

ACOUSTIC PRESSURE BUILDUP TEST REPORT
Golden Company Ltd.
100/00-00-000-00 WOM/00
Red Deer
October 30 - November 10, xxxx

Prepared for
GOLDEN COMPANY LTD.

Prepared by
NELGAR OILFIELD SERVICES

Analyzed by;
JOHN SLIVA

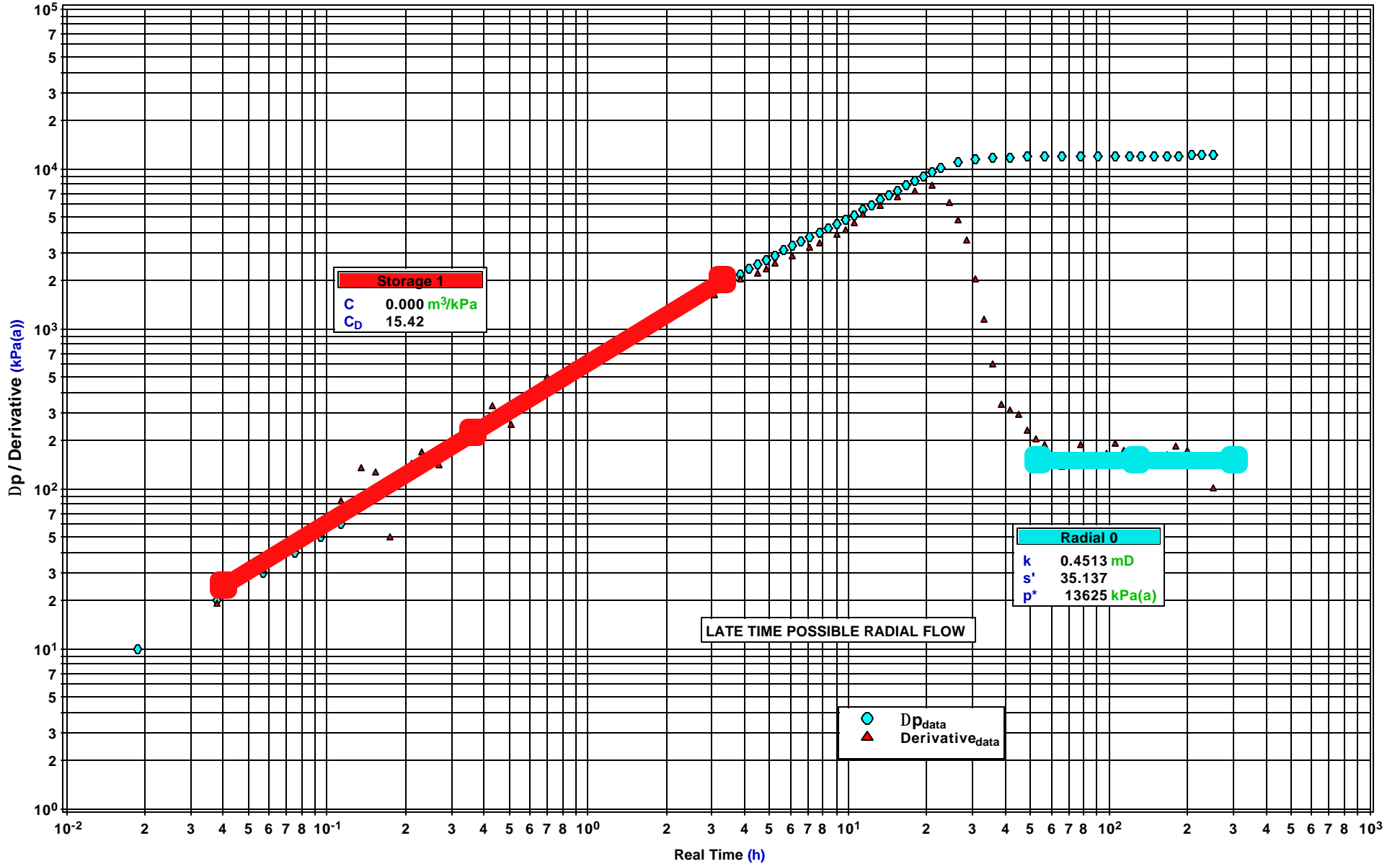
NOVEMBER 27, xxxx



PENN WEST PEM
 15-32-47-7W5M
 CARDIUM
 OCTOBER 30-NOVEMBER 10, 2009

Diagnostic Analysis 1

Typecurve

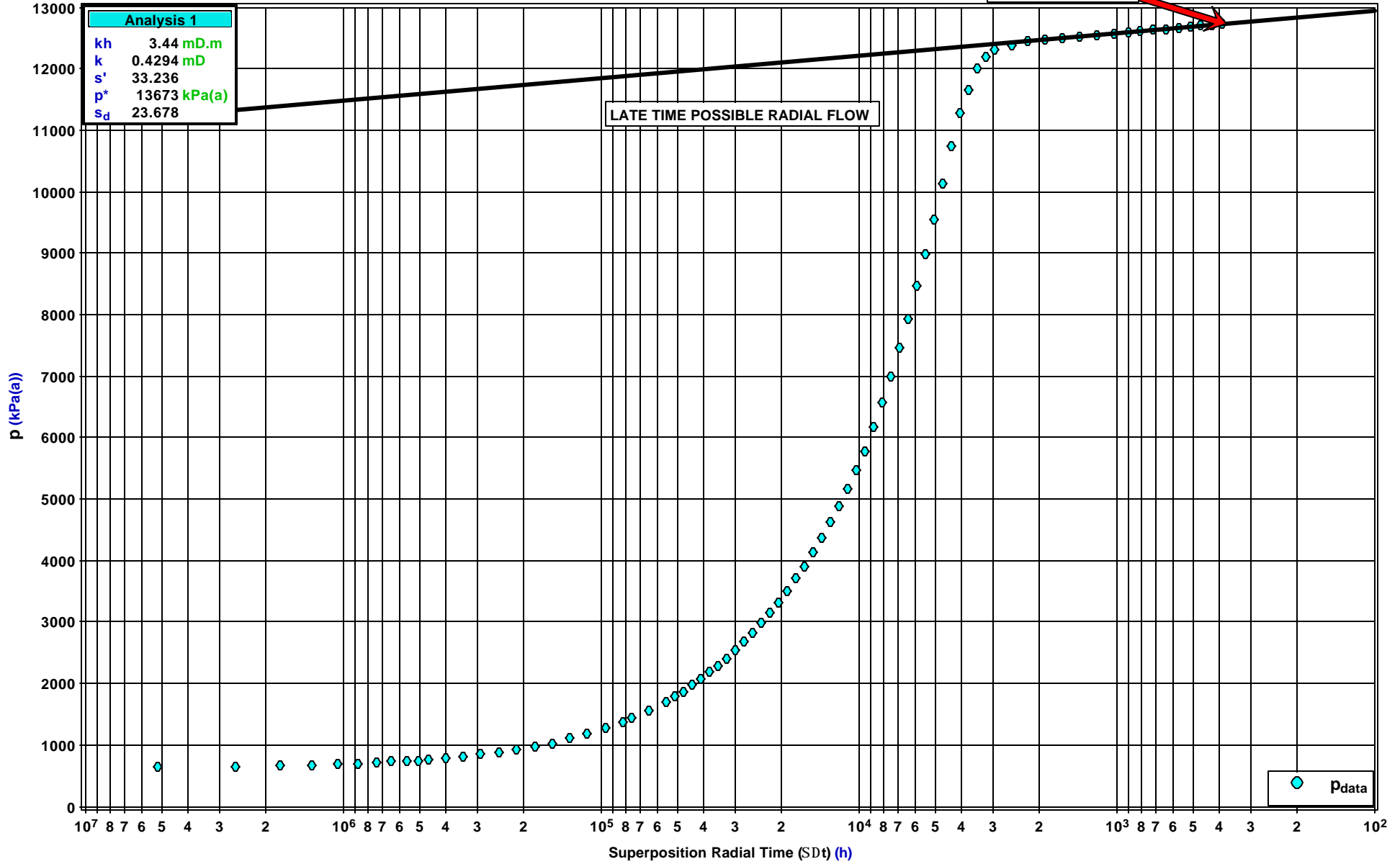


PENN WEST PEM
 15-32-47-7W5M
 CARDIUM
 OCTOBER 30-NOVEMBER 10, 2009

Diagnostic Analysis 1

Radial

Dt 265.53 h
 p 12728 kPa(a)
 r_{inv} 16.082 m



Oil Well Test - Buildup

Radial Flow Analysis

PENN WEST PEM
15-32-47-7W5M

CARDIUM
OCTOBER 30-NOVEMBER 10, 2009

Analysis Results

Total Sandface Rate (q_{tBt})	0.620 m ³ /d	Apparent Skin (s')	33.236
Semilog Slope (m)	365.38	Skin - Damage	23.678
Gas Permeability (k_g)	mD	Skin - Inclination	-0.000
Oil Permeability (k_o)	0.429 mD	Skin - Partial Penetration	1.665
Water Permeability (k_w)	mD	Pressure Drop Due to Skin (Δp_s)	10552.74 kPa
Flow Capacity (kh)	3.436 mD.m	Damage Ratio (DR)	7.851
Total Mobility (k/μ_t)	0.45 mD/mPa.s	Flow Efficiency (FE)	0.127
Total Transmissivity (kh/μ_t)	3.60 mDm/mPa.s		

Reservoir Parameters

Net Pay (h)	8.00 m
Total Porosity (Φ_t)	18.20 %
Water Saturation (S_w)	15.00 %
Oil Saturation (S_o)	85.00 %
Gas Saturation (S_g)	0.00 %
Wellbore Radius (r_w)	0.091 m
Formation Temperature (T)	56.0 °C
Formation Compressibility (c_f)	5.500e-7 kPa ⁻¹
Total Compressibility (c_t)	3.660e-5 kPa ⁻¹

Pressures

Initial Pressure (p_i)	12728.44 kPa
Extrapolated Pressure (p^*)	13673.42 kPa
Final Flowing Pressure (p_{wfO})	635.44 kPa

Production and Times

Corrected Flow Time (t_c)	99000.0000 hr
Cumulative Oil Production	2062.500 m ³
Final Oil Rate	0.500 m ³ /d

Fluid Properties

Oil Compressibility (c_o)	4.23328e-5 kPa ⁻¹
Oil Formation Volume Factor (B_o)	1.240
Oil Viscosity (μ_o)	0.955 mPa.s
Solution Gas Ratio (R_s)	74 m ³ /m ³
Oil Gravity (γ_o)	0.840
Gas Gravity (G)	0.700
PVT Reference Pressure (pp_{VT})	12728.44 kPa

