

**BIRDTAIL UNIT NO. 1**  
**WATERFLOOD EOR PROJECT**  
  
**ANNUAL REPORT FOR 2010**

**July 27, 2011**

**Tundra Oil and Gas Partnership**

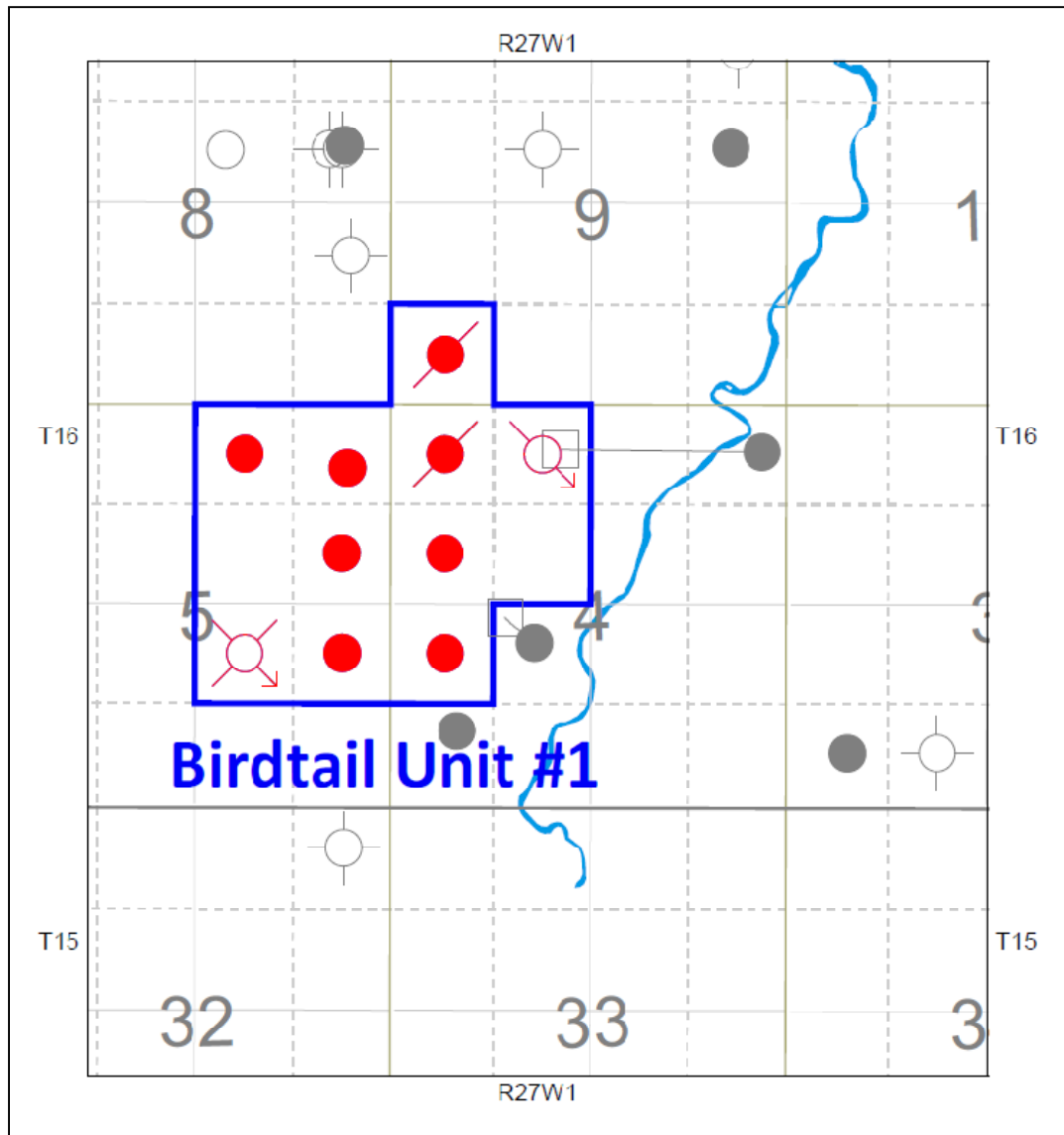
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## **INTRODUCTION**

Birdtail Unit No. 1 Enhanced Oil Recovery (EOR) Waterflood Project was approved under Water flood Order No. 7 effective August 1, 1999 with Progress Energy Production Partnership as Operator. Tundra acquired the unit from Progress Energy Production Partnership and become operator in October 2003. The EOR project area contains 10 wells in 12 LSDs in Township 16, Range 27 W1 as shown in the figure below. Well list and well status is available in Appendix A.

**Figure 1: Birdtail Unit No. 1 Area Outline**



In accordance with Section 73 of the Manitoba Drilling and Production Regulation, Tundra hereby submits the 2010 Annual Progress Report for Birdtail Unit No. 1 as required by Waterflood Order No. 7.

## DISCUSSION

### Production History

For the wells included in Birdtail Unit No. 1, production started September 1996 with the 00/16-05-016-27W1/0 well. Oil production peaked at 17.9 m<sup>3</sup>/d in October 1997. The water oil ratio (WOR) averaged 2.45 m<sup>3</sup>/m<sup>3</sup> over the last half of 2010. The Unit was producing 3.48 m<sup>3</sup>/d of oil and 8.22 m<sup>3</sup>/d of water in December 2010. The oil production rate, injection rate, and WOR during each month for each injection pattern and for whole project are presented in Appendix D. The rates and WOR are presented in Figure 2.

