00	339.00	344.00		3	1	341.50	5	2.11E-07	0				1.75E-07
KLX 18A	060821 01:55:00	060821 03:24:00	344.00	349.00		3	1	346.50	5	1.08E-06	0				8.93E-07
KLX 18A	060821 06:23:00	060821 08:08:00	349.00	354.00		3	1	351.50	5	2.45E-08	0				2.02E-08
KLX 18A	060821 08:44:00	060821 10:08:00	354.00	359.00		4B	1	356.50	5	#NV	-1				#NV
KLX 18A	060821 10:37:00	060821 12:02:00	359.00	364.00		3	1	361.50	5	3.90E-07	0				3.22E-07
KLX 18A	060821 13:02:00	060821 14:22:00	364.00	369.00		3	1	366.50	5	3.78E-07	0				3.12E-07
KLX 18A	060821 15:02:00	060821 16:20:00	369.00	374.00		3	1	371.50	5	1.71E-07	0				1.41E-07
KLX 18A	060821 16:42:00	060821 18:05:00	374.00	379.00		3	1	376.50	5	1.14E-07	0				9.45E-08
KLX 18A	060821 18:28:00	060821 19:48:00	379.00	384.00		3	1	381.50	5	6.33E-08	0				5.22E-08
KLX 18A	060821 20:20:00	060821 21:41:00	384.00	389.00		3	1	386.50	5	9.86E-08	0				8.14E-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 18A	104.00	204.00	0	0	9.09E-08									7.80E-06	0	1	5.00E-06	1.00E-05
KLX 18A	204.00	304.00	0	0	8.61E-10									1.50E-08	0	1	8.00E-09	3.00E-08
KLX 18A	304.00	404.00	0	0	3.62E-08									5.09E-06	0	1	2.00E-06	8.00E-06
KLX 18A	404.00	504.00	0	0	4.12E-08									6.10E-06	0	1	2.00E-06	9.00E-06
KLX 18A	504.00	604.00	0	0	2.70E-08									2.69E-06	0	1	9.00E-07	5.00E-06
KLX 18A	104.00	124.00	0	0	4.06E-07									8.12E-06	0	1	6.00E-06	2.00E-05
KLX 18A	124.00	144.00	0	0	1.19E-07									5.05E-06	0	1	2.00E-06	8.00E-06
KLX 18A	144.00	164.00	0	0	1.70E-08									2.50E-07	0	1	9.00E-08	5.00E-07
KLX 18A	164.00	184.00	0	0	4.57E-10									8.16E-09	0	1	5.00E-09	1.00E-08
KLX 18A	184.00	204.00	0	0	2.10E-10									3.43E-09	0	1	1.00E-09	6.00E-09
KLX 18A	204.00	224.00	0	0	1.67E-10									6.35E-09	0	1	2.00E-09	9.00E-09
KLX 18A	224.00	244.00	0	-1	#NV									9.29E-11	-1	1	6.00E-11	2.00E-10
KLX 18A	244.00	264.00	0	0	3.01E-09									1.76E-08	0	1	9.00E-09	6.00E-08
KLX 18A	264.00	284.00	0	0	2.37E-10									6.89E-09	0	1	3.00E-09	9.00E-09
KLX 18A	284.00	304.00	0	0	1.54E-10									3.65E-09	0	1	9.00E-10	6.00E-09
KLX 18A	304.00	324.00	0	0	4.27E-07									2.12E-07	0	1	8.00E-08	5.00E-07
KLX 18A	324.00	344.00	0	0	4.88E-08									5.67E-06	0	1	2.00E-06	9.00E-06
KLX 18A	344.00	364.00	0	0	7.55E-08									9.34E-06	0	1	3.00E-06	3.00E-05
KLX 18A	364.00	384.00	0	0	2.36E-08									2.06E-06	0	1	9.00E-07	5.00E-06
KLX 18A	384.00	404.00	0	0	2.12E-08									1.87E-06	0	1	8.00E-07	4.00E-06
KLX 18A	404.00	424.00	0	0	9.50E-08									7.31E-06	0	1	2.00E-06	1.00E-05
KLX 18A	424.00	444.00	0	0	1.14E-07									9.86E-06	0	1	4.00E-06	3.00E-05
KLX 18A	444.00	464.00	0	0	3.78E-09									6.48E-08	0	1	3.00E-08	9.00E-08
KLX 18A	464.00	484.00	0	0	3.27E-09									1.12E-07	0	1	7.00E-08	3.00E-07
KLX 18A	484.00	504.00	0	0	1.21E-09									1.61E-09	0	1	9.00E-10	5.00E-09
KLX 18A	504.00	524.00	0	0	1.21E-09									1.69E-08	0	1	8.00E-09	4.00E-08
KLX 18A	524.00	544.00	0	0	1.42E-08									6.75E-07	0	1	1.00E-07	1.00E-06
KLX 18A	544.00	564.00	0	0	3.06E-08									5.46E-07	0	1	1.00E-07	9.00E-07
KLX 18A	564.00	584.00	0	0	3.68E-09									4.40E-07	0	1	1.00E-07	8.00E-07
KLX 18A	584.00	604.00	0	0	6.00E-08									1.55E-06	0	1	8.00E-07	3.00E-06
KLX 18A	299.00	304.00	0	0	1.80E-10									6.46E-09	0	1	1.00E-09	1.00E-08
KLX 18A	304.00	309.00	0	-1	#NV									1.34E-11	-1	1	2.00E-12	3.00E-11
KLX 18A	309.00	314.00	0	0	2.34E-10									9.72E-09	0	1	6.00E-09	4.00E-08
KLX 18A	314.00	319.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 18A	319.00	324.00	0	0	4.88E-09									7.25E-08	0	1	4.00E-08	2.00E-07
KLX 18A	324.00	329.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 18A	329.00	334.00	0	0	4.02E-08									4.08E-07	0	1	1.00E-07	7.00E-07
KLX 18A	334.00	339.00	0	0	7.56E-08									7.00E-06	0	1	1.00E-06	1.00E-05
KLX 18A	339.00	344.00	0	0	3.50E-08									3.15E-07	0	1	9.00E-08	6.00E-07
KLX 18A	344.00	349.00	0	0	1.79E-07									2.27E-06	0	1	8.00E-07	6.00E-06
KLX 18A	349.00	354.00	0	0	4.04E-09									1.02E-07	0	1	5.00E-08	5.00E-07
KLX 18A	354.00	359.00	0	-1	#NV									7.88E-10	-1	1	3.00E-10	9.00E-10
KLX 18A	359.00	364.00	0	0	6.44E-08									1.16E-06	0	1	7.00E-07	6.00E-06
KLX 18A	364.00	369.00	0	0	6.24E-08									1.34E-06	0	1	7.00E-07	3.00E-06
