



Waterflood Progress Report

2014

East Manson Unit #3

Sections 20 & 21 TWP 13 RNG 28 W1M

Prepared by:

Derek [REDACTED]

Figure 1: Rate vs Time of EMU #3

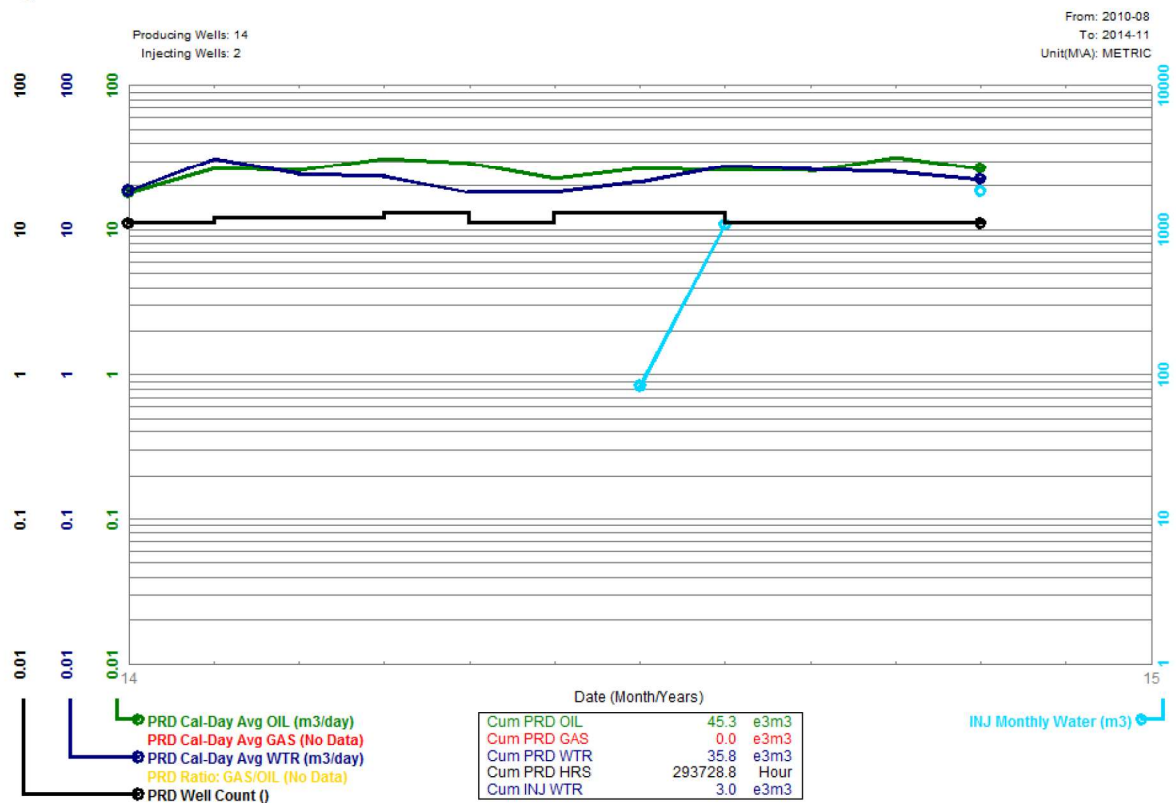


Figure 2: Rate vs Cum Production of EMU #3

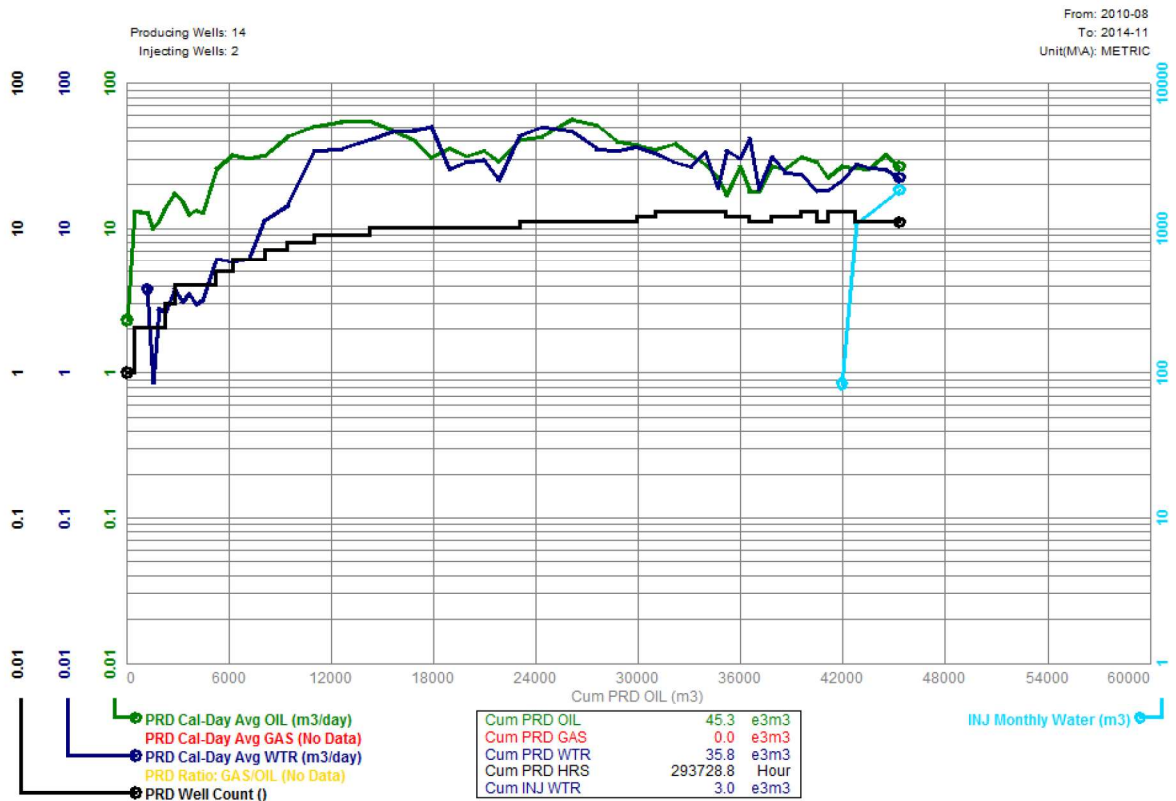
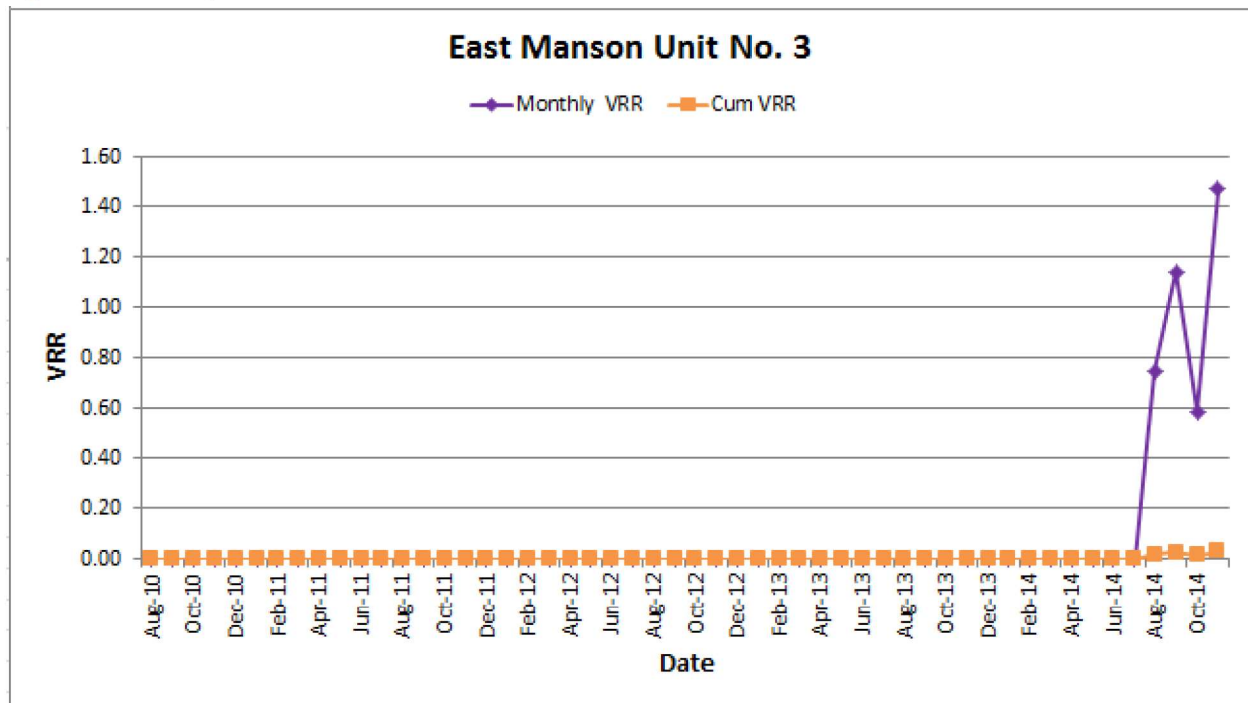


