

**NORTH EBOR UNIT NO. 1
WATERFLOOD EOR PROJECT**

ANNUAL REPORT FOR 2016

April 25, 2017

Tundra Oil and Gas Partnership

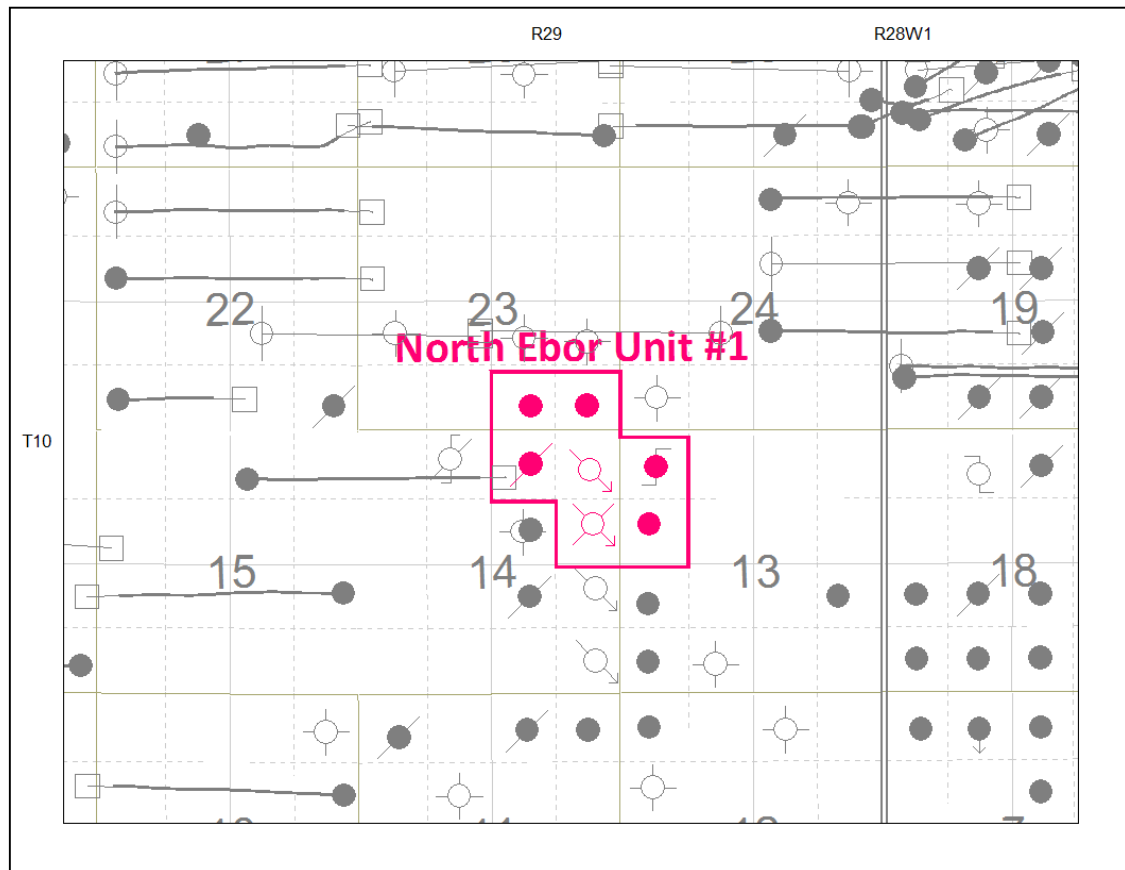
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INTRODUCTION

North Ebor Unit No. 1 Enhanced Oil Recovery (EOR) Waterflood Project was approved under Board Order No. PM 62 effective July 1, 1990 with Tundra Oil and Gas as Operator. The EOR project area, outlined in Figure 1, contains 7 wells over 7 LSDs in Township 10, Range 29 W1. Well list and well status is available in Appendix A.

Figure 1: North Ebor Unit # 1 Area Outline



In accordance with Section 73 of the Manitoba Drilling and Production Regulation, Tundra submits the following 2016 Annual Progress Report for North Ebor Unit No. 1 as required by Board Order No. PM 62.

DISCUSSION

Production History

For the wells included in North Ebor Unit No. 1, production started in June 1987 with 00/16-14-010-29W1/00 (00/16-14). Oil production peaked at 21.5 m³/d in August of 1989. In December 2016, the Unit was producing 0.79 m³/d of oil and 4.21 m³/d of water

and had a WOR of 5.34 m³/m³. There is currently no water injection in North Ebor Unit No. 1. The rates and WOR are presented in Figure 2.