Production Data

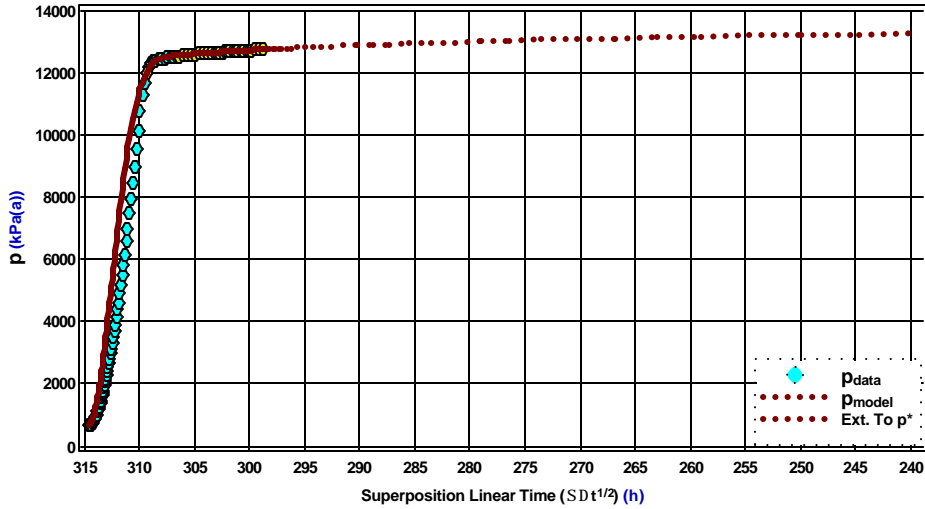
ItDate Clocl	TimCumulativ	Calculated Gas	Oil	Water	Cond.	Total	Fluid	Fluid	Calculated Oil	Water	Average				
TimePressu	Sandface	Rate	Rate	Rate	Rate	Gas R:	Level (L	Level (TVD	Gradier	GraLiqui	Gradient				
YYYY/MM/DD HH:mn:ss	h	kPa(a)	kPa(a)	10 ³ m ³ /d	m ³ /d	m ³ /d	m ³ /d	10 ³ m ³ /d	m	m	kPa/m	kPa/m	kPa/m	kPa/m	
1	07/15 11	0.0000	0.0000		0.000	0.0	0.0	0.0	0.000						
2	10/30 11	9000.000	9000.000	514.96	635.44	0.000	0.5	0.0	0.0	0.000	1463.120	1463.020	0.0440	7.8770	9.8070
3	10/30 11	9000.010	9000.010	515.75	645.39	0.000	0.0	0.0	0.0	0.000	1461.960	1461.860	0.0440	7.8750	9.8070
4	10/30 11	9000.030	9000.030	516.66	655.54						1460.800	1460.700	0.0450	7.8750	9.8070
5	10/30 11	9000.050	9000.050	517.22	665.23						1459.640	1459.540	0.0450	7.8750	9.8070
6	10/30 11	9000.070	9000.070	518.06	675.24						1458.480	1458.380	0.0450	7.8740	9.8070
7	10/30 11	9000.090	9000.090	519.17	685.48						1457.340	1457.240	0.0450	7.8740	9.8070
8	10/30 11	9000.110	9000.110	519.91	695.37						1456.180	1456.080	0.0450	7.8740	9.8070
9	10/30 11	9000.130	9000.130	520.71	714.37						1453.870	1453.770	0.0450	7.8740	9.8070
10	10/30 11	9000.150	9000.150	521.60	733.49						1451.550	1451.450	0.0450	7.8740	9.8070
11	10/30 11	9000.170	9000.170	522.70	746.80						1450.010	1450.000	0.0450	7.8740	9.8070
12	10/30 11	9000.190	9000.190	523.35	747.54						1450.010	1450.000	0.0450	7.8740	9.8070
13	10/30 11	9000.210	9000.210	523.90	766.26						1447.700	1447.600	0.0450	7.8740	9.8070
14	10/30 11	9000.230	9000.230	524.72	773.22						1446.930	1446.830	0.0450	7.8730	9.8070
15	10/30 11	9000.240	9000.240	525.90	792.65						1444.620	1444.520	0.0450	7.8730	9.8070
16	10/30 11	9000.260	9000.260	526.53	799.40						1443.850	1443.750	0.0450	7.8730	9.8070
17	10/30 11	9000.280	9000.280	527.25	812.28						1442.300	1442.200	0.0450	7.8730	9.8070
18	10/30 12	9000.310	9000.310	528.11	825.32						1440.760	1440.660	0.0460	7.8730	9.8070
19	10/30 12	9000.330	9000.330	529.27	844.73						1438.450	1438.350	0.0460	7.8730	9.8070
20	10/30 12	9000.360	9000.360	530.28	857.94						1436.910	1436.810	0.0460	7.8730	9.8070
21	10/30 12	9000.390	9000.390	531.48	877.39						1434.590	1434.490	0.0460	7.8720	9.8070
22	10/30 12	9000.430	9000.430	532.66	896.82						1432.280	1432.180	0.0460	7.8720	9.8070
23	10/30 12	9000.460	9000.460	534.46	929.01						1428.430	1428.330	0.0460	7.8720	9.8070
24	10/30 12	9000.500	9000.500	535.93	948.76						1426.120	1426.020	0.0460	7.8720	9.8070
25	10/30 12	9000.540	9000.540	537.54	968.67						1423.800	1423.700	0.0460	7.8710	9.8070
26	10/30 12	9000.590	9000.590	539.22	1000.69						1419.950	1419.850	0.0470	7.8710	9.8070
27	10/30 12	9000.640	9000.640	541.12	1026.93						1416.870	1416.770	0.0470	7.8710	9.8070
28	10/30 12	9000.690	9000.690	543.02	1059.19						1413.020	1413.010	0.0470	7.8700	9.8070
29	10/30 12	9000.750	9000.750	544.83	1103.40						1407.630	1407.530	0.0470	7.8700	9.8070
30	10/30 12	9000.810	9000.810	547.09	1136.06						1403.770	1403.670	0.0470	7.8690	9.8070
31	10/30 12	9000.880	9000.880	549.62	1187.09						1397.610	1397.510	0.0480	7.8690	9.8070
32	10/30 12	9000.950	9000.950	552.24	1226.16						1392.990	1392.890	0.0480	7.8680	9.8070
33	10/30 12	9001.030	9001.030	555.12	1277.55						1386.830	1386.730	0.0480	7.8680	9.8070
34	10/30 12	9001.110	9001.110	558.14	1323.08						1381.440	1381.340	0.0480	7.8670	9.8070
35	10/30 12	9001.200	9001.200	561.66	1369.15						1376.040	1376.030	0.0490	7.8670	9.8070
36	10/30 12	9001.300	9001.300	564.99	1439.08						1367.570	1367.470	0.0490	7.8660	9.8070
37	10/30 13	9001.400	9001.400	568.72	1485.36						1362.180	1362.080	0.0490	7.8380	9.8070
38	10/30 13	9001.520	9001.520	572.76	1568.07						1352.160	1352.060	0.0500	7.8340	9.8070
39	10/30 13	9001.640	9001.640	577.37	1633.24						1344.470	1344.370	0.0500	7.8310	9.8070
40	10/30 13	9001.770	9001.770	581.84	1708.86						1335.420	1335.320	0.0500	7.8280	9.8070
41	10/30 13	9001.920	9001.920	587.03	1785.23						1326.370	1326.270	0.0510	7.8240	9.8070
42	10/30 13	9002.070	9002.070	592.98	1862.42						1317.320	1317.220	0.0510	7.8200	9.8070
43	10/30 13	9002.240	9002.240	598.97	1969.02						1304.500	1304.400	0.0520	7.8150	9.8070
44	10/30 14	9002.420	9002.420	605.65	2064.57						1293.190	1293.090	0.0530	7.8110	9.8070
45	10/30 14	9002.620	9002.620	612.98	2178.42						1279.610	1279.510	0.0530	7.8050	9.8070
46	10/30 14	9002.830	9002.830	621.21	2293.18						1266.040	1266.030	0.0540	7.7990	9.8070
47	10/30 14	9003.050	9003.050	630.04	2402.67						1253.220	1253.120	0.0550	7.7940	9.8070
48	10/30 14	9003.300	9003.300	639.40	2536.13						1237.380	1237.280	0.0560	7.7870	9.8070
49	10/30 15	9003.560	9003.560	649.86	2670.69						1221.540	1221.440	0.0570	7.7800	9.8070
50	10/30 15	9003.850	9003.850	661.45	2823.95						1203.440	1203.340	0.0580	7.7730	9.8070
51	10/30 15	9004.160	9004.160	673.86	2980.19						1185.060	1185.050	0.0590	7.7650	9.8070
52	10/30 16	9004.490	9004.490	687.31	3144.88						1165.710	1165.610	0.0600	7.7560	9.8070
53	10/30 16	9004.850	9004.850	701.94	3316.24						1145.640	1145.540	0.0610	7.7470	9.8070
54	10/30 16	9005.240	9005.240	718.38	3506.01						1123.420	1123.320	0.0630	7.7370	9.8070
55	10/30 17	9005.660	9005.660	736.42	3702.79						1100.490	1100.390	0.0640	7.7270	9.8070
56	10/30 17	9006.120	9006.120	756.20	3910.35						1076.370	1076.270	0.0660	7.7160	9.8070
57	10/30 18	9006.610	9006.610	777.70	4134.68						1050.270	1050.170	0.0680	7.7040	9.8070
58	10/30 18	9007.140	9007.140	802.28	4367.23						1023.490	1023.390	0.0700	7.6910	9.8070
59	10/30 19	9007.710	9007.710	829.16	4622.92						993.960	993.860	0.0730	7.6770	9.8070
60	10/30 20	9008.330	9008.330	859.33	4886.88						963.740	963.640	0.0760	7.6630	9.8070
61	10/30 20	9008.990	9008.990	893.43	5159.69						932.830	932.730	0.0790	7.6480	9.8070
62	10/30 21	9009.710	9009.710	931.30	5467.34						897.810	897.710	0.0820	7.6310	9.8070
63	10/30 22	9010.490	9010.490	975.48	5781.81						862.650	862.550	0.0860	7.6130	9.8070
64	10/30 23	9011.320	9011.320	1024.86	6164.64						819.100	819.000	0.0910	7.5920	9.8070
65	10/30 23	9012.220	9012.220	1082.44	6560.43						774.780	774.680	0.0960	7.5690	9.8070
66	10/31 00	9013.210	9013.210	1150.10	6993.97						726.550	726.550	0.1030	7.5450	9.8070
67	10/31 01	9014.260	9014.260	1229.38	7454.76						676.220	676.120	0.1100	7.5190	9.8070
68	10/31 03	9015.400	9015.400	1324.10	7940.38						624.270	624.170	0.1190	7.4910	9.8070
69	10/31 04	9016.640	9016.640	1437.67	8459.39						570.020	570.010	0.1300	7.4620	9.8070
70	10/31 05	9017.970	9017.970	1572.20	8984.76						517.310	517.210	0.1430	7.4310	9.8070
71	10/31 07	9019.400	9019.400	1741.28	9546.30						463.820	463.720	0.1600	7.3990	9.8070
72	10/31 08	9020.950	9020.950	1944.34	10125.90						411.870	411.770	0.1800	7.3330	9.8070
73	10/31 10	9022.630	9022.630	2184.90	10732.80						360.490	360.390	0.2050	7.2970	9.8070
74	10/31 12	9024.440	9024.440	2437.39	11274.20						319.090	319.080	0.2310	7.2650	9.8070