Figure 3: Injection Parameters

Month	Oil Rate (m3/d)	Gas Rate (m3/d)	Water Rate (m3/d)	Water Inj Rate (m3/d)	Water Inj Press (psi)	Cum Oil (m3)	Cum Gas (e3m3)	Cum Water (m3)	Cum Inj Water (m3)	GOR (m3/m3)	WOR (m3/m3)
Jan-14	17.9	0.0	18.5	0.0	-	37087.6	0.0	28594.7	0.0	0	1.03
Feb-14	26.8	0.0	31.2	0.0	-	37836.6	0.0	29468.3	0.0	0	1.17
Mar-14	25.6	0.0	24.3	0.0	-	38631.1	0.0	30221.4	0.0	0	0.95
Apr-14	31.2	0.0	23.4	0.0	-	39566.6	0.0	30921.9	0.0	0	0.75
May-14	28.8	0.0	18.0	0.0	-	40458.6	0.0	31480.3	0.0	0	0.63
Jun-14	22.5	0.0	18.2	0.0	-	41132.9	0.0	32025.3	0.0	0	0.81
Jul-14	26.7	0.0	21.4	0.0	-	41960.9	0.0	32687.7	0.0	0	0.80
Aug-14	26.0	0.0	27.7	34.8	0-50	42765.7	0.0	32884.0	1079.1	0	1.07
Sep-14	25.5	0.0	26.2	51.1	50-100	43530.4	0.0	32811.3	1531.9	0	1.03
Oct-14	31.9	0.0	25.4	28.5	100-200	44519.9	0.0	31708.7	882.6	0	0.80
Nov-14	26.6	0.0	22.2	61.0	200-400	45317.3	0.0	32146.0	1830.3	0	0.83