KLX 18A	369.00	374.00	0	0	2.82E-08									4.21E-07	0	1	3.00E-07	1.00E-06
KLX 18A	374.00	379.00	0	0	1.89E-08									1.55E-07	0	1	7.00E-08	3.00E-07
KLX 18A	379.00	384.00	0	0	1.04E-08									2.88E-07	0	1	9.00E-08	5.00E-07
KLX 18A	384.00	389.00	0	0	1.63E-08									4.51E-07	0	1	1.00E-07	9.00E-07

idcode	secup	seclow	storativity_s	assumed_s	bc_s	ri	ri_index	leakage_coeff	hydr_cond_ksf	value_type_ksf	l_measl_ksf	u_measl_ksf	spec_storage_ssf	assumed_ssf	c	cd	skin	dt1	dt2
KLX 18A	104.00	204.00	1.00E-06	1.00E-06		50.65	-1								4.83E-09	5.3E-01	-1.28	54.0	180.0
KLX 18A	204.00	304.00	1.00E-06	1.00E-06		25.94	-1								1.49E-10	1.6E-02	-3.79	360.0	1080.0
KLX 18A	304.00	404.00	1.00E-06	1.00E-06		143.96	0								9.57E-10	1.1E-01	3.13	36.0	1080.0
KLX 18A	404.00	504.00	1.00E-06	1.00E-06		150.87	0								2.06E-09	2.3E-01	3.66	108.0	1080.0
KLX 18A	504.00	604.00	1.00E-06	1.00E-06		30.07	-1								1.57E-09	1.7E-01	0.89	19.8	108.0
KLX 18A	104.00	124.00	1.00E-06	1.00E-06		42.80	-1								5.27E-09	5.8E-01	-1.27	21.6	126.0
KLX 18A	124.00	144.00	1.00E-06	1.00E-06		117.31	0								1.56E-09	1.7E-01	5.76	19.8	1080.0
KLX 18A	144.00	164.00	1.00E-06	1.00E-06		28.72	-1								3.93E-11	4.3E-03	-1.81	23.4	324.0
KLX 18A	164.00	184.00	1.00E-06	1.00E-06		23.52	0								5.55E-11	6.1E-03	0.25	108.0	540.0
KLX 18A	184.00	204.00	1.00E-06	1.00E-06		18.94	0								8.16E-11	9.0E-03	0.06	324.0	720.0
KLX 18A	204.00	224.00	1.00E-06	1.00E-06		35.27	0								6.81E-11	7.5E-03	4.76	324.0	900.0
KLX 18A	224.00	244.00	1.00E-06	1.00E-06		13.53	0								7.91E-11	8.7E-03	-2.40	32.4	1980.0
KLX 18A	244.00	264.00	1.00E-06	1.00E-06		9.87	0								6.58E-12	7.3E-04	-3.20	16.8	144.0
KLX 18A	264.00	284.00	1.00E-06	1.00E-06		5.52	1								6.04E-11	6.7E-03	-0.92	14.4	72.0
KLX 18A	284.00	304.00	1.00E-06	1.00E-06		19.23	-1								6.39E-11	7.0E-03	2.49	90.0	540.0
KLX 18A	304.00	324.00	1.00E-06	1.00E-06		53.10	0								5.24E-11	5.8E-03	32.50	72.0	432.0
KLX 18A	324.00	344.00	1.00E-06	1.00E-06		15.54	0								1.86E-10	2.1E-02	1.95	36.0	540.0
KLX 18A	344.00	364.00	1.00E-06	1.00E-06		136.80	0								1.73E-10	1.9E-02	7.68	9.0	540.0
KLX 18A	364.00	384.00	1.00E-06	1.00E-06		93.75	0								2.23E-10	2.5E-02	20.28	36.0	540.0
KLX 18A	384.00	404.00	1.00E-06	1.00E-06		91.51	0								1.17E-10	1.3E-02	20.61	21.6	540.0
KLX 18A	404.00	424.00	1.00E-06	1.00E-06		18.88	0								5.35E-10	5.9E-02	1.24	46.8	540.0
KLX 18A	424.00	444.00	1.00E-06	1.00E-06		138.67	0								4.43E-10	4.9E-02	19.90	18.0	540.0
KLX 18A	444.00	464.00	1.00E-06	1.00E-06		39.48	0								1.33E-10	1.5E-02	-0.20	90.0	432.0
KLX 18A	464.00	484.00	1.00E-06	1.00E-06		45.27	0								6.61E-11	7.3E-03	4.80	61.2	540.0
KLX 18A	484.00	504.00	1.00E-06	1.00E-06		38.40	1								1.58E-09	1.7E-01	-4.32	1980.0	6480.0
KLX 18A	504.00	524.00	1.00E-06	1.00E-06		28.21	-1								4.75E-10	5.2E-02	-1.97	198.0	612.0
KLX 18A	524.00	544.00	1.00E-06	1.00E-06		70.93	0								6.40E-11	7.1E-03	8.40	34.2	1080.0
KLX 18A	544.00	564.00	1.00E-06	1.00E-06		27.32	-1								1.00E-09	1.1E-01	-2.18	16.2	198.0
KLX 18A	564.00	584.00	1.00E-06	1.00E-06		63.84	0								8.78E-11	9.7E-03	32.30	61.2	468.0
KLX 18A	584.00	604.00	1.00E-06	1.00E-06		19.72	0								3.44E-10	3.8E-02	3.78	10.8	61.2
KLX 18A	299.00	304.00	1.00E-06	1.00E-06		22.19	-1								1.02E-11	1.1E-03	33.30	360.0	540.0
KLX 18A	304.00	309.00	1.00E-06	1.00E-06		3.38	1								1.45E-11	1.6E-03	-0.95	43.2	612.0
KLX 18A	309.00	314.00	1.00E-06	1.00E-06		24.57	-1								1.27E-11	1.4E-03	33.23	180.0	540.0
KLX 18A	314.00	319.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 18A	319.00	324.00	1.00E-06	1.00E-06		40.61	0								2.07E-11	2.3E-03	9.70	54.0	540.0
KLX 18A	324.00	329.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 18A	329.00	334.00	1.00E-06	1.00E-06		62.54	0								3.19E-10	3.5E-02	3.63	23.4	1080.0
KLX 18A	334.00	339.00	1.00E-06	1.00E-06		6.59	0								3.78E-11	4.2E-03	15.40	7.2	540.0
KLX 18A	339.00	344.00	1.00E-06	1.00E-06		32.31	0								5.67E-11	6.2E-03	11.30	252.0	1080.0
KLX 18A	344.00	349.00	1.00E-06	1.00E-06		96.05	0								1.28E-10	1.4E-02	5.66	21.6	1080.0
KLX 18A	349.00	354.00	1.00E-06	1.00E-06		44.22	0								1.51E-11	1.7E-03	1.91	36.0	540.0