**Figure 2: Birdtail Unit No. 1 Production/Injection Rates and WOR vs. Time**

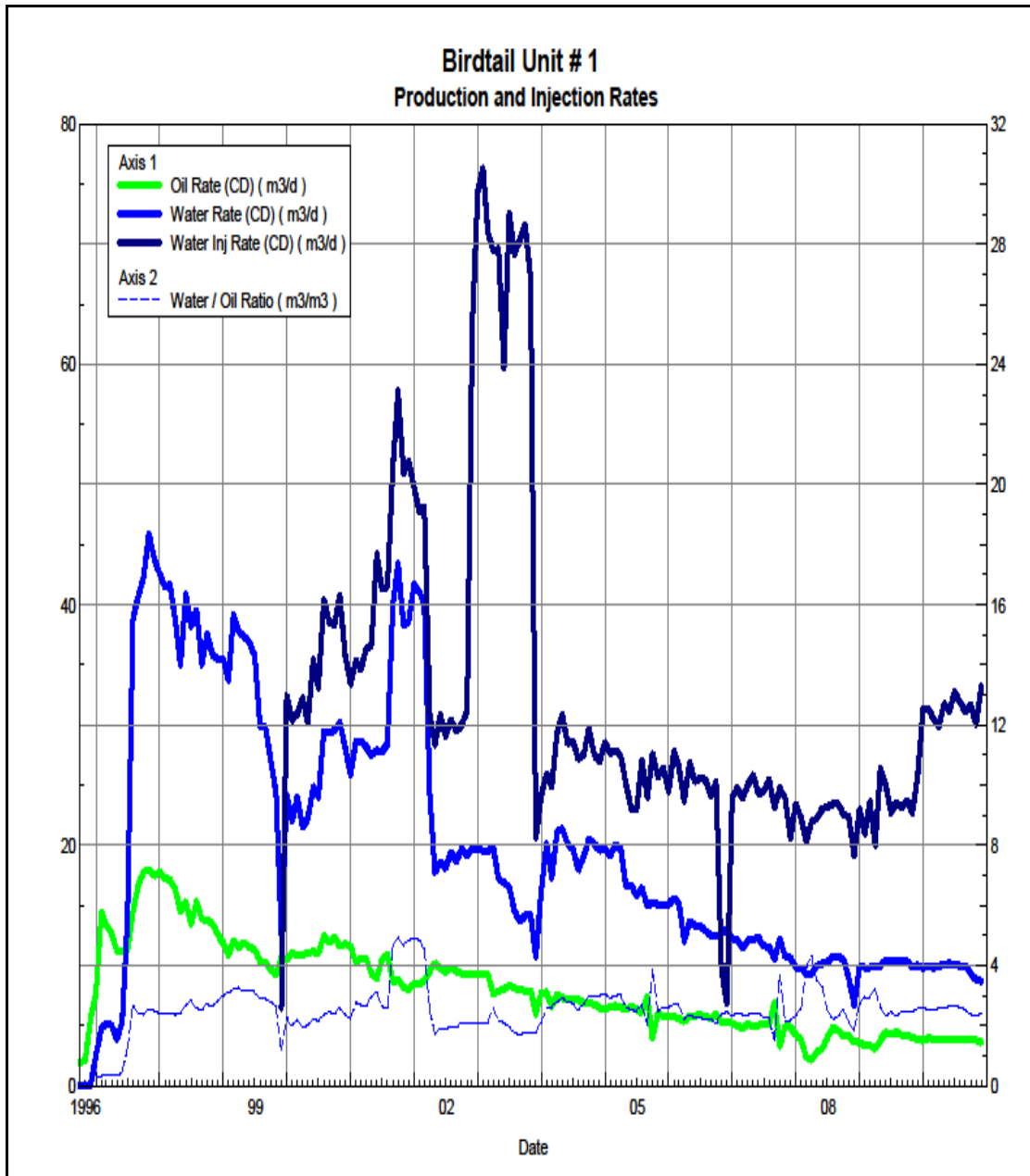
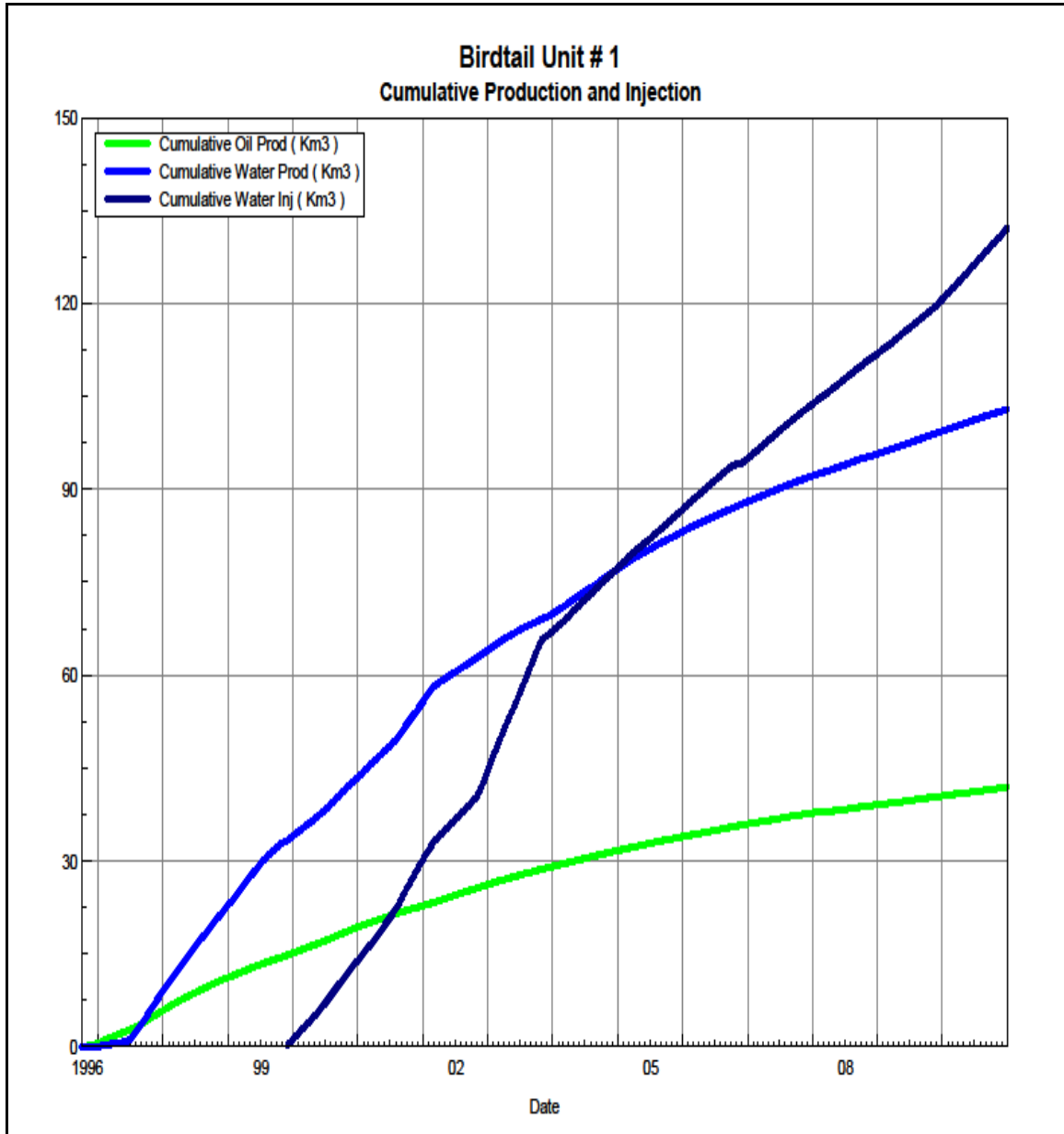