Month	Days	Monthly Oil Prod Gas (m3)	Monthly Prod H2O (m3)	Monthly Prod H2O Inj (m3/d)	Oil Prod as Prod (m3/d)	Gas Prod as Prod (m3/d)	H2O Prod as Prod (m3/d)	Cum Oil (m3)	Cum Gas (m3)	Cum H2O (m3)	Prod Well	GOR (m3/m3)	H2O Cut %	Voidage (m3/d)	Monthly Cum VRR (m3/m3)	Cum GOR H2O Cut %	Cum Void Cum (m3)	Monthly VRR
Aug-10	31	70.7	0	0	2	0	0	71	0	0	1	0	0.0%	2	0.00	0.0%	516	0.000
Sep-10	30	386.8	0	0	13	0	0	458	0	0	2	0	0.0%	9	0.00	0.0%	334.0	0.000
Oct-10	31	402.3	0	0	13	0	0	860	0	0	2	0	0.0%	9	0.00	0.0%	627.6	0.000
Nov-10	30	384.4	0	0	13	0	4	1244	0	112	2	0	22.6%	13	0.00	8.3%	1021.2	0.000
Dec-10	31	310.8	0	26.7	0	10	0	1555	0	139	2	0	7.9%	8	0.00	8.2%	1274.9	0.000
Jan-11	31	346.5	0	86.1	0	11	0	1902	0	225	2	0	19.9%	11	0.00	10.6%	1644.4	0.000
Feb-11	28	388.4	0	72.7	0	14	0	2290	0	298	3	0	16.8%	13	0.00	11.5%	1971.0	0.000
Mar-11	31	543.8	0	116.3	0	18	0	2834	0	414	4	0	17.6%	17	0.00	12.8%	2444.8	0.000
Apr-11	30	453.6	0	92.2	0	15	0	3293	0	506	4	0	16.7%	14	0.00	13.3%	2913.0	0.000
May-11	31	385.2	0	109.2	0	12	0	3679	0	616	4	0	22.1%	13	0.00	14.3%	3303.9	0.000
Jun-11	30	401.3	0	89.5	0	13	0	4080	0	705	4	0	18.2%	12	0.00	14.7%	3686.8	0.000
Jul-11	31	394.6	0	98.4	0	13	0	4474	0	804	4	0	20.0%	13	0.00	15.2%	4073.8	0.000
Aug-11	31	796.4	0	190.9	0	26	0	5273	0	994	5	0	19.3%	25	0.00	15.9%	4868.5	0.000
Sep-11	30	957.2	0	175.1	0	32	0	6230	0	1170	6	0	15.5%	29	0.00	15.8%	5723.2	0.000
Oct-11	31	933.8	0	188.9	0	30	0	7164	0	1358	6	0	16.8%	28	0.00	15.9%	6594.7	0.000
Nov-11	30	945.8	0	341.5	0	32	0	8100	0	1700	7	0	26.5%	34	0.00	17.3%	7528.3	0.000
Dec-11	31	1328.8	0	443.7	0	43	0	9438	0	2144	8	0	25.0%	46	0.00	18.5%	9044.3	0.000
Jan-12	31	1572.5	0	1057.6	0	51	0	11011	0	3201	9	0	40.2%	71	0.00	22.5%	11255.2	0.000
Feb-12	29	1576.5	0	1020.3	0	54	0	12587	0	4222	9	0	39.3%	75	0.00	25.1%	13431.5	0.000
Mar-12	31	1696.2	0	1261.1	0	55	0	14284	0	5483	10	0	42.6%	81	0.00	27.7%	15937.2	0.000
Apr-12	30	1395.0	0	1396.6	0	47	0	15679	0	6879	10	0	50.0%	81	0.00	30.5%	18393.2	0.000
May-12	31	1244.8	0	1463.7	0	40	0	16923	0	8343	10	0	54.0%	77	0.00	33.0%	20739.0	0.000
Jun-12	30	913.2	0	1503.3	0	30	0	17837	0	9846	10	0	62.2%	73	0.00	36.6%	22966.6	0.000
Jul-12	31	1104.5	0	792.7	0	36	0	18941	0	10639	10	0	41.8%	52	0.00	36.0%	24519.6	0.000
Aug-12	31	970.4	0	878.0	0	34	0	19912	0	11517	10	0	47.5%	51	0.00	36.6%	26104.4	0.000