KLX 18A	354.00	359.00	1.00E-06	1.00E-06		4.95	-1								#NV	#NV	-0.12	108.0	1980.0
KLX 18A	359.00	364.00	1.00E-06	1.00E-06		81.21	0								2.86E-11	3.2E-03	32.82	43.2	900.0
KLX 18A	364.00	369.00	1.00E-06	1.00E-06		84.19	0								5.75E-11	6.3E-03	8.23	12.6	540.0
KLX 18A	369.00	374.00	1.00E-06	1.00E-06		63.03	0								3.68E-11	4.1E-03	9.05	14.4	540.0
KLX 18A	374.00	379.00	1.00E-06	1.00E-06		34.40	1								1.57E-11	1.7E-03	8.54	432.0	1080.0
KLX 18A	379.00	384.00	1.00E-06	1.00E-06		57.33	0								2.19E-11	2.4E-03	21.40	25.2	540.0
KLX 18A	384.00	389.00	1.00E-06	1.00E-06		64.13	0								2.68E-11	3.0E-03	21.30	25.2	540.0

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 18A	104.00	204.00					1983.6													
KLX 18A	204.00	304.00					2938.0													
KLX 18A	304.00	404.00					3915.6													
KLX 18A	404.00	504.00					4880.5													
KLX 18A	504.00	604.00					5864.1													
KLX 18A	104.00	124.00					1203.3													
KLX 18A	124.00	144.00					1402.9													
KLX 18A	144.00	164.00					1590.5													
KLX 18A	164.00	184.00					1792.0													
KLX 18A	184.00	204.00					1963.3													
KLX 18A	204.00	224.00					2168.7													
KLX 18A	224.00	244.00					#NV													
KLX 18A	244.00	264.00					2543.4													
KLX 18A	264.00	284.00					2750.4													
KLX 18A	284.00	304.00					2938.4													
KLX 18A	304.00	324.00					3135.0													
KLX 18A	324.00	344.00					3330.2													
KLX 18A	344.00	364.00					3524.4													
KLX 18A	364.00	384.00					3720.6													
KLX 18A	384.00	404.00					3913.3													
KLX 18A	404.00	424.00					4107.1													
KLX 18A	424.00	444.00					4300.9													
KLX 18A	444.00	464.00					4494.7													
KLX 18A	464.00	484.00					4695.3													
KLX 18A	484.00	504.00					4895.4													
KLX 18A	504.00	524.00					5096.4													
KLX 18A	524.00	544.00					5279.7													
KLX 18A	544.00	564.00					5477.6													
KLX 18A	564.00	584.00					5673.7													
KLX 18A	584.00	604.00					5869.7													
KLX 18A	299.00	304.00					2942.8													
KLX 18A	304.00	309.00					#NV													
KLX 18A	309.00	314.00					3037.7													
KLX 18A	314.00	319.00					#NV													
KLX 18A	319.00	324.00					3138.9													
KLX 18A	324.00	329.00					#NV													
KLX 18A	329.00	334.00					3234.0													
KLX 18A	334.00	339.00					3283.3													
KLX 18A	339.00	344.00					3332.1													
KLX 18A	344.00	349.00					3380.4													
KLX 18A	349.00	354.00					3428.1													
KLX 18A	354.00	359.00					#NV													
KLX 18A	359.00	364.00					3527.2													
KLX 18A	364.00	369.00					3573.6													
KLX 18A	369.00	374.00					3630.7													
KLX 18A	374.00	379.00					3675.2													
KLX 18A	379.00	384.00					3721.3													
KLX 18A	384.00	389.00					3769.1													

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 18A	060821 22:03:00	060821 23:33:00	389.00	394.00		3	1	391.50	5	2.40E-09	0				1.98E-09
KLX 18A	060821 23:59:00	060822 01:29:00	394.00	399.00		3	1	396.50	5	1.23E-08	0				1.01E-08
KLX 18A	060822 06:19:00	060822 07:37:00	399.00	404.00		3	1	401.50	5	3.08E-07	0				2.54E-07
KLX 18A	060822 08:10:00	060822 09:32:00	404.00	409.00		3	1	406.50	5	2.00E-08	0				1.65E-08
KLX 18A	060822 10:09:00	060822 11:36:00	409.00	414.00		3	1	411.50	5	3.17E-08	0				2.62E-08
KLX 18A	060822 14:07:00	060822 15:25:00	414.00	419.00		3	1	416.50	5	2.02E-07	0				1.67E-07
KLX 18A	060822 15:59:00	060822 17:19:00	419.00	424.00		3	1	421.50	5	1.62E-06	0				1.34E-06
KLX 18A	060822 17:42:00	060822 19:08:00	424.00	429.00		3	1	426.50	5	1.16E-06	0				9.58E-07
KLX 18A	060822 19:32:00	060822 20:54:00	429.00	434.00		3	1	431.50	5	1.15E-06	0				9.51E-07
KLX 18A	060822 21:24:00	060822 22:46:00	434.00	439.00		3	1	436.50	5	3.20E-08	0				2.64E-08
KLX 18A	060822 23:10:00	060823 00:35:00	439.00	444.00		4B	1	441.50	5	#NV	-1				#NV
KLX 18A	060823 01:02:00	060823 03:40:00	444.00	449.00		4B	1	446.50	5	#NV	-1				#NV
KLX 18A	060823 06:23:00	060823 08:04:00	449.00	454.00		3	1	451.50	5	1.19E-09	0				9.83E-10
KLX 18A	060823 08:37:00	060823 10:04:00	454.00	459.00		3	1	456.50	5	7.35E-08	0				6.06E-08