Figure 2: North Ebor Unit No.1 Production/Injection Rates and WOR vs. Time

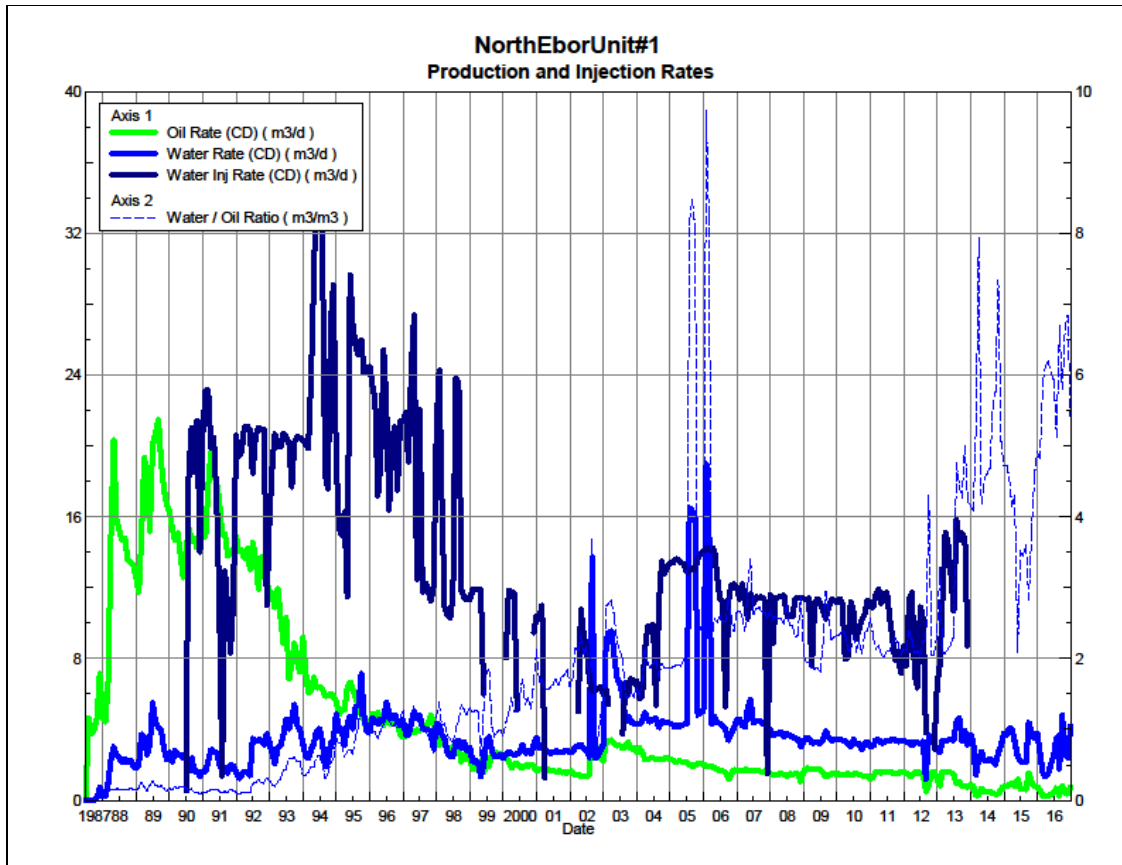
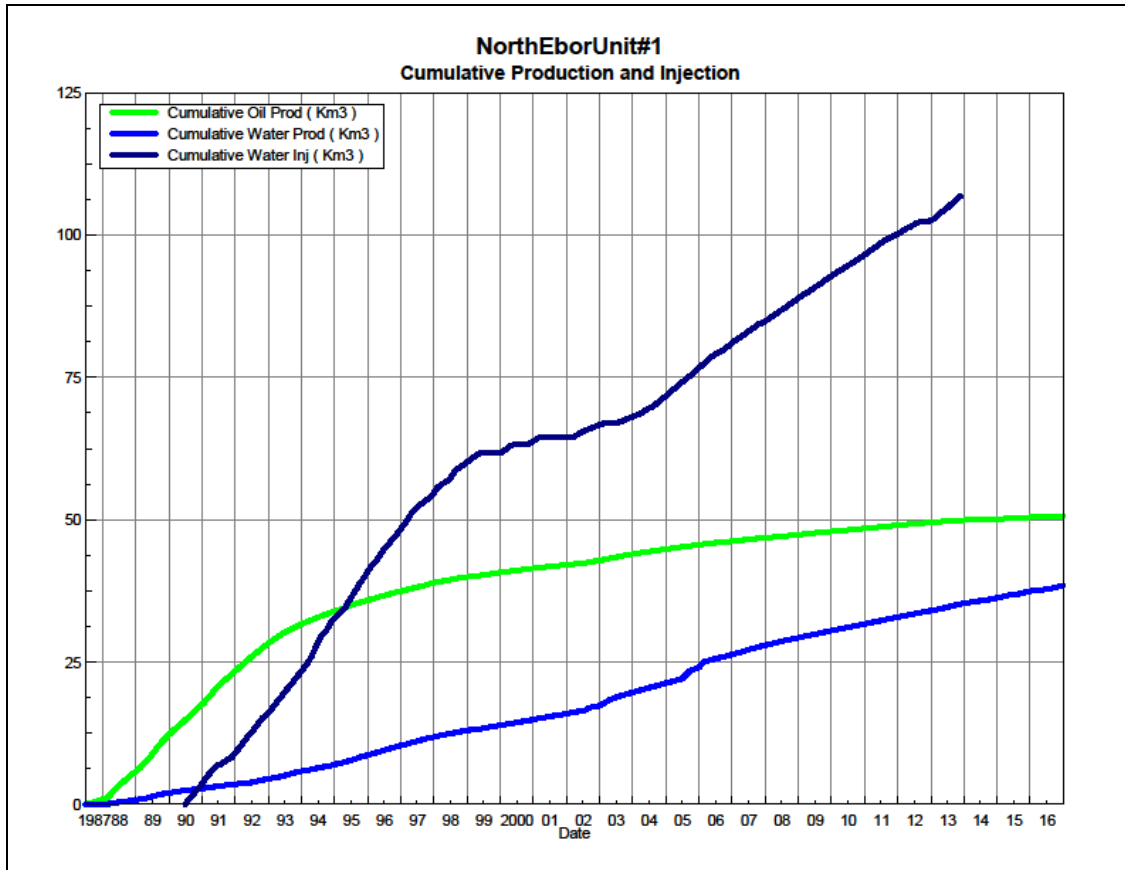