Sep-12	30	1029.1	0	867.3	0	31	0	20941	0	12404	10	0	46.3%	55	0.00	37.2%	27753.5	0.000
Oct-12	31	893.4	0	668.7	0	29	0	21834	0	13073	10	0	42.8%	43	0.00	37.5%	29077.8	0.000
Nov-12	30	1221.7	0	1294.8	0	41	0	23056	0	14368	11	0	51.5%	73	0.00	38.4%	31271.0	0.000
Dec-12	31	1328.3	0	1552.0	0	43	0	24384	0	15920	11	0	53.9%	82	0.00	39.5%	33800.5	0.000
Jan-13	31	1747.8	0	1439.7	0	56	0	26132	0	17359	11	0	45.2%	88	0.00	39.9%	36523.4	0.000
Feb-13	28	1445.8	0	990.0	0	52	0	27578	0	18349	11	0	40.6%	73	0.00	40.0%	38573.8	0.000
Mar-13	31	1221.8	0	1052.5	0	39	0	28799	0	19402	11	0	46.3%	63	0.00	40.3%	40523.6	0.000
Apr-13	30	1123.4	0	1092.5	0	37	0	29823	0	20494	12	0	49.3%	64	0.00	40.6%	42441.7	0.000
May-13	31	1076.8	0	1020.2	0	35	0	31000	0	21515	13	0	48.7%	58	0.00	41.0%	44253.1	0.000
Jun-13	30	1144.1	0	853.4	0	38	0	32144	0	22368	13	0	42.7%	56	0.00	41.0%	45946.0	0.000
Jul-13	31	981.5	0	821.3	0	32	0	33125	0	23189	13	0	45.6%	50	0.00	41.2%	47488.0	0.000
Aug-13	31	850.3	0	1029.2	0	27	0	33976	0	24219	13	0	54.8%	53	0.00	41.6%	49131.1	0.000
Sep-13	30	673.2	0	564.4	0	22	0	34649	0	24783	13	0	45.6%	35	0.00	41.7%	50201.8	0.000
Oct-13	31	526.7	0	1063.2	0	17	0	35175	0	25846	12	0	66.9%	47	0.00	42.4%	51654.9	0.000
Nov-13	30	796.6	0	904.9	0	27	0	35972	0	26751	12	0	53.2%	50	0.00	42.6%	53454.9	0.000
Dec-13	31	560.2	0	1271.3	0	18	0	36532	0	28022	11	0	69.4%	54	0.00	43.4%	54632.7	0.000
Jan-14	31	555.4	0	572.4	0	18	0	37088	0	28595	11	0	50.8%	32	0.00	43.5%	55813.4	0.000
Feb-14	28	743.0	0	873.6	0	27	0	37837	0	29468	12	0	53.8%	51	0.00	43.8%	57282.2	0.000
Mar-14	31	794.5	0	753.1	0	26	0	38631	0	30221	12	0	48.7%	43	0.00	43.9%	58675.1	0.000
Apr-14	30	935.5	0	700.5	0	31	0	39567	0	30922	13	0	42.8%	46	0.00	43.9%	59832.1	0.000
May-14	31	892.0	0	558.4	0	29	0	40459	0	31480	11	0	38.5%	39	0.00	43.8%	61714.4	0.000
Jun-14	30	674.3	0	545.0	0	22	0	41133	0	32025	13	0	44.7%	35	0.00	43.8%	62214.4	0.000
Jul-14	31	828.0	0	662.4	0	27	0	41861	0	32688	13	0	44.4%	41	0.00	43.8%	63444.6	0.000
Aug-14	31	804.8	0	858.7	0	26	0	42766	0	32884	11	0	51.6%	47	0.75	43.5%	64263.4	0.017
Sep-14	30	764.7	0	786.0	0	25	0	43530	0	32811	11	0	50.7%	45	1.14	43.0%	64754.6	0.024
Oct-14	31	989.5	0	786.8	0	32	0	44520	0	3709	11	0	44.3%	49	0.59	41.6%	64386.6	0.014
Nov-14	30	737.4	0	665.7	0	27	0	45317	0	32146	11	0	45.5%	42	1.47	41.5%	65303.3	0.028