KLX 18A	060823 10:41:00	060823 12:04:00	459.00	464.00		3	1	461.50	5	7.36E-10	0				6.08E-10
KLX 18A	060823 13:31:00	060823 15:05:00	464.00	469.00		3	1	466.50	5	1.03E-09	0				8.50E-10
KLX 18A	060823 16:36:00	060823 17:54:00	469.00	474.00		3	1	471.50	5	1.47E-08	0				1.21E-08
KLX 18A	060823 18:19:00	060823 19:37:00	474.00	479.00		3	1	476.50	5	6.57E-08	0				5.43E-08
KLX 18A	060823 20:08:00	060823 21:32:00	477.00	482.00		3	1	479.50	5	8.95E-09	0				7.39E-09
KLX 18A	060823 21:55:00	060823 23:32:00	482.00	487.00		3	1	484.50	5	4.62E-08	0				3.82E-08
KLX 18A	060823 23:55:00	060824 01:21:00	487.00	492.00		3	1	489.50	5	2.67E-08	0				2.20E-08
KLX 18A	060824 06:23:00	060824 07:59:00	489.00	494.00		3	1	491.50	5	3.59E-08	0				2.96E-08
KLX 18A	060824 08:48:00	060824 10:28:00	494.00	499.00		3	1	496.50	5	3.50E-09	0				2.89E-09
KLX 18A	060824 11:04:00	060824 12:08:00	499.00	504.00		4B	1	501.50	5	#NV	-1				#NV
KLX 18A	060824 14:09:00	060824 16:21:00	504.00	509.00		3	1	506.50	5	1.78E-08	0				1.47E-08
KLX 18A	060824 16:44:00	060824 17:40:00	509.00	514.00		4B	1	511.50	5	#NV	-1				#NV
KLX 18A	060824 18:02:00	060824 18:57:00	514.00	519.00		3	1	516.50	5	#NV	-1				#NV
KLX 18A	060824 19:21:00	060824 20:43:00	519.00	524.00		3	1	521.50	5	5.72E-09	0				4.72E-09
KLX 18A	060824 21:09:00	060824 22:14:00	524.00	529.00		4B	1	526.50	5	#NV	-1				#NV
KLX 18A	060824 22:37:00	060824 23:43:00	529.00	534.00		4B	1	531.50	5	#NV	-1				#NV
KLX 18A	060825 00:07:00	060825 01:32:00	534.00	539.00		3	1	536.50	5	7.89E-09	0				6.51E-09
KLX 18A	060825 06:09:00	060825 07:44:00	539.00	544.00		3	1	541.50	5	3.53E-07	0				2.92E-07
KLX 18A	060825 08:29:00	060825 09:59:00	544.00	549.00		3	1	546.50	5	5.53E-08	0				4.57E-08
KLX 18A	060825 10:32:00	060825 12:27:00	549.00	554.00		3	1	551.50	5	9.76E-09	0				8.06E-09
KLX 18A	060825 13:24:00	060825 15:03:00	554.00	559.00		3	1	556.50	5	3.75E-09	0				3.10E-09
KLX 18A	060825 15:36:00	060825 16:54:00	559.00	564.00		3	1	561.50	5	6.15E-07	0				5.08E-07
KLX 18A	060825 17:19:00	060825 18:40:00	564.00	569.00		3	1	566.50	5	8.42E-08	0				6.95E-08
KLX 18A	060825 19:04:00	060825 21:13:00	569.00	574.00		4B	1	571.50	5	#NV	-1				#NV
KLX 18A	060825 21:36:00	060825 22:15:00	574.00	579.00		3	1	576.50	5	#NV	-1				#NV
KLX 18A	060825 22:38:00	060825 23:58:00	579.00	584.00		4B	1	581.50	5	#NV	-1				#NV
KLX 18A	060826 00:20:00	060826 01:08:00	584.00	589.00		3	1	586.50	5	#NV	-1				#NV
KLX 18A	060826 06:16:00	060826 07:46:00	589.00	594.00		3	1	591.50	5	1.15E-06	0				9.51E-07
KLX 18A	060826 08:29:00	060826 09:53:00	594.00	599.00		3	1	596.50	5	1.37E-07	0				1.13E-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 18A	389.00	394.00	0	0	3.96E-10									1.97E-09	0	1	9.00E-10	1.00E-08
KLX 18A	394.00	399.00	0	0	2.02E-09									5.45E-08	0	1	1.00E-08	8.00E-08
KLX 18A	399.00	404.00	0	0	5.08E-08									7.03E-07	0	1	3.00E-07	1.00E-06
KLX 18A	404.00	409.00	0	0	3.30E-09									2.90E-08	0	1	9.00E-09	5.00E-08
KLX 18A	409.00	414.00	0	0	5.24E-09									8.03E-08	0	1	5.00E-08	1.00E-07
KLX 18A	414.00	419.00	0	0	3.34E-08									8.80E-07	0	1	4.00E-07	2.00E-06
KLX 18A	419.00	424.00	0	0	2.68E-07									7.15E-06	0	1	3.00E-06	1.00E-05
KLX 18A	424.00	429.00	0	0	1.92E-07									3.39E-06	0	1	5.00E-07	7.00E-06
KLX 18A	429.00	434.00	0	0	1.90E-07									5.16E-06	0	1	8.00E-07	9.00E-06
KLX 18A	434.00	439.00	0	0	5.28E-09									2.56E-08	0	1	9.00E-09	6.00E-08
KLX 18A	439.00	444.00	0	-1	#NV									6.16E-11	-1	1	1.00E-11	9.00E-11
KLX 18A	444.00	449.00	0	-1	#NV									1.04E-11	-1	1	7.00E-12	3.00E-11
KLX 18A	449.00	454.00	0	0	1.97E-10									4.20E-10	0	1	1.00E-10	7.00E-10
KLX 18A	454.00	459.00	0	0	1.21E-08									6.52E-08	0	1	3.00E-08	1.00E-07
KLX 18A	459.00	464.00	0	0	1.22E-10									3.47E-10	0	1	9.00E-11	6.00E-10
KLX 18A	464.00	469.00	0	0	1.70E-10									7.59E-10	0	1	4.00E-10	2.00E-09
KLX 18A	469.00	474.00	0	0	2.42E-09									6.43E-08	0	1	1.00E-08	9.00E-08
KLX 18A	474.00	479.00	0	0	1.09E-08									9.88E-08	0	1	7.00E-08	3.00E-07
KLX 18A	477.00	482.00	0	0	1.48E-09									3.17E-08	0	1	7.00E-09	7.00E-08
KLX 18A	482.00	487.00	0	0	7.64E-09									2.64E-08	0	1	7.00E-09	5.00E-08
KLX 18A	487.00	492.00	0	0	4.40E-09									4.40E-08	0	1	1.00E-08	9.00E-08