Figure 3 shows the cumulative production for Birdtail Unit No. 1 to the end of December 2010 as 41.9 E<sup>3</sup>m<sup>3</sup> of oil, and 102.9 E<sup>3</sup>m<sup>3</sup> of water. The cumulative water injected is 132.3 E<sup>3</sup>m<sup>3</sup>. The cumulative volume of oil, and water produced and fluid injected for each injection pattern and for the whole project for each injection well is presented in Appendix D.

**Figure 3: Birdtail Unit No. 1 Cumulative Oil, Water and Water Injected vs. Time**



### Waterflood History

As of December 2010 the Unit has 1 active vertical injector. At year end 2010, Birdtail Unit No.1 waterflood had 1 injector pattern in place. Water injection started in November 1999 in the two injector's 00/14-04-016-27W1 and 00/07-05-016-27W1. The 00/07-05-

016-27W1 injector has been abandoned since July 2003, and water has only been injected through 00/14-04-016-27W1.

Any future revisions to the waterflood development or surveillance plan would be based on new production or performance response data, technical studies, or observed reservoir behavior and reserves recovery interpretations.

## **Waterflood EOR Operations**

### **Water Source and Quality**

Injected fluid consists of water produced from the Lodgepole formation, from the unit and surrounding area. Water is filtered to 25 microns prior to re-injection.

### **Injection Wellhead Pressures**

The monthly wellhead injection pressure for the injection well is summarized in Appendix B, and shows all injection pressure since 2003. Average Injection pressure for injector 00/14-04-016-27W1/0 was 6767 kPag in 2010. Injection pressure for 00/14-04-16-27W1/0 has been consistent since 2003, averaging 6800 kPag.

### **Reservoir Pressure**

No reservoir pressure measurements were taken at Birdtail Unit No. 1 in 2010.

### **Well Servicing**

No maintenance was required on the 10 wells in Birdtail Unit No. 1, in 2010.

### **Voidage Replacement**

Cumulative voidage for the Birdtail Unit No. 1 was 1.15 in December 2010. As of 2000, monthly voidage is significantly greater than 1, and Birdtail Unit No. 1 has exceeded a cumulative VRR of 1. Calculation, plots and tables of the Voidage replacement ratio on a monthly and cumulative basis for each injection pattern and for the project area are presented in Appendix D.

### **Waterflood Performance Discussion**

The original oil-in-place (OOIP) is estimated based on 3.5 m pay, 15% porosity, 45% water saturation, formation volume factor of 1.003, and a 192 ha area. The resulting OOIP is 572,400 m<sup>3</sup>. The cumulative oil recovered to date is 41,900 m<sup>3</sup> or a recovery factor of 7.3%. The ultimate expected recoverable reserve based on decline analysis is 52,500 m<sup>3</sup> or an ultimate recovery factor of 9.2%.

The overall performance of this waterflood has been poor as indicated by the low recovery factor, and obvious lack of waterflood response in producers. This is likely due to the poorer than average reservoir quality of the injector wells, the location of the injectors, and the resulting poor areal sweep efficiency.

Trends in production since 2010 have shallowed slightly since 2010 when injected water was increased. Despite the slightly flattened oil decline trends, no significant change in production trends for produced water or oil is expected until waterflood optimization operations are undertaken, possibly at the same time as facility enhancements to increase total fluid throughput.