Figure 4: Monthly and Cum VRR vs Time for EMU #3



Discussion

In July / August 2014, Surge converted 2 wells to injection (100/15-20 and 100/08-21). Injection commenced in August.

We have seen early waterflood response on 3 to 4 producers in EMU #3... refer to Figures 5 to 8.

Figure 5: Rate vs Time for 102/15-20 Producer (response from 100/15-20 injector)

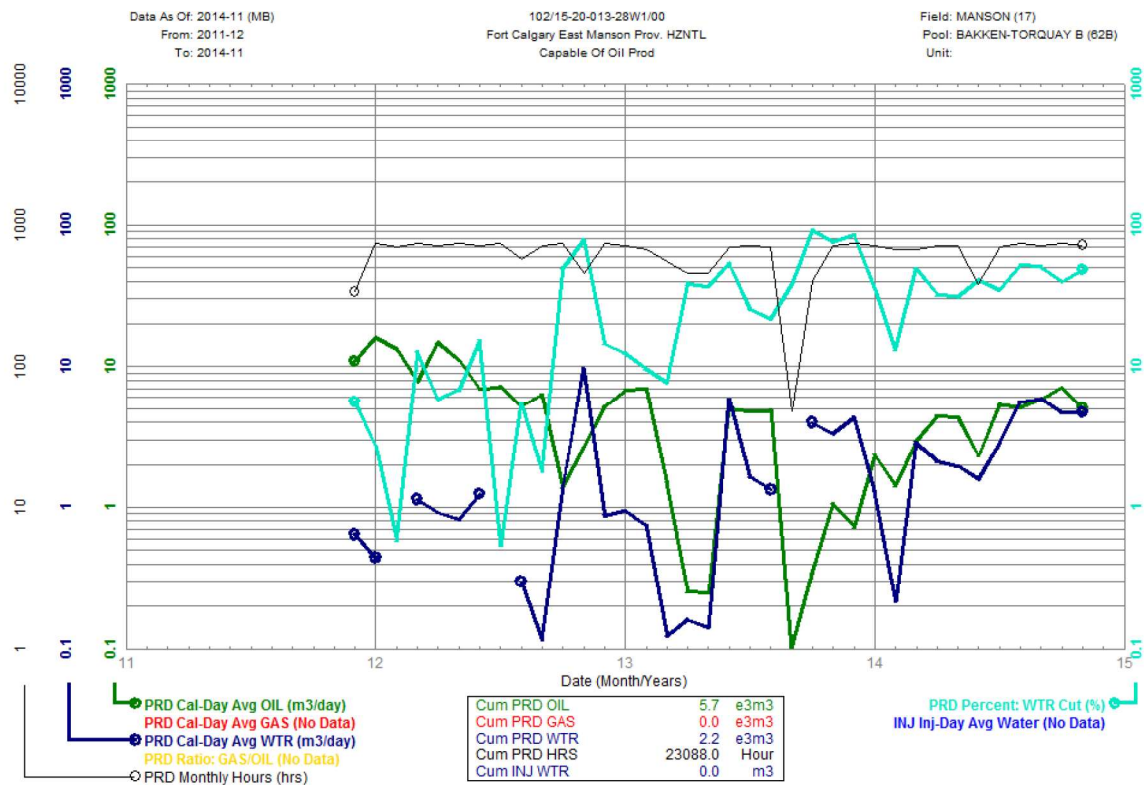


Figure 6: Rate vs Time for 100/01-21 Producer (response from 100/08-21 injector)