KLX 18A	489.00	494.00	0	0	5.92E-09									2.46E-08	0	1	9.00E-09	4.00E-08
KLX 18A	494.00	499.00	0	0	5.78E-10									3.50E-09	0	1	1.00E-09	5.00E-09
KLX 18A	499.00	504.00	0	-1	#NV									9.93E-11	-1	1	7.00E-11	2.00E-10
KLX 18A	504.00	509.00	0	0	2.94E-09									1.59E-08	0	1	8.00E-09	4.00E-08
KLX 18A	509.00	514.00	0	-1	#NV									1.89E-09	-1	1	1.00E-10	3.00E-09
KLX 18A	514.00	519.00	0	-1	#NV									1.00E-10	-1	1	1.00E-11	8.00E-10
KLX 18A	519.00	524.00	0	0	9.44E-10									1.52E-08	0	1	8.00E-09	4.00E-08
KLX 18A	524.00	529.00	0	-1	#NV									6.11E-10	-1	1	1.00E-10	8.00E-10
KLX 18A	529.00	534.00	0	-1	#NV									7.24E-10	-1	1	1.00E-10	9.00E-10
KLX 18A	534.00	539.00	0	0	1.30E-09									8.80E-09	0	1	4.00E-09	3.00E-08
KLX 18A	539.00	544.00	0	0	5.84E-08									1.60E-06	0	1	7.00E-07	3.00E-06
KLX 18A	544.00	549.00	0	0	9.14E-09									9.05E-08	0	1	6.00E-08	4.00E-07
KLX 18A	549.00	554.00	0	0	1.61E-09									9.75E-09	0	1	1.00E-09	2.00E-08
KLX 18A	554.00	559.00	0	0	6.20E-10									1.86E-09	0	1	8.00E-10	5.00E-09
KLX 18A	559.00	564.00	0	0	1.02E-07									4.64E-07	0	1	1.00E-07	7.00E-07
KLX 18A	564.00	569.00	0	0	1.39E-08									1.49E-07	0	1	7.00E-08	5.00E-07
KLX 18A	569.00	574.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 18A	574.00	579.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 18A	579.00	584.00	0	-1	#NV									1.41E-11	-1	1	9.00E-12	6.00E-11
KLX 18A	584.00	589.00	0	-1	#NV									1.00E-11	-1	1	1.00E-13	1.00E-11
KLX 18A	589.00	594.00	0	0	1.90E-07									1.55E-06	0	1	8.00E-07	5.00E-06
KLX 18A	594.00	599.00	0	0	2.26E-08									2.64E-07	0	1	8.00E-08	5.00E-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 18A	389.00	394.00	1.00E-06	1.00E-06		4.95	1								1.46E-11	1.6E-03	-0.06	10.8	108.0
KLX 18A	394.00	399.00	1.00E-06	1.00E-06		37.81	0								2.00E-11	2.2E-03	21.50	108.0	540.0
KLX 18A	399.00	404.00	1.00E-06	1.00E-06		24.82	1								3.13E-11	3.4E-03	6.55	18.0	144.0
KLX 18A	404.00	409.00	1.00E-06	1.00E-06		9.67	1								2.79E-11	3.1E-03	2.63	18.0	108.0
KLX 18A	409.00	414.00	1.00E-06	1.00E-06		12.50	1								1.11E-11	1.2E-03	8.16	14.4	108.0
KLX 18A	414.00	419.00	1.00E-06	1.00E-06		75.79	0								5.58E-11	6.2E-03	21.00	28.8	540.0
KLX 18A	419.00	424.00	1.00E-06	1.00E-06		127.96	0								6.05E-10	6.7E-02	19.80	32.4	540.0
KLX 18A	424.00	429.00	1.00E-06	1.00E-06		36.78	1								1.88E-10	2.1E-02	9.73	21.6	144.0
KLX 18A	429.00	434.00	1.00E-06	1.00E-06		117.94	0								3.16E-10	3.5E-02	20.10	36.0	540.0
KLX 18A	434.00	439.00	1.00E-06	1.00E-06		6.64	-1								1.93E-11	2.1E-03	0.80	16.2	54.0
KLX 18A	439.00	444.00	1.00E-06	1.00E-06		2.08	1								1.84E-11	2.0E-03	5.10	18.0	108.0
KLX 18A	444.00	449.00	1.00E-06	1.00E-06		6.44	1								9.91E-12	1.1E-03	0.22	7.2	2520.0
KLX 18A	449.00	454.00	1.00E-06	1.00E-06		11.20	0								1.48E-11	1.6E-03	-1.39	36.0	540.0
KLX 18A	454.00	459.00	1.00E-06	1.00E-06		11.86	-1								9.84E-11	1.1E-02	-0.03	21.6	108.0
KLX 18A	459.00	464.00	1.00E-06	1.00E-06		10.68	-1								1.51E-11	1.7E-03	-0.25	32.4	540.0
KLX 18A	464.00	469.00	1.00E-06	1.00E-06		12.99	-1								9.11E-12	1.0E-03	1.16	108.0	540.0
KLX 18A	469.00	474.00	1.00E-06	1.00E-06		39.41	0								1.42E-11	1.6E-03	21.70	72.0	540.0
KLX 18A	474.00	479.00	1.00E-06	1.00E-06		43.87	0								2.77E-11	3.1E-03	3.10	28.8	1080.0
KLX 18A	477.00	482.00	1.00E-06	1.00E-06		33.02	0								1.83E-11	2.0E-03	15.80	108.0	540.0
KLX 18A	482.00	487.00	1.00E-06	1.00E-06		16.00	0								7.70E-10	8.5E-02	-0.90	252.0	1080.0
KLX 18A	487.00	492.00	1.00E-06	1.00E-06		10.76	1								1.26E-11	1.4E-03	3.67	23.4	108.0
KLX 18A	489.00	494.00	1.00E-06	1.00E-06		10.74	-1								4.51E-11	5.0E-03	-0.79	28.8	144.0
KLX 18A	494.00	499.00	1.00E-06	1.00E-06		18.99	-1								4.17E-11	4.6E-03	0.40	144.0	540.0
KLX 18A	499.00	504.00	1.00E-06	1.00E-06		5.87	0								1.79E-12	2.0E-04	1.81	10.8	612.0
KLX 18A	504.00	509.00	1.00E-06	1.00E-06		9.63	1								1.79E-10	2.0E-02	-0.10	36.0	144.0
KLX 18A	509.00	514.00	1.00E-06	1.00E-06		12.43	0								2.05E-11	2.3E-03	2.06	14.4	540.0
KLX 18A	514.00	519.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 18A	519.00	524.00	1.00E-06	1.00E-06		10.64	1								1.66E-11	1.8E-03	5.50	54.0	180.0