## **List of Appendices**

Appendix A: Well Name and Well Status

Appendix B: Monthly Injection Wellhead Pressures Table and Plots

Appendix C: Birdtail Unit No. 1 Injection Pattern Summary

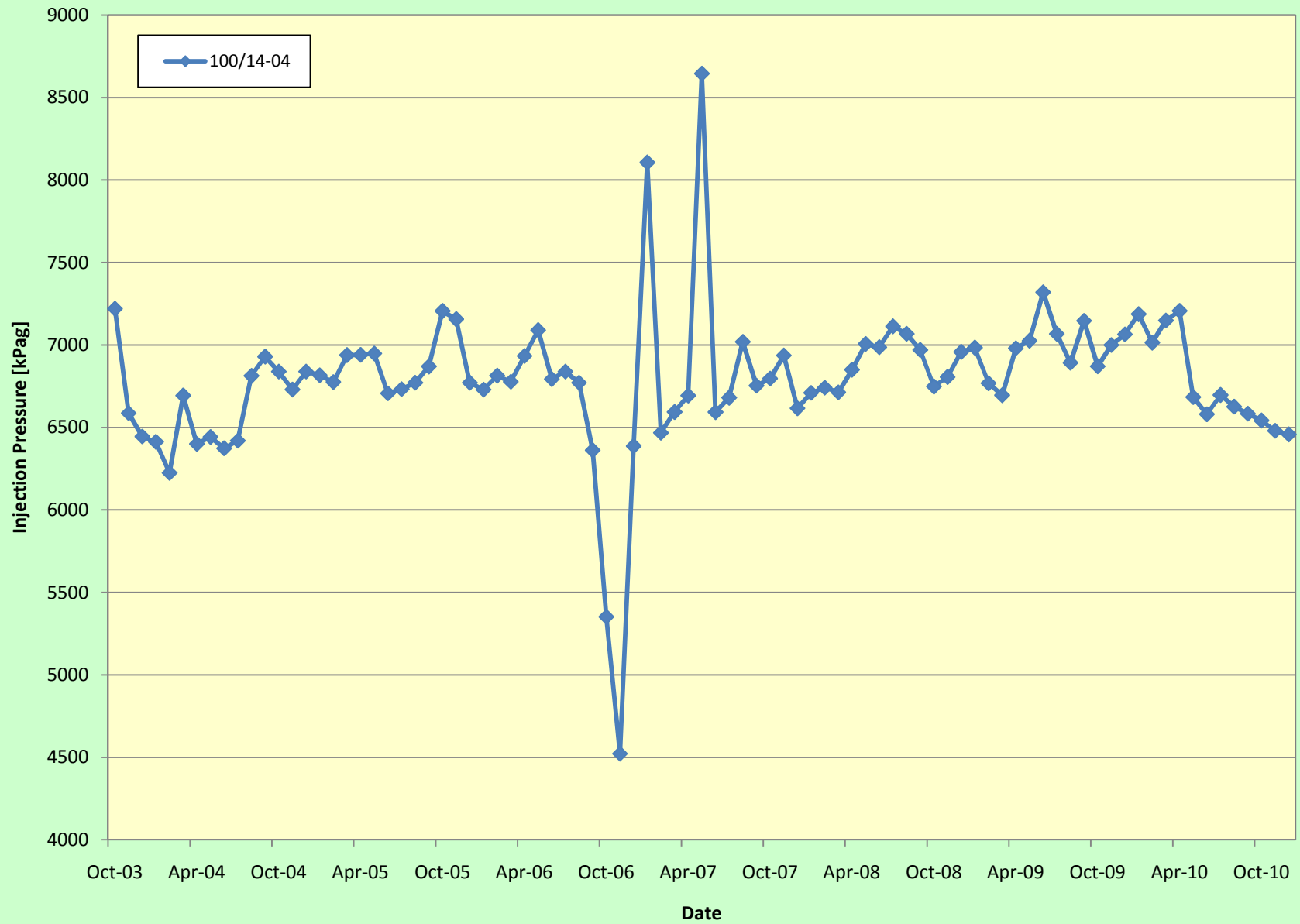
Appendix D: Injector Pattern Production/Injection Rates, Cumulative and VRRs  
Plots and Tables for the following injectors:

00/14-04-016-27W1/0

## Appendix A

UWI	Well Status
100/05-04-016-27W1/00	Capable of OIL Prod
100/12-04-016-27W1/00	Capable of OIL Prod
100/13-04-016-27W1/00	ABD Producer
100/14-04-016-27W1/00	WTR Injection
100/07-05-016-27W1/00	ABD WTR Injection
100/08-05-016-27W1/00	Capable of OIL Prod
100/09-05-016-27W1/00	Capable of OIL Prod
100/15-05-016-27W1/00	Capable of OIL Prod
100/16-05-016-27W1/00	Capable of OIL Prod
100/04-09-016-27W1/00	ABD Producer

# 100/14-04 Injection Pressures vs Time



## Appendix B

### Average Monthly Injection Pressure (kPag)

	Pattern
Month	100/14-04
Oct-03	7220
Nov-03	6587
Dec-03	6445
Jan-04	6413
Feb-04	6224
Mar-04	6694
Apr-04	6400
May-04	6442
Jun-04	6373
Jul-04	6419
Aug-04	6813
Sep-04	6930
Oct-04	6839
Nov-04	6730
Dec-04	6839
Jan-05	6816
Feb-05	6775
Mar-05	6939
Apr-05	6940
May-05	6948
Jun-05	6707
Jul-05	6732
Aug-05	6771
Sep-05	6870
Oct-05	7206
Nov-05	7157
Dec-05	6771
Jan-06	6729
Feb-06	6814
Mar-06	6777
Apr-06	6933
May-06	7090
Jun-06	6793
Jul-06	6839
Aug-06	6771
Sep-06	6362
Oct-06	5352
Nov-06	4522
Dec-06	6387
Jan-07	8106
Feb-07	6468

## Appendix B

### Average Monthly Injection Pressure (kPag)

	Pattern
Month	100/14-04
Mar-07	6594
Apr-07	6693
May-07	8645
Jun-07	6593
Jul-07	6681
Aug-07	7019
Sep-07	6753
Oct-07	6797
Nov-07	6937
Dec-07	6616
Jan-08	6710
Feb-08	6741
Mar-08	6713
Apr-08	6850
May-08	7006
Jun-08	6987
Jul-08	7113
Aug-08	7068
Sep-08	6970
Oct-08	6748
Nov-08	6807
Dec-08	6958
Jan-09	6984
Feb-09	6768
Mar-09	6695
Apr-09	6980
May-09	7026
Jun-09	7320
Jul-09	7068
Aug-09	6892
Sep-09	7147
Oct-09	6871
Nov-09	7000
Dec-09	7065
Jan-10	7187
Feb-10	7014
Mar-10	7148
Apr-10	7207
May-10	6684
Jun-10	6580
Jul-10	6697
Aug-10	6626