Production Data

ItDate Clocl	TimCumulati	Calculated Gas	Oil	Water	Cond.	Total	Fluid	Fluid	Calculated Oil	Water	Average			
TimePressu	Sandface	Rate	Rate	Rate	Rate	Gas R:	Level (L	Level (TVD	Gradier	GraLiqui	Gradient			
YYYY/MM/DD HH:mn:ss	h	kPa(a)	kPa(a)	10 ³ m ³ /d	m ³ /d	m ³ /d	m ³ /d	10 ³ m ³ /d	m	m	kPa/m	kPa/m	kPa/m	kPa/m
75	10/31 14	9026.39	9026.39	2673.74	11657.12				297.130	297.030	0.2560	7.2420	9.8070	
76	10/31 16	9028.49	9028.49	2850.01	11993.7				273.420	273.320	0.2750	7.2220	9.8070	
77	10/31 18	9030.77	9030.77	2955.84	12193.11				259.470	259.370	0.2870	7.2100	9.8070	
78	10/31 20	9033.22	9033.22	3010.66	12300.0				251.700	251.600	0.2930	7.2040	9.8070	
79	10/31 23	9035.87	9035.87	3043.43	12364.12				247.020	247.010	0.2960	7.2000	9.8070	
80	11/01 02	9038.73	9038.73	3063.32	12390.9				245.880	245.780	0.2990	7.1980	9.8070	
81	11/01 05	9041.83	9041.83	3078.91	12414.4				244.640	244.540	0.3000	7.1970	9.8070	
82	11/01 08	9045.17	9045.17	3091.98	12437.8				243.070	243.060	0.3020	7.1960	9.8070	
83	11/01 12	9048.76	9048.76	3100.27	12457.7				241.360	241.260	0.3030	7.1950	9.8070	
84	11/01 16	9052.65	9052.65	3110.19	12472.7				240.560	240.460	0.3040	7.1940	9.8070	
85	11/01 20	9056.85	9056.85	3121.29	12488.7				239.780	239.680	0.3050	7.1930	9.8070	
86	11/02 01	9061.41	9061.41	3128.91	12501.2				239.030	239.020	0.3060	7.1920	9.8070	
87	11/02 06	9066.30	9066.30	3136.35	12512.9				238.360	238.260	0.3070	7.1910	9.8070	
88	11/02 11	9071.59	9071.59	3142.17	12522.0				237.850	237.750	0.3070	7.1910	9.8070	
89	11/02 17	9077.33	9077.33	3150.35	12536.4				236.900	236.800	0.3080	7.1900	9.8070	
90	11/02 23	9083.49	9083.49	3157.91	12550.6				235.900	235.800	0.3090	7.1890	9.8070	
91	11/03 05	9090.15	9090.15	3165.24	12563.5				235.050	235.040	0.3100	7.1880	9.8070	
92	11/03 13	9097.31	9097.31	3169.26	12573.8				234.110	234.010	0.3100	7.1880	9.8070	
93	11/03 20	9105.12	9105.12	3177.55	12588.5				233.140	233.040	0.3110	7.1870	9.8070	
94	11/04 02	9111.13	9111.13	3183.37	12598.8				232.470	232.370	0.3120	7.1860	9.8070	
95	11/04 05	9113.49	9113.49	3185.66	12602.7				232.220	232.120	0.3120	7.1860	9.8070	
96	11/04 11	9119.67	9119.67	3189.90	12611.1				231.590	231.490	0.3130	7.1850	9.8070	
97	11/04 14	9122.54	9122.54	3190.99	12614.0				231.310	231.210	0.3130	7.1850	9.8070	
98	11/04 20	9128.55	9128.55	3193.98	12620.8				230.760	230.660	0.3130	7.1850	9.8070	
99	11/05 00	9132.37	9132.37	3195.87	12624.4				230.500	230.400	0.3130	7.1850	9.8070	
100	11/05 06	9138.38	9138.38	3198.94	12631.2				229.940	229.840	0.3140	7.1840	9.8070	
101	11/05 10	9142.92	9142.92	3201.45	12635.4				229.690	229.590	0.3140	7.1840	9.8070	
102	11/05 16	9148.93	9148.93	3204.18	12641.7				229.150	229.050	0.3140	7.1840	9.8070	
103	11/05 22	9154.31	9154.31	3206.67	12646.6				228.790	228.690	0.3150	7.1830	9.8070	
104	11/06 04	9160.32	9160.32	3209.59	12652.0				228.410	228.310	0.3150	7.1830	9.8070	
105	11/06 10	9166.64	9166.64	3212.88	12657.8				228.030	228.020	0.3150	7.1830	9.8070	
106	11/06 16	9172.65	9172.65	3216.68	12663.7				227.690	227.590	0.3160	7.1820	9.8070	
107	11/06 23	9179.79	9179.79	3221.20	12670.2				227.380	227.280	0.3160	7.1820	9.8070	
108	11/07 05	9185.80	9185.80	3225.43	12676.6				227.040	227.030	0.3170	7.1820	9.8070	
109	11/07 11	9191.81	9191.81	3229.61	12682.5				226.750	226.650	0.3170	7.1810	9.8070	
110	11/07 13	9194.17	9194.17	3231.20	12684.7				226.660	226.560	0.3170	7.1810	9.8070	
111	11/07 19	9200.19	9200.19	3234.75	12690.0				226.370	226.270	0.3180	7.1810	9.8070	
112	11/08 01	9206.20	9206.20	3238.01	12694.8				226.120	226.020	0.3180	7.1810	9.8070	
113	11/08 05	9209.54	9209.54	3239.48	12697.21				225.990	225.890	0.3180	7.1800	9.8070	
114	11/08 11	9215.55	9215.55	3242.13	12701.37				225.750	225.650	0.3190	7.1800	9.8070	
115	11/08 17	9221.56	9221.56	3244.77	12705.33				225.540	225.440	0.3190	7.1800	9.8070	
116	11/08 22	9226.34	9226.34	3247.02	12709.0				225.310	225.210	0.3190	7.1800	9.8070	
117	11/09 04	9232.35	9232.35	3249.34	12712.97				225.070	225.060	0.3190	7.1800	9.8070	
118	11/09 10	9238.76	9238.76	3251.36	12716.6				224.810	224.710	0.3200	7.1790	9.8070	
119	11/09 16	9244.51	9244.51	3255.44	12720.51				224.810	224.710	0.3200	7.1790	9.8070	
120	11/09 22	9250.52	9250.52	3258.12	12723.0				224.810	224.710	0.3200	7.1790	9.8070	
121	11/10 04	9256.53	9256.53	3260.45	12725.2				224.810	224.710	0.3210	7.1790	9.8070	
122	11/10 10	9262.54	9262.54	3263.22	12727.8				224.810	224.710	0.3210	7.1790	9.8070	
123	11/10 13	9265.52	9265.52	3263.88	12728.4				224.810	224.710	0.3210	7.1790	9.8070	