KLX 18A	524.00	529.00	1.00E-06	1.00E-06		12.62	0								1.63E-11	1.8E-03	3.23	9.0	540.0
KLX 18A	529.00	534.00	1.00E-06	1.00E-06		13.22	0								1.94E-11	2.1E-03	3.43	7.2	1080.0
KLX 18A	534.00	539.00	1.00E-06	1.00E-06		8.30	-1								1.52E-11	1.7E-03	2.06	36.0	144.0
KLX 18A	539.00	544.00	1.00E-06	1.00E-06		87.45	0								6.03E-11	6.6E-03	20.90	10.8	540.0
KLX 18A	544.00	549.00	1.00E-06	1.00E-06		10.51	-1								4.01E-11	4.4E-03	5.02	18.0	72.0
KLX 18A	549.00	554.00	1.00E-06	1.00E-06		9.01	-1								9.44E-11	1.0E-02	-2.92	360.0	540.0
KLX 18A	554.00	559.00	1.00E-06	1.00E-06		5.46	-1								4.33E-12	4.8E-04	2.70	54.0	216.0
KLX 18A	559.00	564.00	1.00E-06	1.00E-06		22.37	-1								2.67E-10	2.9E-02	-1.68	14.4	144.0
KLX 18A	564.00	569.00	1.00E-06	1.00E-06		48.62	0								5.29E-11	5.8E-03	5.05	28.8	1080.0
KLX 18A	569.00	574.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 18A	574.00	579.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 18A	579.00	584.00	1.00E-06	1.00E-06		2.84	0								1.80E-12	2.0E-04	2.56	252.0	1080.0
KLX 18A	584.00	589.00	1.00E-06	1.00E-06		#NV	#NV								#NV	#NV	#NV	#NV	#NV
KLX 18A	589.00	594.00	1.00E-06	1.00E-06		16.57	-1								3.28E-10	3.6E-02	1.67	9.0	43.2
KLX 18A	594.00	599.00	1.00E-06	1.00E-06		56.09	0								3.32E-11	3.7E-03	5.67	43.2	900.0

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 18A	389.00	394.00					3817.3													
KLX 18A	394.00	399.00					3865.8													
KLX 18A	399.00	404.00					3908.0													
KLX 18A	404.00	409.00					3957.7													
KLX 18A	409.00	414.00					4006.8													
KLX 18A	414.00	419.00					4055.8													
KLX 18A	419.00	424.00					4105.4													
KLX 18A	424.00	429.00					4153.3													
KLX 18A	429.00	434.00					4200.4													
KLX 18A	434.00	439.00					4250.3													
KLX 18A	439.00	444.00					#NV													
KLX 18A	444.00	449.00					#NV													
KLX 18A	449.00	454.00					4393.1													
KLX 18A	454.00	459.00					4445.1													
KLX 18A	459.00	464.00					4492.0													
KLX 18A	464.00	469.00					4538.1													
KLX 18A	469.00	474.00					4599.8													
KLX 18A	474.00	479.00					4647.4													
KLX 18A	477.00	482.00					4676.0													
KLX 18A	482.00	487.00					4711.5													
KLX 18A	487.00	492.00					4772.5													
KLX 18A	489.00	494.00					4790.3													
KLX 18A	494.00	499.00					4857.9													
KLX 18A	499.00	504.00					#NV													
KLX 18A	504.00	509.00					4959.5													
KLX 18A	509.00	514.00					#NV													
KLX 18A	514.00	519.00					#NV													
KLX 18A	519.00	524.00					5102.5													
KLX 18A	524.00	529.00					#NV													
KLX 18A	529.00	534.00					#NV													
KLX 18A	534.00	539.00					5227.9													
KLX 18A	539.00	544.00					5278.3													
KLX 18A	544.00	549.00					5329.3													
KLX 18A	549.00	554.00					5365.8													
KLX 18A	554.00	559.00					5421.4													
KLX 18A	559.00	564.00					5474.5													
KLX 18A	564.00	569.00					5529.0													
KLX 18A	569.00	574.00					#NV													
KLX 18A	574.00	579.00					#NV													
KLX 18A	579.00	584.00					#NV													
KLX 18A	584.00	589.00					#NV													
KLX 18A	589.00	594.00					5766.7													
KLX 18A	594.00	599.00					5817.6													

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 18A	060815 10:44:00	060815 12:10:00	104.00	204.00		205.00	611.28	1007	1010	1011	2002	2002	2002	
KLX 18A	060815 14:05:00	060815 16:10:00	204.00	304.00		305.00	611.28	1982	1982	1982	2972	2972	2972	
KLX 18A	060815 17:25:00	060815 19:19:00	304.00	404.00		405.00	611.28	2958	2956	2959	3938	3938	3938	
KLX 18A	060815 21:08:00	060815 23:01:00	404.00	504.00		505.00	611.28	3921	3921	3920	4915	4915	4915	
KLX 18A	060816 07:34:00	060816 09:40:00	504.00	604.00		605.00	611.28	4886	4886	4886	5910	5923	5901	
KLX 18A	060816 19:58:00	060816 21:22:00	104.00	124.00		125.00	611.28	1017	1018	1019	1229	1245	1230	
KLX 18A	060816 22:02:00	060816 23:27:00	124.00	144.00		145.00	611.28	1211	1219	1215	1422	1422	1422	
KLX 18A	060816 23:59:00	060817 01:27:00	144.00	164.00		165.00	611.28	1404	1405	1405	1614	1613	1614	