## Appendix B

### Average Monthly Injection Pressure (kPag)

	Pattern
Month	100/14-04
Sep-10	6583
Oct-10	6542
Nov-10	6480
Dec-10	6458

Pattern Name	Injector Location (016-27W1)	Status	Supported Wells (016-27W1)	No. of Supported Wells	Allocation Factor	Pattern Prod Start Month	Inj Start Month	Oil Rate (m³/d)	Water Rate (m³/d)	WOR (m³/m³)	Water Injection (m³/d)	Cum Oil (E³m³)	Cum Water (E³m³)	Cum Inj Water (E³m³)	Monthly VRR	Cum VRR
00/14-04-016-27W1 Injector	00/14-04	WTR Injection	04-09, 05-04, 07-05, 08-05, 09-05, 12-04, 13-04, 15-05, 16-05	9	1	Oct 1996	Nov 1999	3.5	8.2	2.36	32.8	41.9	102.9	132.2	3.5	1.15

# Pattern: 14-04-016-27 Set: Birdtail Unit # 1

Oil Formation Vol. Factor : 1 m3/m3

Water Formation Vol Factor : 1.00000 m3/m3

Water / Oil Ratio : 2.32 m3/m3

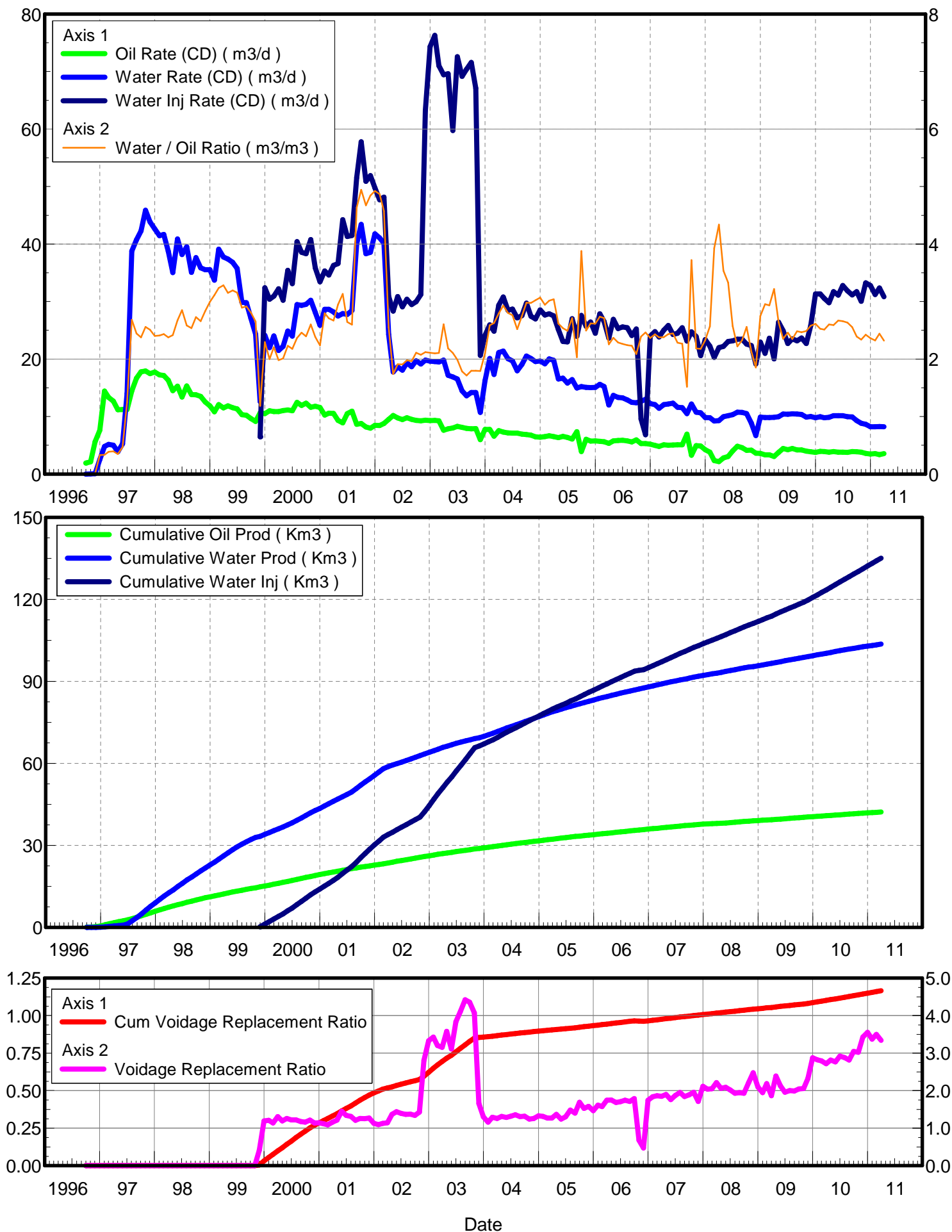
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Operator: TUNDRA\_OIL\_&\_GAS\_LIMITED