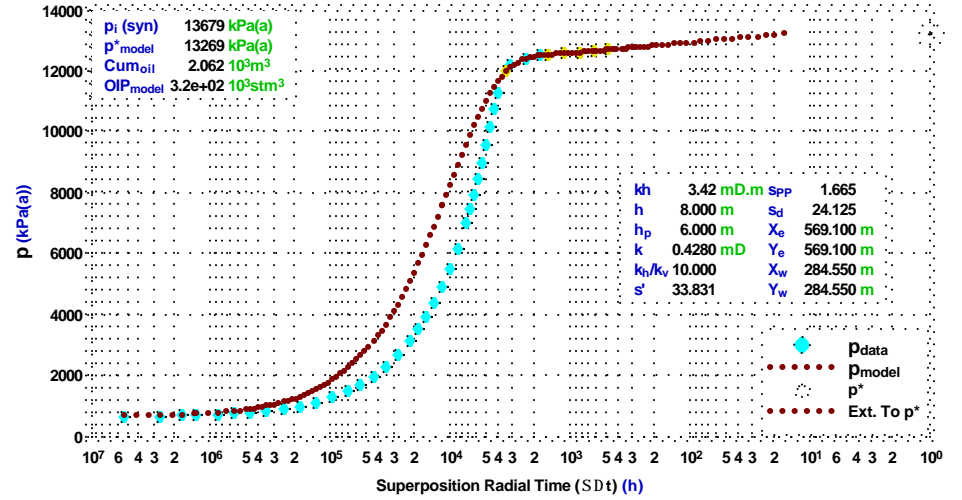
Partial Penetration 1

Linear - Channel



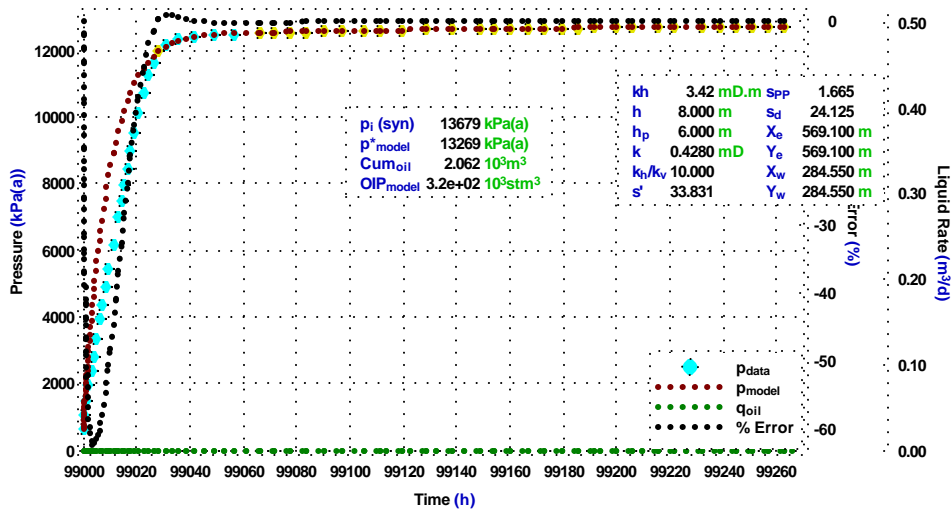
Partial Penetration 1

Radial



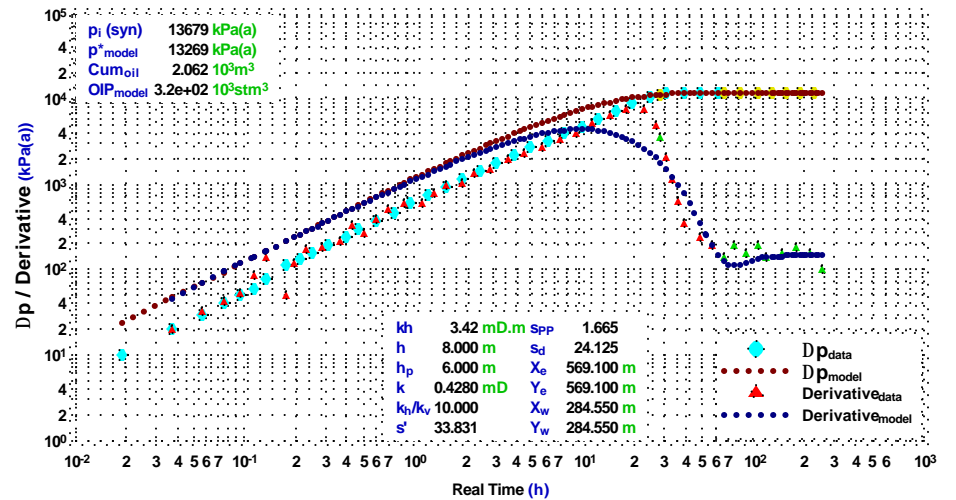
Partial Penetration 1

Total Test



Partial Penetration 1

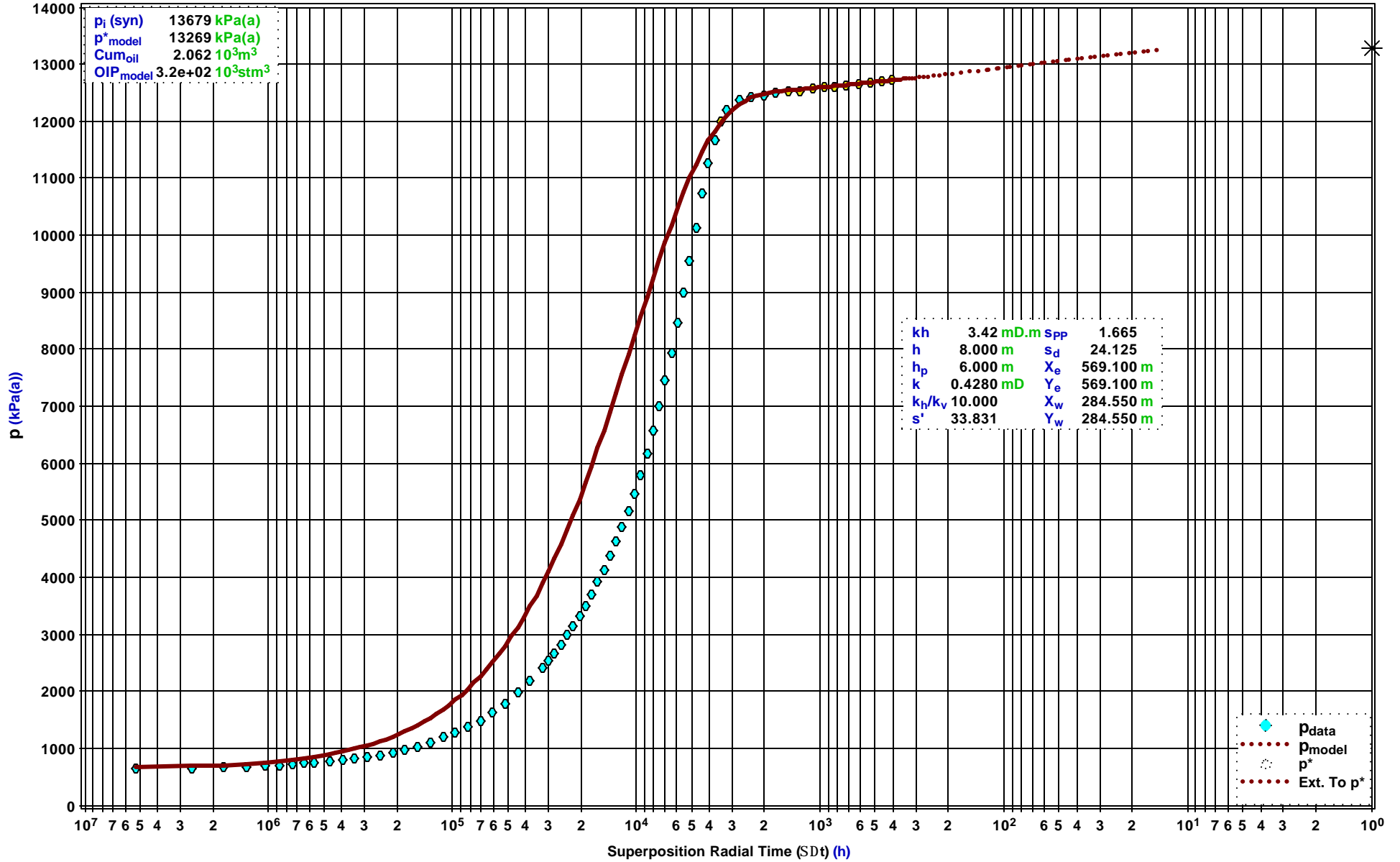
Typecurve



PENN WEST PEM
 15-32-47-7W5M
 CARDIUM
 OCTOBER 30-NOVEMBER 10, 2009

Partial Penetration 1

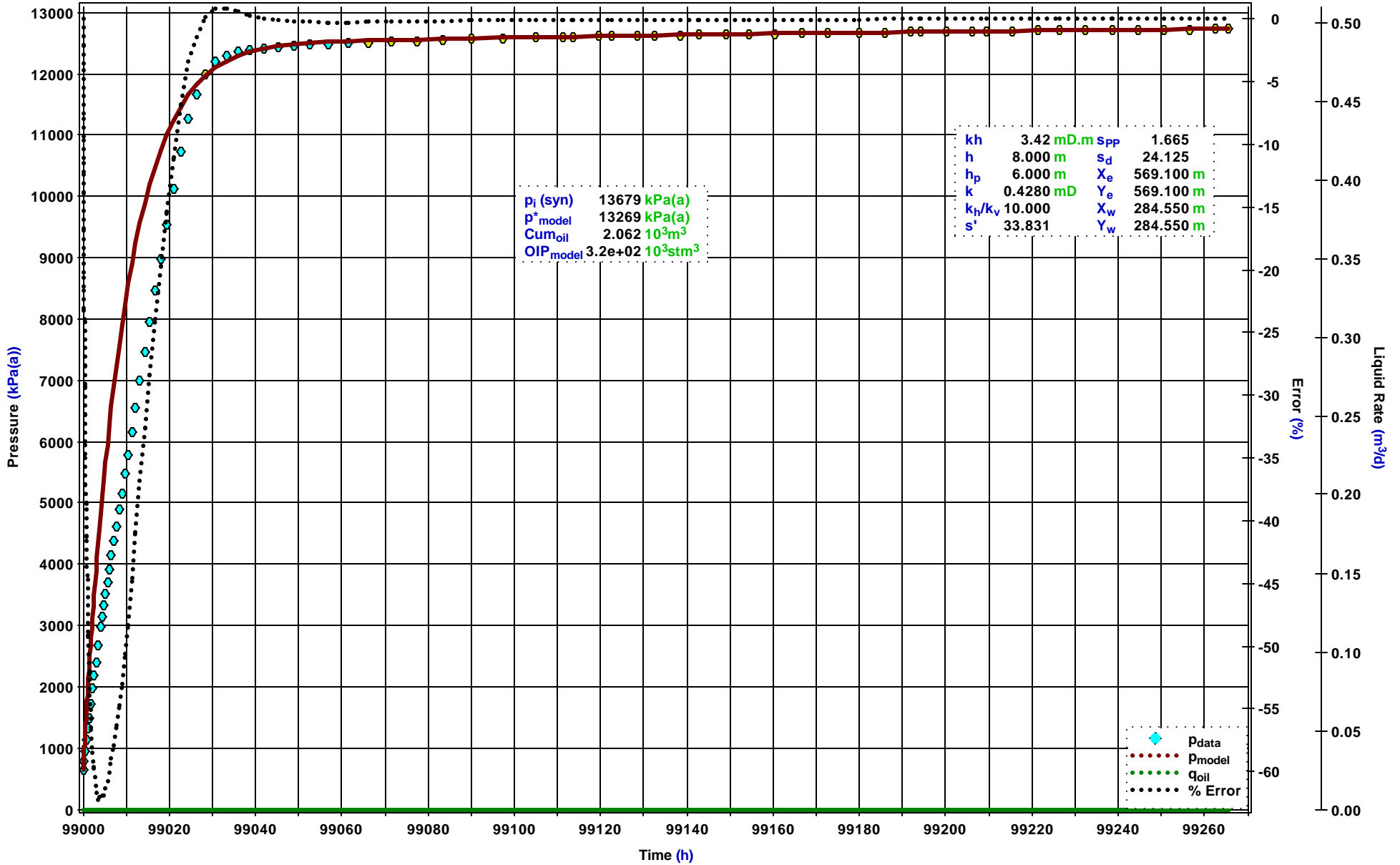
Radial



PENN WEST PEM
 15-32-47-7W5M
 CARDIUM
 OCTOBER 30-NOVEMBER 10, 2009

Partial Penetration 1

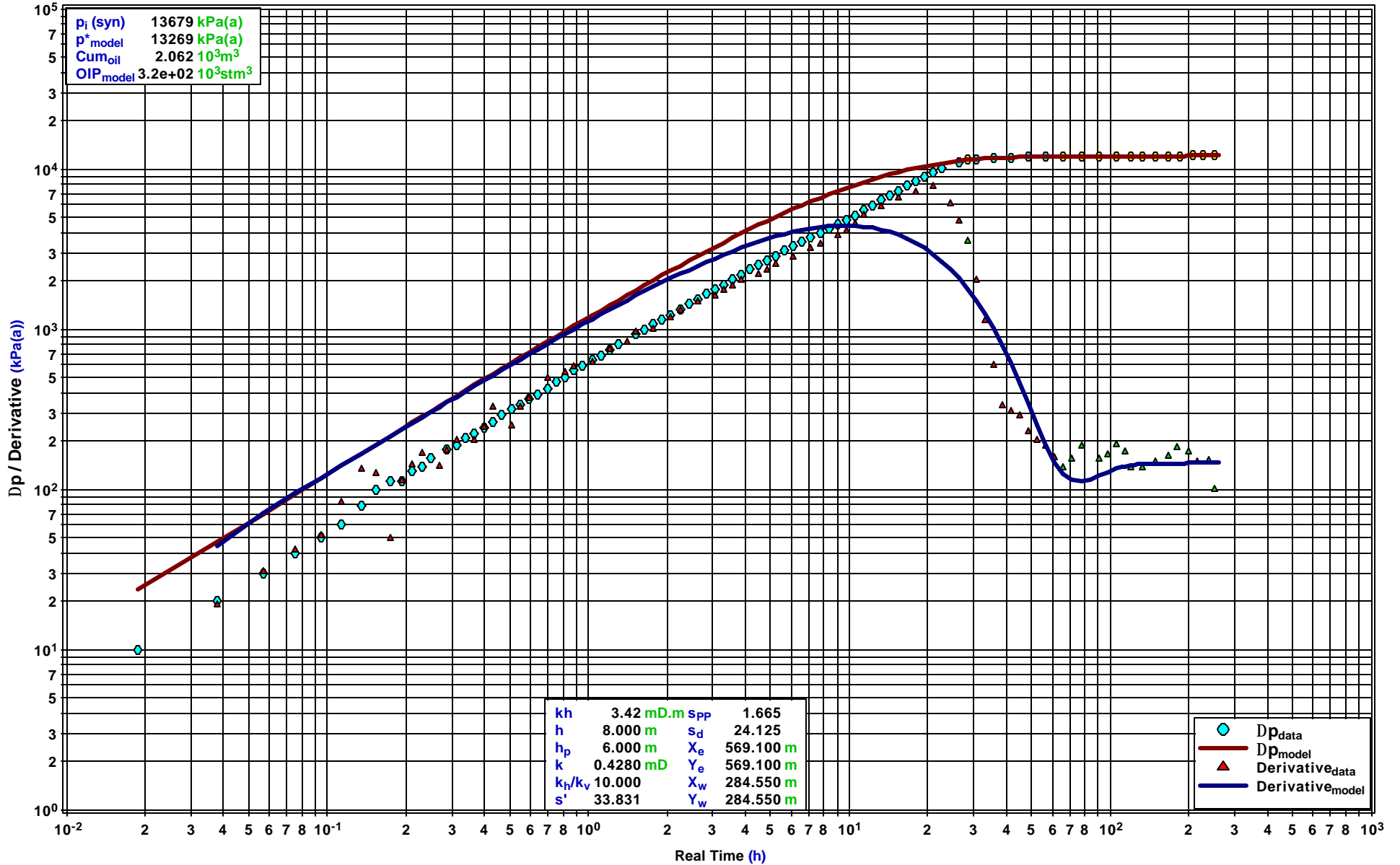
Total Test



PENN WEST PEM
 15-32-47-7W5M
 CARDIUM
 OCTOBER 30-NOVEMBER 10, 2009

Partial Penetration 1

Typecurve



Partial Penetration Oil Well Model

Case Name : Partial Penetration 1

PENN WEST PEM

15-32-47-7W5M

CARDIUM

OCTOBER 30-NOVEMBER 10, 2009

Model Parameters

Permeability (k)	0.428 mD	Perforated Interval (h_p)	6.00 m
Skin (s)	24.125	Top of Zone to Top of Perfs (h_t)	0.00 m
Total Mobility (k/μ) _t	0.45 mD/mPa.s	Reservoir Length (X_e)	569.10 m
Total Transmissivity (kh/μ) _t	3.59 mDm/mPa.s	Reservoir Width (Y_e)	569.10 m
Horizontal to Vertical Permability Ratio (k_H/k_V)	10.000	Active Well At (X_w)	284.55 m
Wellbore Storage Constant Dim. (C_D)	8.92	Active Well At (Y_w)	284.55 m