KLX 18A	060817 06:38:00	060817 08:23:00	164.00	184.00		185.00	611.28	1594	1595	1595	1806	1806	1806	
KLX 18A	060817 09:06:00	060817 10:48:00	184.00	204.00		205.00	611.28	1790	1790	1791	2001	2001	2001	
KLX 18A	060817 11:27:00	060817 13:32:00	204.00	224.00		225.00	611.28	1984	1985	1985	2196	2195	2196	
KLX 18A	060817 14:08:00	060817 16:08:00	224.00	244.00		245.00	611.28	2179	2179	2180	2390	2390	2390	
KLX 18A	060817 16:43:00	060817 18:16:00	244.00	264.00		265.00	611.28	2373	2373	2373	2584	2584	2584	
KLX 18A	060817 18:46:00	060817 20:28:00	264.00	284.00		285.00	611.28	2567	2567	2567	2778	2778	2777	
KLX 18A	060817 21:22:00	060817 23:01:00	284.00	304.00		305.00	611.28	2806	2806	2806	2971	2971	2970	
KLX 18A	060817 23:30:00	060818 00:54:00	304.00	324.00		325.00	611.28	2952	2952	2952	3164	3164	3164	
KLX 18A	060818 01:24:00	060818 02:47:00	324.00	344.00		345.00	611.28	3144	3145	3145	3357	3357	3356	
KLX 18A	060818 06:29:00	060818 08:03:00	344.00	364.00		365.00	611.28	3336	3337	3337	3548	3548	3548	
KLX 18A	060818 08:34:00	060818 10:01:00	364.00	384.00		385.00	611.28	3530	3531	3531	3742	3743	3742	
KLX 18A	060818 10:38:00	060818 12:07:00	384.00	404.00		405.00	611.28	3725	3725	3726	3938	3939	3938	
KLX 18A	060818 13:16:00	060818 14:45:00	404.00	424.00		425.00	611.28	3920	3920	3920	4133	4134	4134	
KLX 18A	060818 15:16:00	060818 16:46:00	424.00	444.00		445.00	611.28	4113	4114	4114	4335	4335	4335	
KLX 18A	060818 17:20:00	060818 18:44:00	444.00	464.00		465.00	611.28	4305	4305	4305	4529	4530	4530	
KLX 18A	060818 19:19:00	060818 20:35:00	464.00	484.00		485.00	611.28	4498	4498	4498	4723	4723	4723	
KLX 18A	060819 00:45:00	060819 04:09:00	484.00	504.00		505.00	611.28	4689	4689	4688	4915	4915	4914	
KLX 18A	060819 06:24:00	060819 08:12:00	504.00	524.00		525.00	611.28	4881	4881	4881	5107	5108	5108	
KLX 18A	060819 08:45:00	060819 10:16:00	524.00	544.00		545.00	611.28	5076	5076	5076	5302	5302	5303	
KLX 18A	060819 10:56:00	060819 12:36:00	544.00	564.00		565.00	611.28	5272	5273	5273	5498	5499	5499	
KLX 18A	060819 13:29:00	060819 14:56:00	564.00	584.00		585.00	611.28	5468	5468	5468	5694	5694	5694	
KLX 18A	060819 15:30:00	060819 16:51:00	584.00	604.00		605.00	611.28	5663	5663	5663	5904	5914	5901	
KLX 18A	060820 08:53:00	060820 10:28:00	299.00	304.00		305.00	611.28	2903	2903	2904	2970	2970	2970	
KLX 18A	060820 10:58:00	060820 12:56:00	304.00	309.00		310.00	611.28	2952	2952	2953	3018	3018	3018	
KLX 18A	060820 13:33:00	060820 15:04:00	309.00	314.00		315.00	611.28	3001	3002	3002	3068	3068	3068	
KLX 18A	060820 15:29:00	060820 16:27:00	314.00	319.00		320.00	611.28	3050	3050	3050	3117	3117	3117	
KLX 18A	060820 16:52:00	060820 18:12:00	319.00	324.00		325.00	611.28	3099	3100	3100	3166	3165	3165	
KLX 18A	060820 18:35:00	060820 19:31:00	324.00	329.00		330.00	611.28	3147	3148	3148	3214	3214	3214	
KLX 18A	060820 19:53:00	060820 21:14:00	329.00	334.00		335.00	611.28	3195	3196	3196	3262	3261	3261	
KLX 18A	060820 21:58:00	060820 23:46:00	334.00	339.00		340.00	611.28	3243	3244	3244	3309	3309	3309	
KLX 18A	060821 00:08:00	060821 01:31:00	339.00	344.00		345.00	611.28	3291	3291	3291	3357	3357	3357	
KLX 18A	060821 01:55:00	060821 03:24:00	344.00	349.00		350.00	611.28	3339	3339	3339	3405	3405	3405	
KLX 18A	060821 06:23:00	060821 08:08:00	349.00	354.00		355.00	611.28	3386	3386	3386	3453	3453	3453	
KLX 18A	060821 08:44:00	060821 10:08:00	354.00	359.00		360.00	611.28	3434	3434	3434	3501	3501	3501	
KLX 18A	060821 10:37:00	060821 12:02:00	359.00	364.00		365.00	611.28	3483	3484	3484	3549	3549	3550	
KLX 18A	060821 13:02:00	060821 14:22:00	364.00	369.00		370.00	611.28	3532	3533	3533	3600	3601	3599	
KLX 18A	060821 15:02:00	060821 16:20:00	369.00	374.00		375.00	611.28	3581	3581	3582	3648	3648	3648	
KLX 18A	060821 16:42:00	060821 18:05:00	374.00	379.00		380.00	611.28	3620	3629	3629	3696	3696	3696	
KLX 18A	060821 18:28:00	060821 19:48:00	379.00	384.00		385.00	611.28	3677	3677	3677	3744	3744	3744	
KLX 18A	060821 20:20:00	060821 21:41:00	384.00	389.00		390.00	611.28	3726	3726	3726	3792	3792	3792	

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 18A	060821 22:03:00	060821 23:33:00	389.00	394.00		395.00	611.28	3773	3773	3773	3840	3839	3839	