Oil Rate (CD) : 3.54 m3/d

Water Rate (CD) : 8.21 m3/d

Water Inj Rate (CD) : 30.84 m3/d



Date	Oil Rate (CD) m3/d	Water Rate (CD) m3/d	Water Oil Ratio m3/m3	Water Inj Rate (CD) m3/d	Cum Oil Prod Km3	Cum Water Prod Km3	Cum Water Inj Km3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
9/30/1996	1.93	0.00	0.00		0.06	0.00	0.00	0.000	0.000
10/31/1996	2.13	0.02	0.01		0.12	0.00	0.00	0.000	0.000
11/30/1996	5.62	0.05	0.01		0.29	0.00	0.00	0.000	0.000
12/31/1996	7.62	2.52	0.33		0.53	0.08	0.00	0.000	0.000
1/31/1997	14.41	4.81	0.33		0.98	0.23	0.00	0.000	0.000
2/28/1997	13.33	5.15	0.39		1.35	0.37	0.00	0.000	0.000
3/31/1997	12.68	5.02	0.40		1.74	0.53	0.00	0.000	0.000
4/30/1997	11.16	3.87	0.35		2.08	0.65	0.00	0.000	0.000
5/31/1997	11.23	5.27	0.47		2.42	0.81	0.00	0.000	0.000
6/30/1997	11.22	14.00	1.25		2.76	1.23	0.00	0.000	0.000
7/31/1997	14.45	38.78	2.68		3.21	2.43	0.00	0.000	0.000
8/31/1997	16.66	40.72	2.44		3.73	3.69	0.00	0.000	0.000
9/30/1997	17.78	42.27	2.38		4.26	4.96	0.00	0.000	0.000
10/31/1997	17.94	45.89	2.56		4.81	6.38	0.00	0.000	0.000
11/30/1997	17.47	43.83	2.51		5.34	7.70	0.00	0.000	0.000
12/31/1997	17.75	42.61	2.40		5.89	9.02	0.00	0.000	0.000
1/31/1998	17.23	41.47	2.41		6.42	10.31	0.00	0.000	0.000
2/28/1998	17.13	41.68	2.43		6.90	11.47	0.00	0.000	0.000
3/31/1998	16.31	38.74	2.38		7.41	12.67	0.00	0.000	0.000
4/30/1998	14.49	35.03	2.42		7.84	13.72	0.00	0.000	0.000
5/31/1998	15.29	40.89	2.67		8.32	14.99	0.00	0.000	0.000
6/30/1998	13.40	38.19	2.85		8.72	16.14	0.00	0.000	0.000
7/31/1998	15.30	39.53	2.58		9.19	17.36	0.00	0.000	0.000
8/31/1998	13.82	35.05	2.54		9.62	18.45	0.00	0.000	0.000
9/30/1998	13.79	37.63	2.73		10.04	19.58	0.00	0.000	0.000
10/31/1998	13.48	35.84	2.66		10.45	20.69	0.00	0.000	0.000
11/30/1998	12.54	35.52	2.83		10.83	21.76	0.00	0.000	0.000
12/31/1998	11.87	35.54	2.99		11.20	22.86	0.00	0.000	0.000
1/31/1999	10.84	33.72	3.11		11.53	23.90	0.00	0.000	0.000
2/28/1999	12.09	39.11	3.24		11.87	25.00	0.00	0.000	0.000
3/31/1999	11.50	37.76	3.28		12.23	26.17	0.00	0.000	0.000
4/30/1999	11.87	37.39	3.15		12.59	27.29	0.00	0.000	0.000
5/31/1999	11.53	36.82	3.19		12.94	28.43	0.00	0.000	0.000
6/30/1999	11.34	35.76	3.15		13.28	29.50	0.00	0.000	0.000
7/31/1999	10.32	29.85	2.89		13.60	30.43	0.00	0.000	0.000
8/31/1999	10.22	29.81	2.92		13.92	31.35	0.00	0.000	0.000
9/30/1999	9.64	27.08	2.81		14.21	32.17	0.00	0.000	0.000
10/31/1999	9.16	24.30	2.65		14.49	32.92	0.00	0.000	0.000
11/30/1999	10.65	12.62	1.18	6.47	14.81	33.30	0.19	0.412	0.005
12/31/1999	10.52	24.12	2.29	32.40	15.14	34.04	1.20	1.193	0.031
1/31/2000	11.00	21.99	2.00	30.39	15.48	34.73	2.14	1.207	0.055
2/29/2000	10.88	24.00	2.21	30.92	15.79	35.42	3.04	1.139	0.076
3/31/2000	10.85	21.49	1.98	32.23	16.13	36.09	4.04	1.309	0.099
4/30/2000	11.04	22.18	2.01	30.23	16.46	36.75	4.94	1.191	0.119
5/31/2000	11.14	24.86	2.23	35.41	16.81	37.52	6.04	1.261	0.143
6/30/2000	11.00	23.97	2.18	33.10	17.14	38.24	7.03	1.219	0.163
7/31/2000	12.45	29.48	2.37	40.41	17.52	39.16	8.29	1.221	0.187
8/31/2000	11.93	29.32	2.46	38.55	17.89	40.07	9.48	1.176	0.210