Formation Parameters

Net Pay (h)	8.00 m
Total Porosity (Φ_t)	18.20 %
Oil Saturation (S_o)	85.00 %
Gas Saturation (S_g)	0.00 %
Water Saturation (S_w)	15.00 %
Wellbore Radius (r_w)	0.091 m
Formation Temperature (T)	56.0 °C
Formation Compressibility (c_f)	5.500e-7 kPa ⁻¹
Total Compressibility (c_t)	3.660e-5 kPa ⁻¹

Production and Pressure

$Q_t B_t$	0.620 m ³ /d
Final Oil Rate	0.500 m ³ /d
Final Gas Rate	0.000 10 ³ m ³ /d
Final Water Rate	0.000 m ³ /d
Final Flowing Pressure ($P_{wf o}$)	635.44 kPa
Final Measured Pressure	12728.44 kPa
Cumulative Oil Production	2062.500 m ³

Synthesis Results

Average Error	22.28 %
Synthetic Initial Pressure (p_i)	13679.24 kPa
Extrapolated Pressure at Specified Time	13269.44 kPa
Pressure Drop Due To Skin (Δp_s)	10240.48 kPa
Flow Efficiency (FE)	0.189
Damage Ratio (DR)	5.278

Fluid Properties

Oil Compressibility (c_o)	4.23328e-5 kPa ⁻¹
Gas Compressibility (c_g)	8.64643e-5 kPa ⁻¹
Water Compressibility (c_w)	4.33803e-7 kPa ⁻¹
Oil Formation Volume Factor (B_o)	1.240
Gas Formation Volume Factor (B_g)	0.007226 m ³ /m ³
Water Formation Volume Factor (B_w)	1.008
Oil Viscosity (μ_o)	0.955 mPa.s
Gas Viscosity (μ_g)	15.901 μ Pa.s
Water Viscosity (μ_w)	0.492 mPa.s
Solution Gas Ratio (R_s)	74 m ³ /m ³
Oil Gravity (γ_o)	0.840
Gas Gravity (G)	0.700
PVT Reference Pressure (p_{pVT})	12728.44 kPa
Bubble Point Pressure (P_{bp})	12735.33 kPa

Forecasts

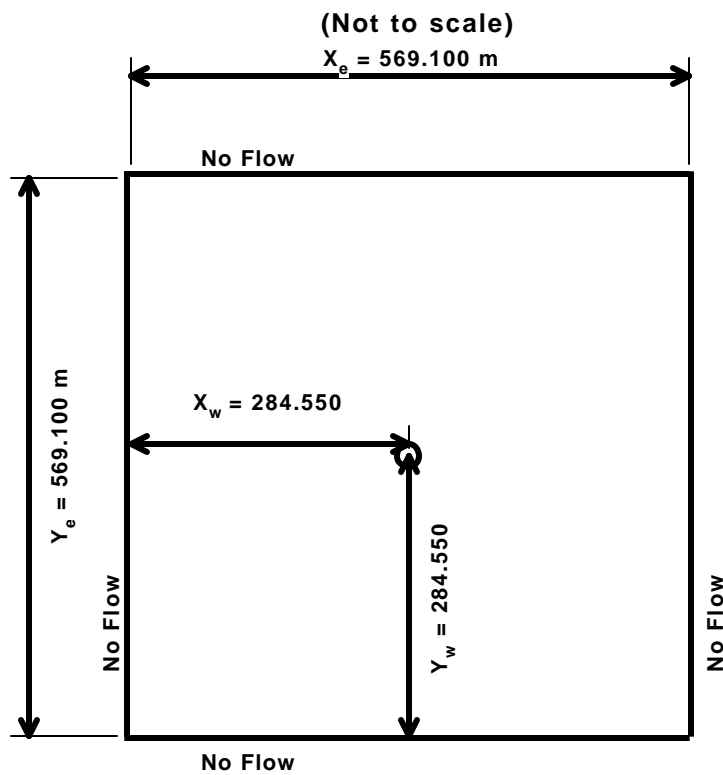
Forecast Flowing Pressure ($P_{f low}$)	635.44 kPa
3 - Month Constant Rate Forecast @ Curr. Skin	0.508 m ³ /d
6 - Month Constant Rate Forecast @ Curr. Skin	0.504 m ³ /d
Forecast Flow Duration ($t_{f low}$)	12.00 month
Constant Rate Forecast @ Curr. Skin	0.499 m ³ /d
PI / II (Total Liquids - Actual)	3.99e-5 m ³ /d/kPa
Constant Rate Forecast @ Skin=0	2.622 m ³ /d
PI / II (Total Liquids - Ideal)	2.18e-4 m ³ /d/kPa
Constant Rate Forecast @ Skin=-4	7.444 m ³ /d

Partial Penetration 1

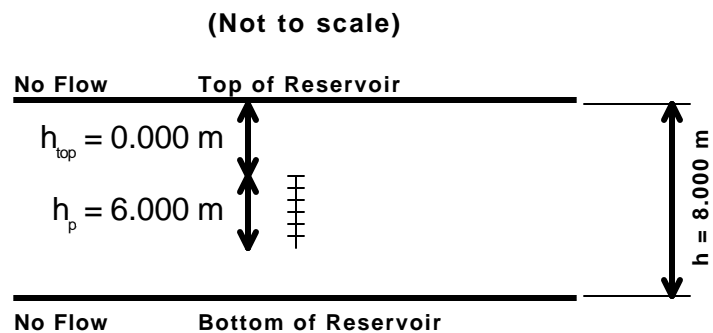
PENN WEST PEM
15-32-47-7W5M
CARDIUM
OCTOBER 30-NOVEMBER 10, 2009

$k = 0.4280 \text{ mD}$
 $s_d = 24.125$
 $OIP_{\text{model}} = 3.2e+02 \cdot 10^3 \text{ stm}^3$

Plan View



Side View



Partial Penetration Oil Well Model

Case Name : Partial Penetration 1

PENN WEST PEM

CARDIUM

15-32-47-7W5M

OCTOBER 30-NOVEMBER 10, 2009

Model Parameters

Permeability (k)	0.428 mD	Perforated Interval (h_p)	6.00 m
Skin (s)	24.125	Top of Zone to Top of Perfs (h_t)	0.00 m
Total Mobility (k/μ) _t	0.45 mD/mPa.s	Reservoir Length (X_e)	569.10 m
Total Transmissivity (kh/μ) _t	3.59 mDm/mPa.s	Reservoir Width (Y_e)	569.10 m
Horizontal to Vertical Permability Ratio (k_H/k_V)	10.000	Active Well At (X_w)	284.55 m
Wellbore Storage Constant Dim. (C_D)	8.92	Active Well At (Y_w)	284.55 m

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Net Pay (h)	8.00 m
Total Porosity (Φ_t)	18.20 %
Oil Saturation (S_o)	85.00 %
Gas Saturation (S_g)	0.00 %
Water Saturation (S_w)	15.00 %
Wellbore Radius (r_w)	0.091 m
Formation Temperature (T)	56.0 °C
Formation Compressibility (c_f)	5.500e-7 kPa ⁻¹
Total Compressibility (c_t)	3.660e-5 kPa ⁻¹

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Final Gas Rate	0.000 10 ³ m ³ /d
Final Water Rate	0.000 m ³ /d
Final Flowing Pressure ($P_{wf o}$)	635.44 kPa
Final Measured Pressure	12728.44 kPa
Cumulative Oil Production	2062.500 m ³

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Water Formation Volume Factor (B_w)	1.008
Oil Viscosity (μ_o)	0.955 mPa.s
Gas Viscosity (μ_g)	15.901 μ Pa.s
Water Viscosity (μ_w)	0.492 mPa.s
Solution Gas Ratio (R_s)	74 m ³ /m ³
Oil Gravity (γ_o)	0.840
Gas Gravity (G)	0.700
PVT Reference Pressure (p_{pVT})	12728.44 kPa
Bubble Point Pressure (P_{bp})	12735.33 kPa

Forecasts

Forecast Flowing Pressure ($P_{f low}$)	635.44 kPa
3 - Month Constant Rate Forecast @ Curr. Skin	0.508 m ³ /d
6 - Month Constant Rate Forecast @ Curr. Skin	0.504 m ³ /d
Forecast Flow Duration ($t_{f low}$)	1.00 month
Constant Rate Forecast @ Curr. Skin	0.516 m ³ /d
PI / II (Total Liquids - Actual)	4.09e-5 m ³ /d/kPa
Constant Rate Forecast @ Skin=0	3.137 m ³ /d
PI / II (Total Liquids - Ideal)	2.50e-4 m ³ /d/kPa
Constant Rate Forecast @ Skin=-4	12.997 m ³ /d

Acoustic Buildup

Penn West Petroleum Ltd.

Surface: 02-05-048-07 W5M

Downhole: 100/15-32-047-07 W5M/00



Wellname: Penn West Pem 15-32-47-7W5	Formation: Cardium	Status: Oil Well
Field name: Pembina	License #: 0299439	

KB (m): 829.16	KB to CF (m): 4.95	Oil Rate (m3pd): 0.50	Gas Gravity: 0.70
Tubing bottom (mKB): 1605.28	Surface Temp (C): 2.20	Water Rate (m3pd): 0.00	Oil Gravity (API): 37.00
Number of Joints: 168	Reservoir Temp (C): 56.00	Gas Rate (M m3pd): 0.00	Water Gravity: 1.00

Perforations Measured Depths:	Top of Perfs (mKB): 1585.00	Bottom of Perfs (mKB): 1591.00	Mid-Point of Perfs (mKB): 1588.00
True Vertical Depths:	1472.00	1478.00	1475.00