KLX 18A	060821 23:59:00	060822 01:29:00	394.00	399.00		400.00	611.28	3821	3821	3821	3887	3887	3887	
KLX 18A	060822 06:19:00	060822 07:37:00	399.00	404.00		405.00	611.28	3868	3869	3869	3936	3936	3936	
KLX 18A	060822 08:10:00	060822 09:32:00	404.00	409.00		410.00	611.28	3918	3918	3918	3985	3985	3985	
KLX 18A	060822 10:09:00	060822 11:36:00	409.00	414.00		415.00	611.28	3966	3966	3967	4033	4033	4033	
KLX 18A	060822 14:07:00	060822 15:25:00	414.00	419.00		420.00	611.28	4016	4016	4016	4083	4084	4082	
KLX 18A	060822 15:59:00	060822 17:19:00	419.00	424.00		425.00	611.28	4064	4066	4065	4133	4138	4133	
KLX 18A	060822 17:42:00	060822 19:08:00	424.00	429.00		430.00	611.28	4113	4113	4113	4183	4185	4184	
KLX 18A	060822 19:32:00	060822 20:54:00	429.00	434.00		435.00	611.28	4159	4160	4159	4236	4236	4236	
KLX 18A	060822 21:24:00	060822 22:46:00	434.00	439.00		440.00	611.28	4206	4206	4206	4284	4284	4284	
KLX 18A	060822 23:10:00	060823 00:35:00	439.00	444.00		445.00	611.28	4253	4253	4253	4332	4332	4332	
KLX 18A	060823 01:02:00	060823 03:40:00	444.00	449.00		450.00	611.28	4301	4301	4301	4380	4380	4379	
KLX 18A	060823 06:23:00	060823 08:04:00	449.00	454.00		455.00	611.28	4349	4349	4349	4428	4428	4429	
KLX 18A	060823 08:37:00	060823 10:04:00	454.00	459.00		460.00	611.28	4398	4398	4399	4478	4478	4478	
KLX 18A	060823 10:41:00	060823 12:04:00	459.00	464.00		465.00	611.28	4448	4448	4448	4527	4527	4527	
KLX 18A	060823 13:31:00	060823 15:05:00	464.00	469.00		470.00	611.28	4497	4497	4497	4576	4576	4576	
KLX 18A	060823 16:36:00	060823 17:54:00	469.00	474.00		475.00	611.28	4546	4546	4546	4625	4625	4625	
KLX 18A	060823 18:19:00	060823 19:37:00	474.00	479.00		480.00	611.28	4594	4594	4594	4674	4674	4674	
KLX 18A	060823 20:08:00	060823 21:32:00	477.00	482.00		483.00	611.28	4623	4623	4623	4703	4702	4702	
KLX 18A	060823 21:55:00	060823 23:32:00	482.00	487.00		488.00	611.28	4670	4670	4670	4751	4751	4750	
KLX 18A	060823 23:55:00	060824 01:21:00	487.00	492.00		493.00	611.28	4718	4718	4717	4798	4798	4798	
KLX 18A	060824 06:23:00	060824 07:59:00	489.00	494.00		495.00	611.28	4736	4736	4736	4816	4816	4816	
KLX 18A	060824 08:48:00	060824 10:28:00	494.00	499.00		500.00	611.28	4787	4787	4787	4867	4867	4867	
KLX 18A	060824 11:04:00	060824 12:08:00	499.00	504.00		505.00	611.28	4837	4837	4837	4916	4916	4916	
KLX 18A	060824 14:09:00	060824 16:21:00	504.00	509.00		510.00	611.28	4887	4887	4887	4966	4966	4966	
KLX 18A	060824 16:44:00	060824 17:40:00	509.00	514.00		515.00	611.28	4936	4936	4936	5015	5015	5015	
KLX 18A	060824 18:02:00	060824 18:57:00	514.00	519.00		520.00	611.28	4984	4984	4984	5064	5064	5064	
KLX 18A	060824 19:21:00	060824 20:43:00	519.00	524.00		525.00	611.28	5032	5032	5032	5112	5112	5112	
KLX 18A	060824 21:09:00	060824 22:14:00	524.00	529.00		530.00	611.28	5079	5079	5079	5160	5160	5160	
KLX 18A	060824 22:37:00	060824 23:43:00	529.00	534.00		535.00	611.28	5127	5127	5127	5207	5207	5206	
KLX 18A	060825 00:07:00	060825 01:32:00	534.00	539.00		540.00	611.28	5174	5174	5174	5254	5254	5254	
KLX 18A	060825 06:09:00	060825 07:44:00	539.00	544.00		545.00	611.28	5223	5223	5223	5303	5303	5303	
KLX 18A	060825 08:29:00	060825 09:59:00	544.00	549.00		550.00	611.28	5272	5272	5273	5352	5352	5352	
KLX 18A	060825 10:32:00	060825 12:27:00	549.00	554.00		555.00	611.28	5323	5323	5323	5402	5403	5403	
KLX 18A	060825 13:24:00	060825 15:03:00	554.00	559.00		560.00	611.28	5372	5372	5373	5452	5452	5452	
KLX 18A	060825 15:36:00	060825 16:54:00	559.00	564.00		565.00	611.28	5422	5422	5422	5501	5502	5502	
KLX 18A	060825 17:19:00	060825 18:40:00	564.00	569.00		570.00	611.28	5470	5470	5470	5550	5550	5550	
KLX 18A	060825 19:04:00	060825 21:13:00	569.00	574.00		575.00	611.28	5519	5519	5519	5598	5598	5598	
KLX 18A	060825 21:36:00	060825 22:15:00	574.00	579.00		580.00	611.28	5567	5566	5566	5646	5646	5646	
KLX 18A	060825 22:38:00	060825 23:58:00	579.00	584.00		585.00	611.28	5612	5612	5612	5692	5692	5692	
KLX 18A	060826 00:20:00	060826 01:08:00	584.00	589.00		590.00	611.28	5660	5660	5659	5740	5740	5740	
KLX 18A	060826 06:16:00	060826 07:46:00	589.00	594.00		595.00	611.28	5709	5709	5709	5789	5819	5790	
KLX 18A	060826 08:29:00	060826 09:53:00	594.00	599.00		600.00	611.28	5759	5759	5759	5844	5843	5841	