Date	Oil Rate (CD) m3/d	Water Rate (CD) m3/d	Water Oil Ratio m3/m3	Water Inj Rate (CD) m3/d	Cum Oil Prod Km3	Cum Water Prod Km3	Cum Water Inj Km3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
9/30/2000	12.32	29.52	2.40	38.31	18.26	40.95	10.63	1.158	0.230
10/31/2000	11.62	30.21	2.60	40.76	18.62	41.89	11.89	1.214	0.252
11/30/2000	11.80	28.13	2.38	35.84	18.98	42.73	12.97	1.136	0.269
12/31/2000	11.57	25.87	2.24	33.44	19.34	43.53	14.01	1.144	0.285
1/31/2001	10.24	28.65	2.80	35.34	19.65	44.42	15.10	1.118	0.301
2/28/2001	10.58	28.64	2.71	34.59	19.95	45.22	16.07	1.091	0.315
3/31/2001	10.55	28.19	2.67	36.29	20.28	46.10	17.20	1.162	0.331
4/30/2001	9.32	27.48	2.95	36.61	20.56	46.92	18.29	1.213	0.346
5/31/2001	8.91	27.90	3.13	44.24	20.83	47.79	19.66	1.452	0.365
6/30/2001	10.49	27.74	2.64	41.31	21.15	48.62	20.90	1.342	0.382
7/31/2001	10.94	28.42	2.60	41.47	21.49	49.50	22.19	1.313	0.398
8/31/2001	8.64	40.02	4.63	51.53	21.75	50.74	23.79	1.212	0.417
9/30/2001	8.78	43.43	4.94	57.77	22.02	52.05	25.52	1.257	0.437
10/31/2001	8.19	38.30	4.67	50.91	22.27	53.23	27.10	1.252	0.454
11/30/2001	7.96	38.56	4.84	51.90	22.51	54.39	28.66	1.270	0.471
12/31/2001	8.48	41.76	4.92	49.75	22.77	55.68	30.20	1.125	0.485
1/31/2002	8.43	41.05	4.87	47.69	23.04	56.96	31.68	1.097	0.498
2/28/2002	8.78	40.14	4.57	48.14	23.28	58.08	33.02	1.128	0.510
3/31/2002	9.51	24.27	2.55	30.89	23.58	58.83	33.98	1.143	0.518
4/30/2002	10.20	17.74	1.74	28.34	23.88	59.37	34.83	1.370	0.526
5/31/2002	9.75	18.64	1.91	30.86	24.18	59.94	35.79	1.438	0.535
6/30/2002	9.47	18.07	1.91	29.08	24.47	60.48	36.66	1.398	0.543
7/31/2002	9.78	19.36	1.98	30.41	24.77	61.09	37.60	1.370	0.551
8/31/2002	9.51	18.66	1.96	29.46	25.07	61.66	38.52	1.376	0.559
9/30/2002	9.33	19.70	2.11	29.99	25.35	62.25	39.42	1.339	0.566
10/31/2002	9.24	19.15	2.07	31.21	25.63	62.85	40.38	1.430	0.575
11/30/2002	9.35	19.82	2.12	63.23	25.91	63.44	42.28	2.807	0.596
12/31/2002	9.30	19.62	2.11	74.32	26.20	64.05	44.59	3.332	0.622
1/31/2003	9.32	19.56	2.10	76.29	26.49	64.66	46.95	3.428	0.649
2/28/2003	9.25	19.48	2.11	71.01	26.75	65.20	48.94	3.205	0.671
3/31/2003	7.61	19.81	2.60	69.43	26.99	65.82	51.09	3.154	0.694
4/30/2003	7.86	17.18	2.18	69.62	27.22	66.33	53.18	3.578	0.717
5/31/2003	8.02	16.87	2.10	59.74	27.47	66.86	55.03	3.113	0.736
6/30/2003	8.30	16.51	1.99	72.57	27.72	67.35	57.21	3.837	0.759
7/31/2003	8.11	14.48	1.79	69.16	27.97	67.80	59.35	4.111	0.782
8/31/2003	7.95	13.61	1.71	70.40	28.22	68.22	61.53	4.425	0.806
9/30/2003	7.88	14.16	1.80	71.59	28.45	68.65	63.68	4.355	0.828
10/31/2003	7.91	14.19	1.79	67.08	28.70	69.09	65.76	4.070	0.850
11/30/2003	5.97	10.70	1.79	20.62	28.88	69.41	66.38	1.659	0.854
12/31/2003	7.74	16.26	2.10	24.14	29.12	69.91	67.13	1.305	0.857
1/31/2004	7.76	20.08	2.59	25.94	29.36	70.53	67.93	1.162	0.860
2/29/2004	6.58	17.30	2.63	24.84	29.55	71.04	68.65	1.294	0.863
3/31/2004	7.55	21.11	2.79	29.35	29.78	71.69	69.56	1.260	0.866
4/30/2004	7.30	21.37	2.93	30.81	30.00	72.33	70.49	1.312	0.870
5/31/2004	7.16	20.05	2.80	28.47	30.22	72.95	71.37	1.287	0.874
6/30/2004	7.12	19.65	2.76	28.68	30.44	73.54	72.23	1.321	0.877
7/31/2004	7.13	17.96	2.52	27.15	30.66	74.10	73.07	1.356	0.881
8/31/2004	6.94	19.06	2.75	27.54	30.87	74.69	73.93	1.307	0.884

Date	Oil Rate (CD) m3/d	Water Rate (CD) m3/d	Water Oil Ratio m3/m3	Water Inj Rate (CD) m3/d	Cum Oil Prod Km3	Cum Water Prod Km3	Cum Water Inj Km3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
9/30/2004	6.88	20.51	2.98	29.73	31.08	75.31	74.82	1.321	0.888
10/31/2004	6.76	20.10	2.97	27.44	31.29	75.93	75.67	1.244	0.890
11/30/2004	6.47	19.55	3.02	26.98	31.48	76.52	76.48	1.259	0.893
12/31/2004	6.41	19.66	3.07	28.55	31.68	77.12	77.36	1.327	0.897
1/31/2005	6.51	19.15	2.94	27.64	31.88	77.72	78.22	1.314	0.900
2/28/2005	6.64	20.01	3.01	27.88	32.07	78.28	79.00	1.271	0.902
3/31/2005	6.50	19.78	3.04	27.50	32.27	78.89	79.85	1.270	0.905
4/30/2005	6.33	16.54	2.61	25.11	32.46	79.39	80.61	1.367	0.908
5/31/2005	6.56	16.65	2.54	23.05	32.66	79.90	81.32	1.242	0.910
6/30/2005	6.35	15.82	2.49	22.97	32.86	80.38	82.01	1.301	0.912
7/31/2005	6.06	16.44	2.71	27.01	33.04	80.89	82.85	1.485	0.916
8/31/2005	7.37	14.96	2.03	23.96	33.27	81.35	83.59	1.402	0.919
9/30/2005	3.92	15.20	3.88	27.59	33.39	81.81	84.42	1.690	0.923
10/31/2005	6.04	15.08	2.50	25.68	33.58	82.28	85.21	1.526	0.926
11/30/2005	5.74	15.03	2.62	26.44	33.75	82.73	86.01	1.584	0.930
12/31/2005	5.76	15.05	2.61	24.49	33.93	83.19	86.77	1.465	0.933
1/31/2006	5.71	15.61	2.74	27.85	34.10	83.68	87.63	1.614	0.937
2/28/2006	5.60	15.20	2.71	26.50	34.26	84.10	88.37	1.575	0.940
3/31/2006	5.32	12.00	2.26	23.63	34.43	84.47	89.10	1.745	0.944
4/30/2006	5.78	13.68	2.37	26.91	34.60	84.89	89.91	1.753	0.948
5/31/2006	5.82	13.32	2.29	25.29	34.78	85.30	90.69	1.685	0.951
6/30/2006	5.87	13.27	2.26	25.57	34.96	85.70	91.46	1.709	0.955
7/31/2006	5.75	12.89	2.24	25.43	35.13	86.10	92.25	1.747	0.958
8/31/2006	5.58	12.46	2.23	24.10	35.31	86.48	93.00	1.711	0.962
9/30/2006	5.94	12.40	2.09	25.23	35.49	86.85	93.75	1.787	0.965
10/31/2006	5.29	12.64	2.39	9.59	35.65	87.25	94.05	0.677	0.964
11/30/2006	5.28	13.00	2.46	6.84	35.81	87.64	94.26	0.471	0.962
12/31/2006	5.18	12.26	2.36	23.99	35.97	88.02	95.00	1.744	0.965
1/31/2007	4.96	12.06	2.43	24.78	36.12	88.39	95.77	1.836	0.969
2/28/2007	4.80	11.41	2.38	23.85	36.26	88.71	96.44	1.863	0.972
3/31/2007	5.07	12.07	2.38	25.02	36.41	89.08	97.21	1.849	0.976
4/30/2007	5.00	12.16	2.43	25.83	36.56	89.45	97.99	1.898	0.980
5/31/2007	5.04	12.32	2.45	24.28	36.72	89.83	98.74	1.762	0.983
6/30/2007	5.08	11.60	2.28	24.48	36.87	90.18	99.47	1.872	0.986
7/31/2007	5.10	11.55	2.27	25.45	37.03	90.54	100.26	1.953	0.990
8/31/2007	6.94	10.52	1.52	23.11	37.25	90.86	100.98	1.845	0.994
9/30/2007	3.27	12.16	3.72	24.73	37.34	91.23	101.72	1.887	0.997
10/31/2007	4.93	10.77	2.19	23.90	37.50	91.56	102.46	1.960	1.001
11/30/2007	4.88	10.64	2.18	20.60	37.64	91.88	103.08	1.710	1.003
12/31/2007	4.23	9.83	2.33	23.39	37.77	92.19	103.81	2.117	1.007
1/31/2008	3.81	9.78	2.57	22.22	37.89	92.49	104.49	2.041	1.010
2/29/2008	2.34	9.21	3.93	20.27	37.96	92.76	105.08	2.049	1.013
3/31/2008	2.15	9.30	4.34	21.97	38.03	93.04	105.76	2.214	1.017
4/30/2008	2.82	9.96	3.54	22.21	38.11	93.34	106.43	2.061	1.020
5/31/2008	3.05	10.16	3.33	23.04	38.21	93.66	107.14	2.087	1.023
6/30/2008	4.01	10.31	2.57	23.16	38.33	93.97	107.84	2.020	1.027
7/31/2008	4.85	10.75	2.22	23.43	38.48	94.30	108.57	1.929	1.030
8/31/2008	4.60	10.70	2.33	23.44	38.62	94.63	109.29	1.948	1.033