Date	Time	Shut-in Time (hrs)	Joints to Fluid	Column Heights (mCF TVD)			Gradients (kPa/m)			Pressure (kPa(a))				MPP
				Gas	Oil	Inflow	Gas	Oil	Inflow	Surface	Interface	Oil	Inflow	
2009-10-30	11:41:45	0.0000	165.4	1463.1	7.0	0.0	0.044	7.877	7.877	514.96	64.97	55.51	0.00	635.44
2009-10-30	11:42:53	0.0189	165.3	1462.0	7.0	1.2	0.044	7.877	7.875	515.75	65.02	55.51	9.11	645.39
2009-10-30	11:44:01	0.0378	165.1	1460.8	7.0	2.3	0.045	7.878	7.875	516.66	65.09	55.51	18.29	655.54
2009-10-30	11:45:09	0.0567	165.0	1459.6	7.0	3.5	0.045	7.878	7.875	517.22	65.11	55.51	27.39	665.23
2009-10-30	11:46:17	0.0756	164.9	1458.5	7.0	4.6	0.045	7.878	7.874	518.06	65.16	55.51	36.50	675.24
2009-10-30	11:47:24	0.0942	164.8	1457.3	7.0	5.8	0.045	7.878	7.874	519.17	65.26	55.52	45.53	685.48
2009-10-30	11:48:32	0.1131	164.6	1456.2	7.0	6.9	0.045	7.879	7.874	519.91	65.30	55.52	54.64	695.37
2009-10-30	11:49:49	0.1344	164.4	1453.9	7.0	9.3	0.045	7.879	7.874	520.71	65.30	55.52	72.84	714.37
2009-10-30	11:50:56	0.1531	164.1	1451.6	7.0	11.6	0.045	7.880	7.874	521.60	65.31	55.53	91.05	733.49
2009-10-30	11:52:13	0.1744	163.9	1450.0	7.0	13.1	0.045	7.880	7.874	522.70	65.39	55.53	103.19	746.80
2009-10-30	11:53:21	0.1933	163.9	1450.0	7.0	13.1	0.045	7.880	7.874	523.35	65.47	55.53	103.19	747.54
2009-10-30	11:54:28	0.2119	163.7	1447.7	7.0	15.4	0.045	7.881	7.874	523.90	65.44	55.53	121.39	766.26
2009-10-30	11:55:35	0.2306	163.6	1446.9	7.0	16.2	0.045	7.881	7.873	524.72	65.51	55.53	127.46	773.22
2009-10-30	11:56:43	0.2494	163.3	1444.6	7.0	18.5	0.045	7.881	7.873	525.90	65.55	55.54	145.66	792.65
2009-10-30	11:57:51	0.2683	163.3	1443.8	7.0	19.3	0.045	7.882	7.873	526.53	65.60	55.54	151.73	799.40
2009-10-30	11:59:02	0.2881	163.1	1442.3	7.0	20.8	0.045	7.882	7.873	527.25	65.62	55.54	163.87	812.28
2009-10-30	12:00:30	0.3125	162.9	1440.8	7.0	22.4	0.046	7.882	7.873	528.11	65.66	55.54	176.01	825.32
2009-10-30	12:02:05	0.3389	162.6	1438.4	7.0	24.7	0.046	7.883	7.873	529.27	65.71	55.55	194.21	844.73
2009-10-30	12:03:48	0.3675	162.5	1436.9	7.0	26.2	0.046	7.883	7.873	530.28	65.77	55.55	206.34	857.94
2009-10-30	12:05:39	0.3983	162.2	1434.6	7.0	28.5	0.046	7.884	7.872	531.48	65.81	55.55	224.55	877.39
2009-10-30	12:07:39	0.4317	162.0	1432.3	7.0	30.8	0.046	7.884	7.872	532.66	65.86	55.56	242.74	896.82
2009-10-30	12:09:49	0.4678	161.5	1428.4	7.0	34.7	0.046	7.885	7.872	534.46	65.91	55.56	273.07	929.01
2009-10-30	12:12:10	0.5069	161.3	1426.1	7.0	37.0	0.046	7.886	7.872	535.93	65.99	55.57	291.27	948.76
2009-10-30	12:14:41	0.5489	161.0	1423.8	7.0	39.3	0.046	7.886	7.871	537.54	66.09	55.57	309.47	968.67
2009-10-30	12:17:25	0.5944	160.6	1420.0	7.0	43.2	0.047	7.887	7.871	539.22	66.12	55.58	339.77	1000.69
2009-10-30	12:20:21	0.6433	160.2	1416.9	7.0	46.2	0.047	7.888	7.871	541.12	66.22	55.58	364.01	1026.93
2009-10-30	12:23:31	0.6961	159.8	1413.0	7.0	50.1	0.047	7.889	7.870	543.02	66.28	55.59	394.30	1059.19
2009-10-30	12:26:57	0.7533	159.2	1407.6	7.0	55.5	0.047	7.890	7.870	544.83	66.26	55.60	436.71	1103.40
2009-10-30	12:30:39	0.8150	158.8	1403.8	7.0	59.3	0.047	7.891	7.869	547.09	66.36	55.61	467.01	1136.06
2009-10-30	12:34:39	0.8817	158.1	1397.6	7.0	65.5	0.048	7.893	7.869	549.62	66.39	55.62	515.47	1187.09
2009-10-30	12:38:57	0.9533	157.6	1393.0	7.0	70.1	0.048	7.894	7.868	552.24	66.49	55.62	551.80	1226.16
2009-10-30	12:43:37	1.0311	156.9	1386.8	7.0	76.3	0.048	7.895	7.868	555.12	66.56	55.63	600.24	1277.55
2009-10-30	12:48:39	1.1150	156.3	1381.4	7.0	81.7	0.048	7.897	7.867	558.14	66.67	55.64	642.62	1323.08
2009-10-30	12:54:05	1.2056	155.7	1376.0	7.0	87.1	0.049	7.898	7.867	561.66	66.85	55.65	684.99	1369.15
2009-10-30	12:59:57	1.3033	154.7	1367.6	7.0	95.5	0.049	7.900	7.866	564.99	66.84	55.67	751.58	1439.08
2009-10-30	13:06:17	1.4089	154.1	1362.2	7.0	100.9	0.049	7.901	7.865	568.72	67.03	55.68	793.93	1485.36
2009-10-30	13:13:07	1.5228	153.0	1352.2	7.0	111.0	0.050	7.904	7.864	572.76	67.04	55.69	872.58	1568.07
2009-10-30	13:20:33	1.6467	152.2	1344.5	7.0	118.6	0.050	7.905	7.863	577.37	67.21	55.71	932.96	1633.24
2009-10-30	13:28:28	1.7786	151.1	1335.4	7.0	127.7	0.050	7.908	7.862	581.84	67.29	55.72	1004.00	1708.86
2009-10-30	13:37:04	1.9219	150.1	1326.4	7.0	136.7	0.051	7.910	7.861	587.03	67.46	55.74	1075.01	1785.23
2009-10-30	13:46:21	2.0767	149.1	1317.3	7.0	145.8	0.051	7.912	7.860	592.98	67.70	55.75	1145.99	1862.42
2009-10-30	13:56:28	2.2453	147.6	1304.5	7.0	158.6	0.052	7.915	7.859	598.97	67.75	55.77	1246.53	1969.02
2009-10-30	14:07:17	2.4256	146.3	1293.2	7.0	169.9	0.053	7.918	7.857	605.65	67.94	55.79	1335.19	2064.57
2009-10-30	14:18:58	2.6203	144.8	1279.6	7.0	183.5	0.053	7.921	7.856	612.98	68.07	55.81	1441.56	2178.42
2009-10-30	14:31:40	2.8319	143.2	1266.0	7.0	197.1	0.054	7.924	7.854	621.21	68.29	55.84	1547.85	2293.18
2009-10-30	14:45:11	3.0572	141.8	1253.2	7.0	209.9	0.055	7.927	7.852	630.04	68.59	55.86	1648.18	2402.67

Acoustic Buildup

Penn West Petroleum Ltd.