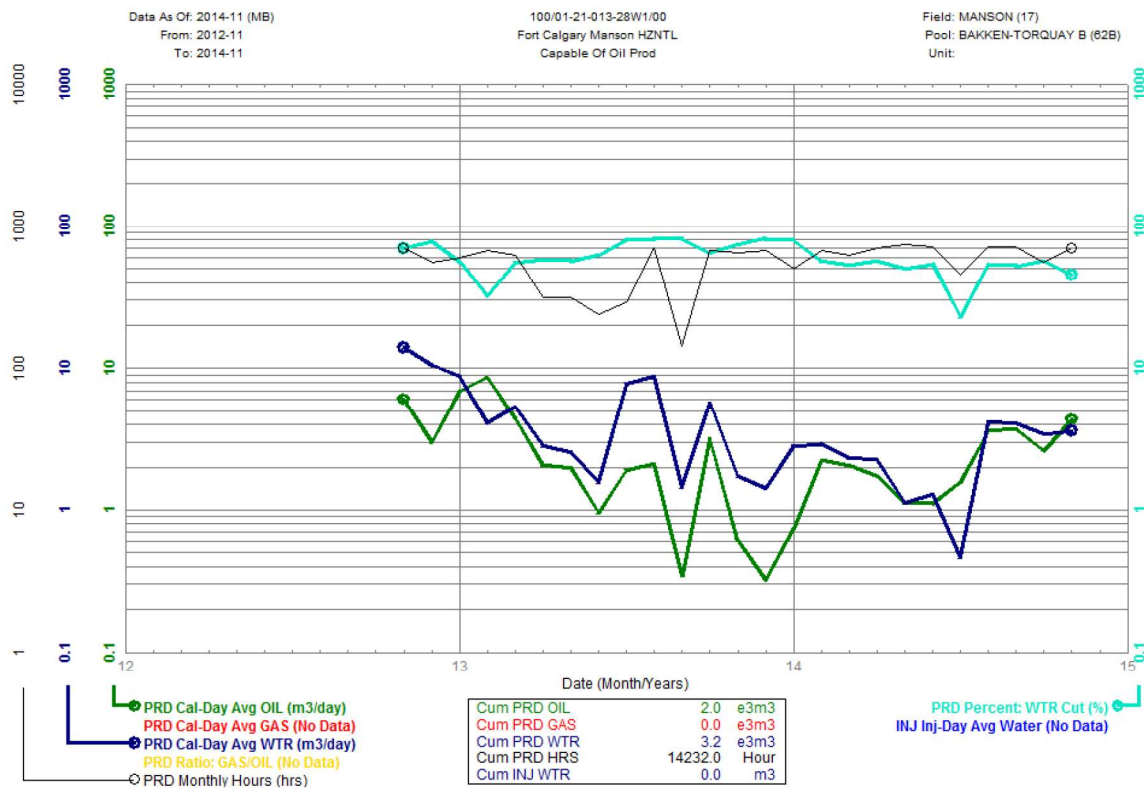


Figure 7: Rate vs Time for 100/07-21 Producer (response from 100/08-21 injector)

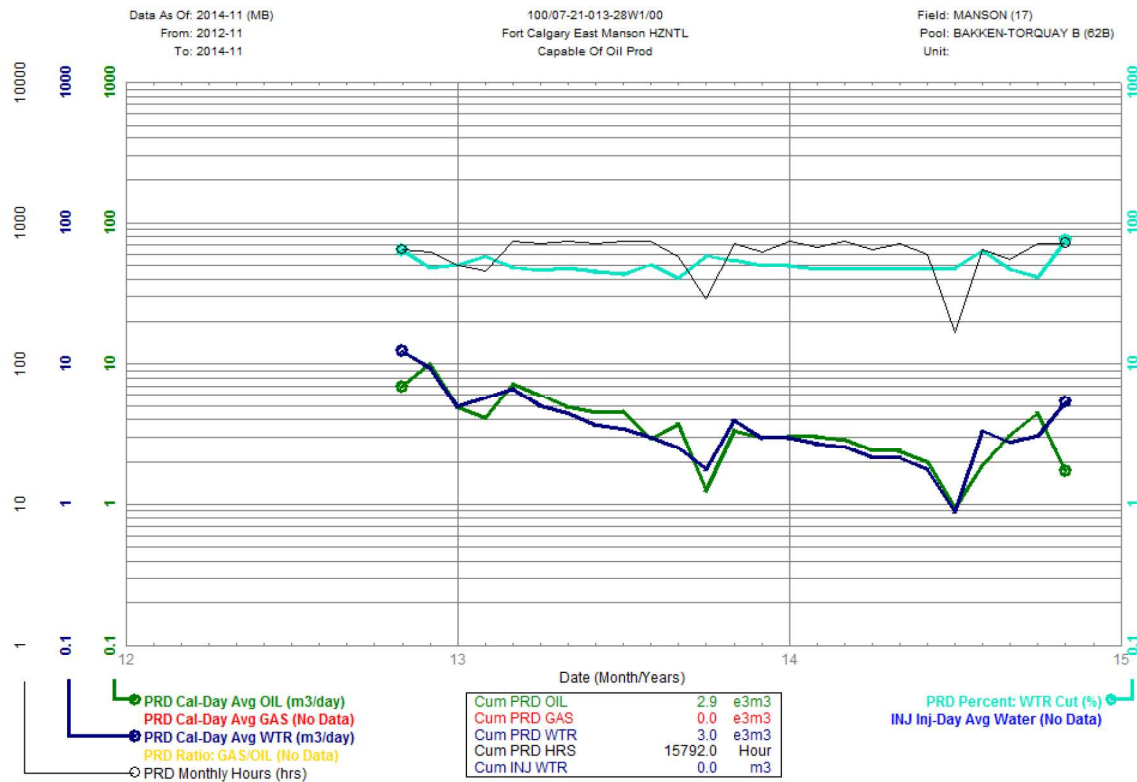


Figure 8: Rate vs Time for 100/10-21 Producer (potential response from 100/08-21 injector)