Date	Oil Rate (CD) m3/d	Water Rate (CD) m3/d	Water Oil Ratio m3/m3	Water Inj Rate (CD) m3/d	Cum Oil Prod Km3	Cum Water Prod Km3	Cum Water Inj Km3	Voidage Replacement Ratio	Cum Voidage Replacement Ratio
9/30/2008	4.11	10.51	2.56	22.58	38.74	94.95	109.97	1.929	1.036
10/31/2008	4.15	8.87	2.14	22.33	38.87	95.22	110.66	2.216	1.039
11/30/2008	3.61	6.68	1.85	19.13	38.98	95.42	111.24	2.476	1.043
12/31/2008	3.60	9.89	2.75	22.96	39.09	95.73	111.95	2.101	1.046
1/31/2009	3.32	9.82	2.96	20.97	39.19	96.03	112.60	1.946	1.049
2/28/2009	3.35	9.83	2.93	23.63	39.29	96.31	113.26	2.188	1.052
3/31/2009	3.06	9.85	3.22	20.02	39.38	96.62	113.88	1.864	1.054
4/30/2009	3.77	9.95	2.64	26.40	39.50	96.91	114.67	2.390	1.058
5/31/2009	4.44	10.43	2.35	24.94	39.63	97.24	115.44	2.130	1.062
6/30/2009	4.22	10.39	2.46	22.70	39.76	97.55	116.13	1.956	1.065
7/31/2009	4.45	10.46	2.35	23.53	39.90	97.87	116.85	2.003	1.068
8/31/2009	4.20	10.42	2.48	23.15	40.03	98.20	117.57	1.989	1.071
9/30/2009	4.20	10.35	2.47	23.66	40.15	98.51	118.28	2.047	1.074
10/31/2009	3.97	9.88	2.49	22.71	40.28	98.81	118.99	2.059	1.077
11/30/2009	3.87	10.00	2.58	25.84	40.39	99.11	119.76	2.325	1.081
12/31/2009	3.75	9.79	2.61	31.31	40.51	99.42	120.73	2.879	1.086
1/31/2010	3.95	9.96	2.52	31.33	40.63	99.73	121.70	2.822	1.092
2/28/2010	3.90	9.80	2.51	30.54	40.74	100.00	122.56	2.794	1.096
3/31/2010	3.79	9.87	2.60	29.80	40.86	100.31	123.48	2.716	1.101
4/30/2010	3.91	10.13	2.59	31.73	40.98	100.61	124.43	2.817	1.106
5/31/2010	3.81	10.15	2.67	31.12	41.09	100.92	125.40	2.764	1.112
6/30/2010	3.81	10.13	2.66	32.78	41.21	101.23	126.38	2.917	1.117
7/31/2010	3.78	9.95	2.63	31.85	41.33	101.54	127.37	2.883	1.122
8/31/2010	3.89	9.94	2.55	31.13	41.45	101.85	128.33	2.814	1.127
9/30/2010	3.88	9.28	2.39	31.72	41.56	102.12	129.29	3.048	1.133
10/31/2010	3.78	8.85	2.34	30.04	41.68	102.40	130.22	3.022	1.138
11/30/2010	3.58	8.67	2.42	33.25	41.79	102.66	131.21	3.427	1.144
12/31/2010	3.48	8.22	2.36	32.77	41.90	102.91	132.23	3.552	1.150