Surface: 02-05-048-07 W5M

Downhole: 100/15-32-047-07 W5M/00

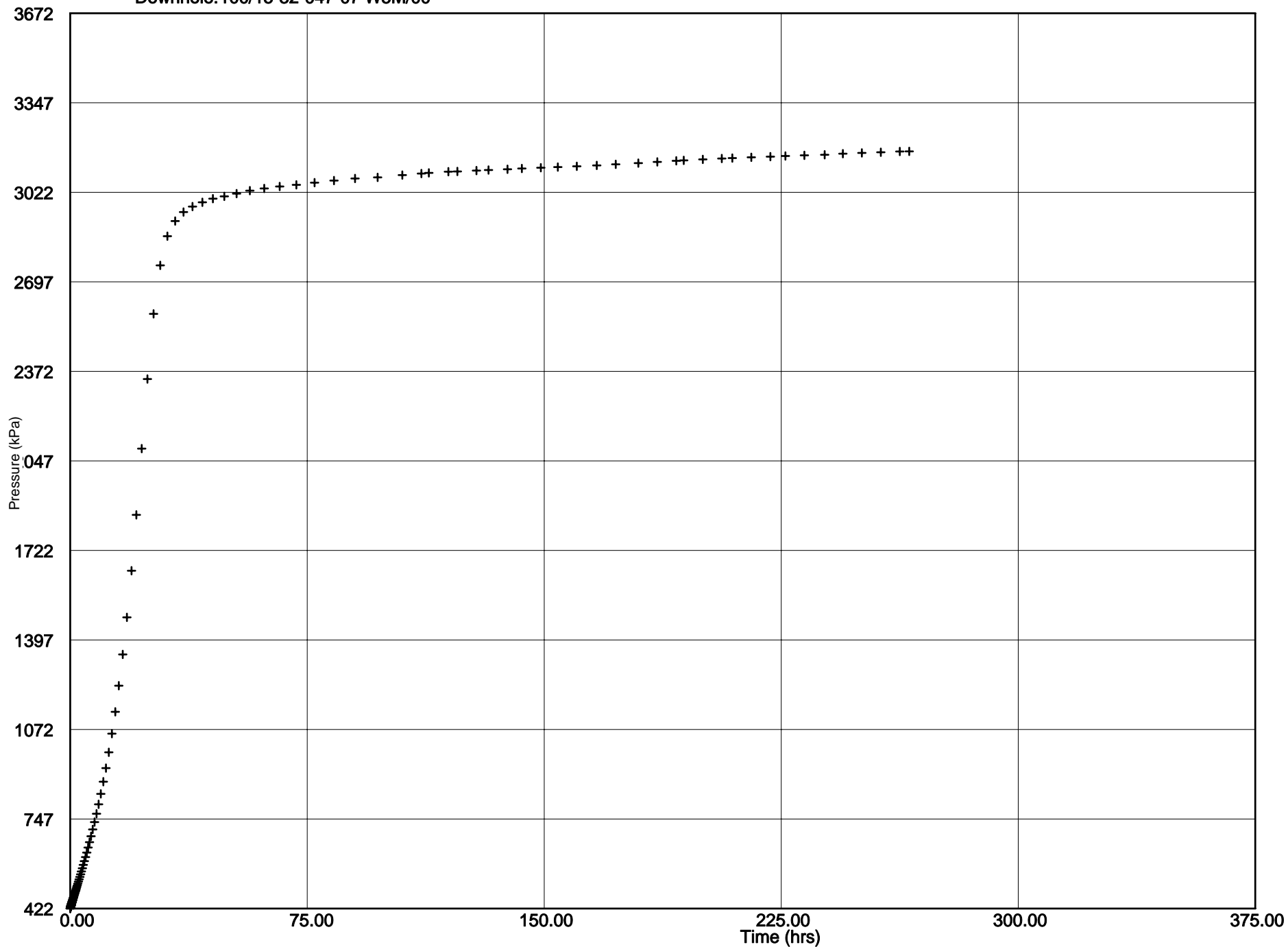


Date	Time	Shut-in Time (hrs)	Joints to Fluid	Column Heights (mCF TVD)			Gradients (kPa/m)			Pressure (kPa(a))		MPP		
				Gas	Oil	Inflow	Gas	Oil	Inflow	Surface	Interface			
2009-10-30	14:59:53	3.3022	139.9	1237.4	7.0	225.7	0.056	7.931	7.850	639.40	68.77	55.88	1772.08	2536.13
2009-10-30	15:15:47	3.5672	138.1	1221.5	7.0	241.6	0.057	7.934	7.848	649.86	69.04	55.91	1895.87	2670.69
2009-10-30	15:33:02	3.8547	136.1	1203.4	7.0	259.7	0.058	7.939	7.846	661.45	69.28	55.94	2037.28	2823.95
2009-10-30	15:51:34	4.1636	133.9	1185.1	7.0	278.1	0.059	7.943	7.843	673.86	69.56	55.97	2180.80	2980.19
2009-10-30	16:11:34	4.4969	131.6	1165.7	7.0	297.4	0.060	7.947	7.840	687.31	69.84	56.00	2331.73	3144.88
2009-10-30	16:33:18	4.8592	129.2	1145.6	7.0	317.5	0.061	7.952	7.837	701.94	70.16	56.03	2488.11	3316.24
2009-10-30	16:56:37	5.2478	126.5	1123.4	7.0	339.7	0.063	7.957	7.834	718.38	70.48	56.07	2661.08	3506.01
2009-10-30	17:21:49	5.6678	123.8	1100.5	7.0	362.6	0.064	7.962	7.830	736.42	70.85	56.10	2839.42	3702.79
2009-10-30	17:49:07	6.1228	120.9	1076.4	7.0	386.8	0.066	7.967	7.826	756.20	71.23	56.14	3026.78	3910.35
2009-10-30	18:18:29	6.6122	117.6	1050.3	7.0	412.8	0.068	7.973	7.822	777.70	71.57	56.18	3229.23	4134.68
2009-10-30	18:50:24	7.1442	114.2	1023.5	7.0	439.6	0.070	7.979	7.817	802.28	72.05	56.22	3436.68	4367.23
2009-10-30	19:24:39	7.7150	110.5	994.0	7.0	469.2	0.073	7.985	7.812	829.16	72.42	56.27	3665.08	4622.92
2009-10-30	20:01:37	8.3311	106.8	963.7	7.0	499.4	0.076	7.992	7.806	859.33	72.89	56.31	3898.35	4886.88
2009-10-30	20:41:32	8.9964	102.9	932.8	7.0	530.3	0.079	7.998	7.800	893.43	73.48	56.36	4136.42	5159.69
2009-10-30	21:24:39	9.7150	98.5	897.8	7.0	565.3	0.082	8.005	7.794	931.30	73.87	56.41	4405.76	5467.34
2009-10-30	22:11:12	10.4908	94.1	862.6	7.0	600.5	0.086	8.012	7.786	975.48	74.51	56.46	4675.37	5781.81
2009-10-30	23:01:28	11.3286	89.2	819.1	7.0	644.0	0.091	8.020	7.777	1024.86	74.52	56.52	5008.75	6164.64
2009-10-30	23:55:32	12.2297	84.2	774.8	7.0	688.3	0.096	8.029	7.768	1082.44	74.67	56.57	5346.75	6560.43
2009-10-31	00:54:27	13.2117	78.8	726.6	7.0	736.5	0.103	8.037	7.757	1150.10	74.66	56.64	5712.58	6993.97
2009-10-31	01:57:46	14.2669	73.1	676.2	7.0	786.9	0.110	8.046	7.745	1229.38	74.56	56.69	6094.13	7454.76
2009-10-31	03:06:01	15.4044	67.3	624.3	7.0	838.8	0.119	8.053	7.731	1324.10	74.47	56.75	6485.06	7940.38
2009-10-31	04:20:31	16.6461	61.2	570.0	7.0	893.1	0.130	8.060	7.716	1437.67	74.23	56.79	6890.70	8459.39
2009-10-31	05:39:57	17.9700	55.3	517.3	7.0	945.8	0.143	8.064	7.699	1572.20	74.13	56.83	7281.61	8984.76
2009-10-31	07:05:57	19.4033	49.2	463.8	7.0	999.3	0.160	8.066	7.679	1741.28	74.18	56.84	7674.00	9546.30
2009-10-31	08:38:50	20.9514	43.4	411.9	7.0	1051.2	0.180	8.065	7.658	1944.34	74.22	56.83	8050.55	10125.95
2009-10-31	10:19:42	22.6325	37.9	360.5	7.0	1102.6	0.205	8.060	7.634	2184.90	73.79	56.80	8417.40	10732.88
2009-10-31	12:08:23	24.4439	33.5	319.1	7.0	1144.0	0.231	8.051	7.610	2437.39	73.69	56.73	8706.42	11274.23
2009-10-31	14:05:23	26.3939	31.2	297.1	7.0	1166.0	0.256	8.038	7.591	2673.74	76.05	56.64	8850.70	11657.12
2009-10-31	16:11:38	28.4981	28.7	273.4	7.0	1189.7	0.275	8.030	7.575	2850.01	75.19	56.58	9011.99	11993.78
2009-10-31	18:28:01	30.7711	27.2	259.5	7.0	1203.6	0.287	8.025	7.566	2955.84	74.37	56.55	9106.35	12193.11
2009-10-31	20:55:08	33.2231	26.4	251.7	7.0	1211.4	0.293	8.022	7.561	3010.66	73.67	56.53	9159.20	12300.06
2009-10-31	23:34:07	35.8728	25.9	247.0	7.0	1216.1	0.296	8.021	7.558	3043.43	73.20	56.52	9190.97	12364.12
2009-11-01	02:25:38	38.7314	25.8	245.9	7.0	1217.2	0.299	8.019	7.556	3063.32	73.40	56.51	9197.73	12390.96
2009-11-01	05:32:08	41.8397	25.7	244.6	7.0	1218.5	0.300	8.018	7.555	3078.91	73.46	56.50	9205.55	12414.42
2009-11-01	08:52:16	45.1753	25.5	243.1	7.0	1220.0	0.302	8.018	7.554	3091.98	73.34	56.50	9216.04	12437.86
2009-11-01	12:27:45	48.7667	25.3	241.4	7.0	1221.8	0.303	8.017	7.553	3100.27	73.05	56.50	9227.92	12457.73
2009-11-01	16:21:01	52.6544	25.3	240.6	7.0	1222.6	0.304	8.017	7.552	3110.19	73.07	56.49	9232.98	12472.73
2009-11-01	20:32:45	56.8500	25.2	239.8	7.0	1223.3	0.305	8.016	7.551	3121.29	73.13	56.49	9237.80	12488.71
2009-11-02	01:06:31	61.4128	25.1	239.0	7.0	1224.1	0.306	8.016	7.551	3128.91	73.10	56.48	9242.70	12501.20
2009-11-02	06:00:00	66.3042	25.0	238.4	7.0	1224.8	0.307	8.015	7.550	3136.35	73.10	56.48	9246.99	12512.92
2009-11-02	11:17:16	71.5919	25.0	237.8	7.0	1225.3	0.307	8.015	7.550	3142.17	73.10	56.48	9250.28	12522.03
2009-11-02	17:01:49	77.3344	24.9	236.9	7.0	1226.2	0.308	8.014	7.549	3150.35	73.02	56.47	9256.61	12536.46
2009-11-02	23:11:34	83.4969	24.8	235.9	7.0	1227.2	0.309	8.014	7.548	3157.91	72.91	56.47	9263.34	12550.64
2009-11-03	05:50:49	90.1511	24.7	235.0	7.0	1228.1	0.310	8.014	7.548	3165.24	72.84	56.47	9268.97	12563.52
2009-11-03	13:00:34	97.3136	24.6	234.1	7.0	1229.0	0.310	8.014	7.547	3169.26	72.66	56.47	9275.50	12573.89
2009-11-03	20:49:04	105.1219	24.5	233.1	7.0	1230.0	0.311	8.013	7.546	3177.55	72.58	56.47	9281.96	12588.55
2009-11-04	02:49:43	111.1328	24.4	232.5	7.0	1230.7	0.312	8.013	7.546	3183.37	72.52	56.46	9286.44	12598.80
2009-11-04	05:11:34	113.4969	24.4	232.2	7.0	1230.9	0.312	8.013	7.546	3185.66	72.50	56.46	9288.07	12601.70
2009-11-04	11:22:14	119.6747	24.3	231.6	7.0	1231.5	0.313	8.013	7.545	3189.90	72.42	56.46	9292.34	12611.12
2009-11-04	14:14:34	122.5469	24.3	231.3	7.0	1231.8	0.313	8.013	7.545	3190.99	72.36	56.46	9294.29	12614.09
2009-11-04	20:15:13	128.5578	24.2	230.8	7.0	1232.4	0.313	8.012	7.545	3193.98	72.26	56.46	9298.10	12620.80
2009-11-05	00:04:04	132.3719	24.2	230.5	7.0	1232.6	0.313	8.012	7.545	3195.87	72.23	56.46	9299.90	12624.46
2009-11-05	06:04:43	138.3828	24.1	229.9	7.0	1233.2	0.314	8.012	7.545	3198.94	72.14	56.46	9303.71	12631.25
2009-11-05	10:37:04	142.9219	24.1	229.7	7.0	1233.4	0.314	8.012	7.544	3201.45	72.12	56.46	9305.39	12635.42
2009-11-05	16:37:42	148.9325	24.1	229.2	7.0	1234.0	0.314	8.012	7.544	3204.18	72.02	56.46	9309.09	12641.75
2009-11-05	22:00:33	154.3133	24.0	228.8	7.0	1234.3	0.315	8.012	7.544	3206.67	71.97	56.46	9311.54	12646.64
2009-11-06	04:01:11	160.3239	24.0	228.4	7.0	1234.7	0.315	8.012	7.544	3209.59	71.93	56.46	9314.10	12652.07
2009-11-06	10:20:33	166.6467	23.9	228.0	7.0	1235.1	0.315	8.012	7.543	3212.88	71.89	56.45	9316.62	12657.85
2009-11-06	16:21:11	172.6572	23.9	227.7	7.0	1235.4	0.316	8.011	7.543	3216.68	71.89	56.45	9318.75	12663.77
2009-11-06	23:29:33	179.7967	23.9	227.4	7.0	1235.7	0.316	8.011	7.543	3221.20	71.90	56.45	9320.69	12670.24

Casing Pressure vs Time

Company: Penn West Petroleum Ltd.
Surface: 02-05-048-07 W5M
Downhole: 100/15-32-047-07 W5M/00

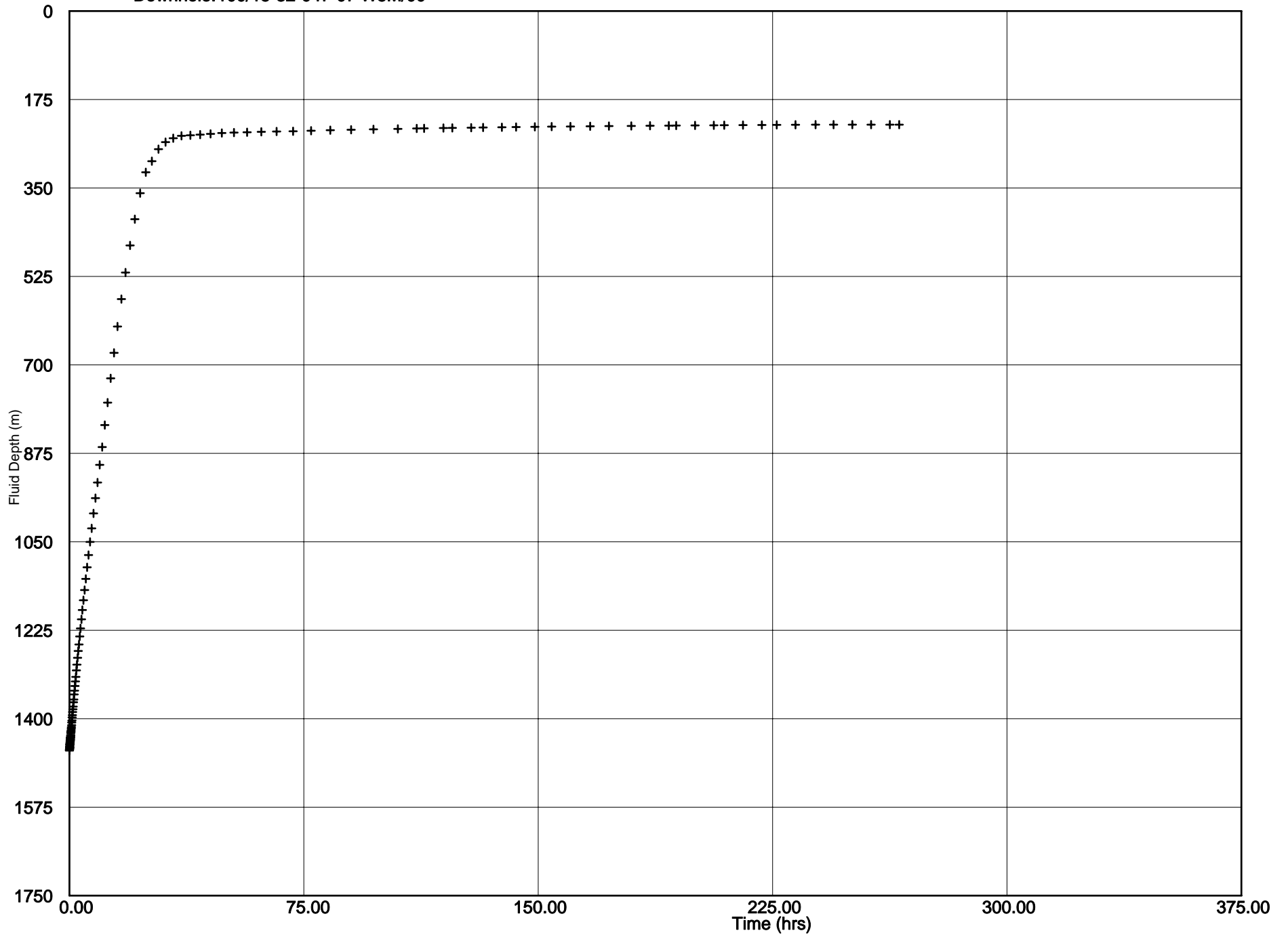
Start of Test: 2009-10-30 11:41:45
Last Shot: 2009-11-10 13:13:23



Fluid Level vs Time

Company: Penn West Petroleum Ltd.
Surface: 02-05-048-07 W5M
Downhole: 100/15-32-047-07 W5M/00

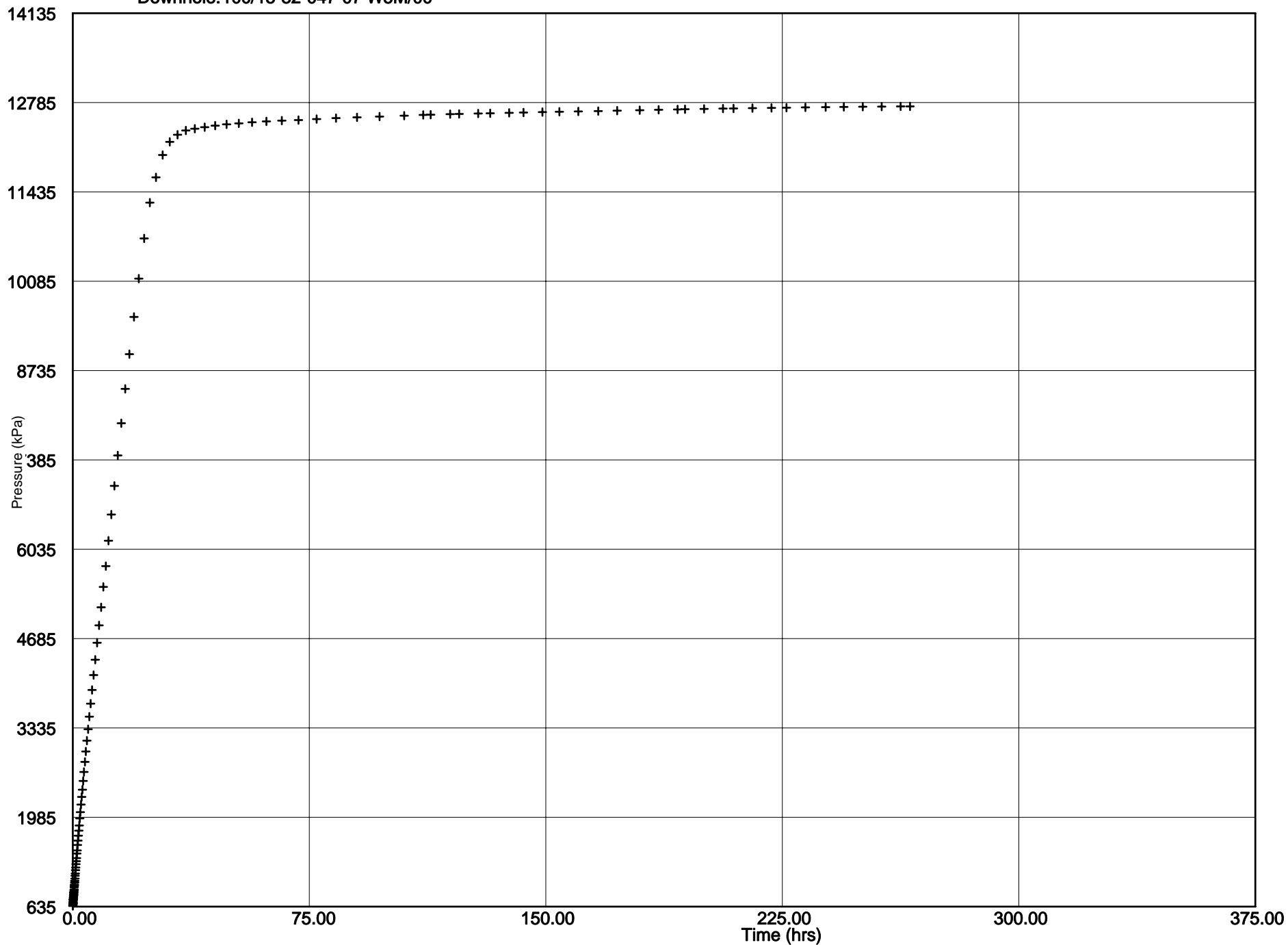
Start of Test: 2009-10-30 11:41:45
Last Shot: 2009-11-10 13:13:23



Bottom Hole Pressure vs Time

Company: Penn West Petroleum Ltd.
Surface: 02-05-048-07 W5M
Downhole: 100/15-32-047-07 W5M/00

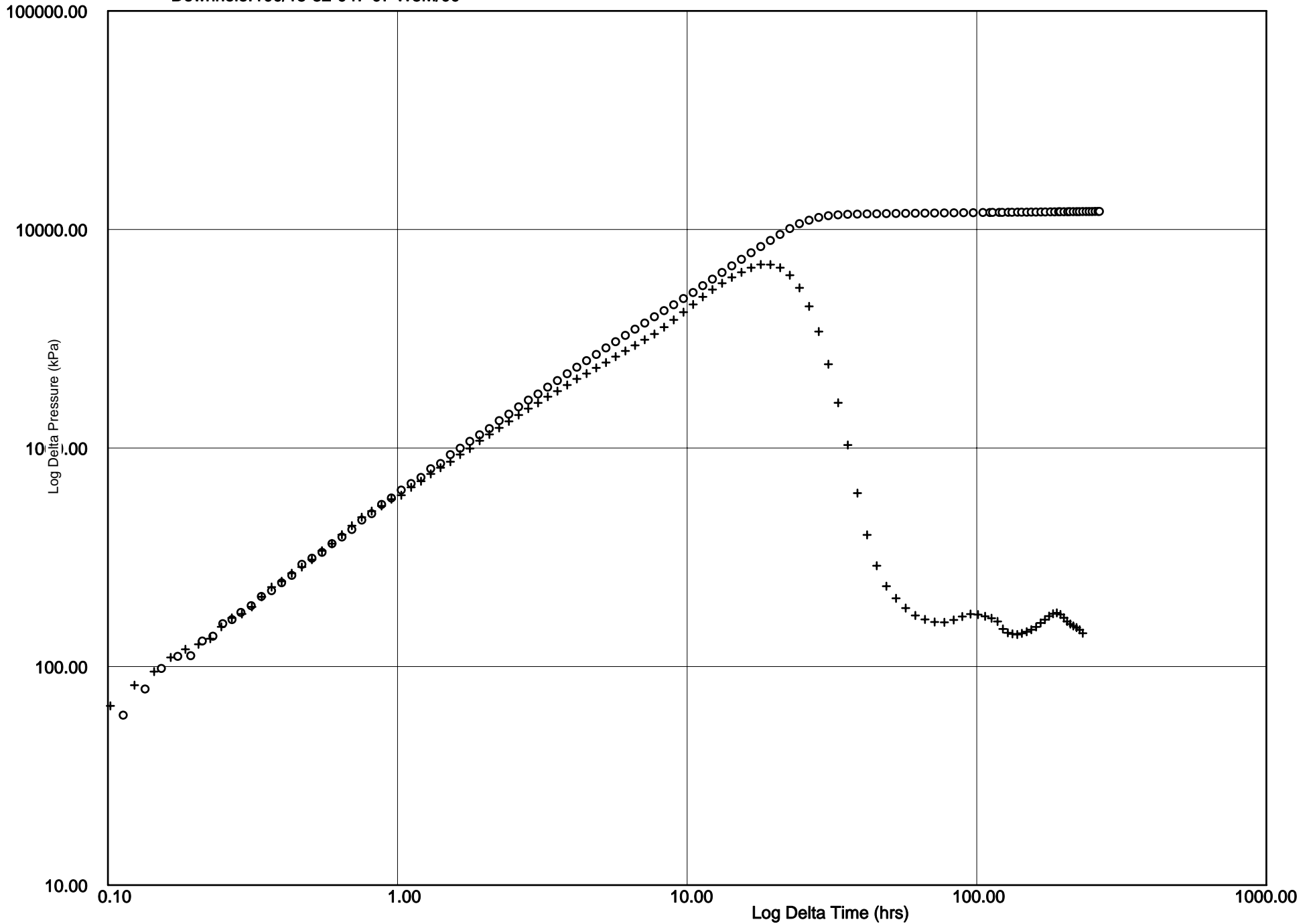
Start of Test: 2009-10-30 11:41:45
Last Shot: 2009-11-10 13:13:23



Type Curve Plot

Company: Penn West Petroleum Ltd.
Surface: 02-05-048-07 W5M
Downhole: 100/15-32-047-07 W5M/00

Start of Test: 2009-10-30 11:41:45
Last Shot: 2009-11-10 13:13:23



kPa/hr vs Time

Company: Penn West Petroleum Ltd.
Surface: 02-05-048-07 W5M
Downhole: 100/15-32-047-07 W5M/00

Start of Test: 2009-10-30 11:41:45
Last Shot: 2009-11-10 13:13:23
Last Pressure Drop: 0.21 (kPa/hr)