Figure 3 shows the cumulative production for North Ebor Unit No. 1 to the end of December 2016 as 50.61 e³m³ of oil, and 38.40 e³m³ of water. The cumulative water injected is 106.89 e³m³.

Figure 3: North Ebor Unit No. 1 Cumulative Oil, and Water Injected vs. Time



Waterflood History

Water injection started in June 1990 in the two injector's 00/09-14-010-29W1/0 (00/09-14) and 00/16-14-0101-29W1/0 (00/16-14). The 00/09-14 injector has been abandoned since September 1998, and water was only being injected through the 00/16-14 injector. In November 2013, the 00/16-14 vertical injector was suspended pending system modifications. An overall summary for each injector pattern is presented in Appendix C.

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 Operating Strategy and Performance

Water Source and Quality

Until November 2013, the injection water for North Ebor Unit No. 1 was being sourced from the 00/13-13-010-29W1/00 well (Lodgepole formation). Injected fluid consisted of produced water from the Lodgepole formation, from the unit and surrounding area. In the future, injection water for North Ebor Unit No. 1 will be supplied from the Jurassic source water well at 100/02-25-010-29W1 (2-25). Tundra received approval from the Petroleum Branch in March 2013 to use the 2-25 well as a source water well for waterflood operations. Jurassic-sourced water will be pumped from the 2-25 source well to the Daly 12-24-10-29 battery, where it will be filtered to 50 microns and then pumped up to injection system pressure.

Injection Wellhead Pressures

The monthly wellhead injection pressure is summarized in Appendix B, and shows all injection pressures since 2003. In November 2013, the 00/16-14 vertical injector was suspended.

Reservoir Pressure

No reservoir pressure measurements were taken at North Ebor Unit No. 1 in 2016.

Well Servicing

Table 1 lists the maintenance that was required in North Ebor Unit No. 1 in 2016.

Table 1: Service and Maintenance in North Ebor Unit No. 1

00/02-23-010-29W1/0	Pump Change	08/10/2016
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Voidage Replacement

Cumulative voidage for the North Ebor Unit No. 1 was 1.155 in December 2016. As of 1990, monthly voidage is significantly greater than 1, and in June of 1997 cumulative VRR was 1. Calculation, plots and tables of the Voidage Replacement Ratio on a monthly and cumulative basis for each injection pattern is presented in Appendix D.

Waterflood Performance Discussion

The original oil-in-place (OOIP) of the Unit is estimated at 330.0 e³m³. In 2016, the recovery factor of the Unit is 15.3% based on 50.61 e³m³ of cumulative oil recovered to date. The ultimate expected recoverable reserve based on decline analysis is 54.0 e³m³ or an ultimate recovery factor of 16.4%.

The overall performance of this waterflood has been good as indicated by waterflood response observable in the individual wells and the recovery factor is above what is attainable under primary production. However sweep efficiency has been disappointing given the volume of water injected over time and any increased or supported oil rates, that may be as a result of injected water sweeping the reservoir, are not sustained for a very long time.

Trends in production are very stable and at a mature state. No changes are anticipated in the future trends. Optimization of the waterflood will be evaluated to understand why the sweep efficiency is not higher.

List of Appendices

Appendix A: Well Name and Well Status

Appendix B: Monthly Injection Wellhead Pressures Table and Plots

Appendix C: North Ebor No.1 Injection Pattern Summary

Appendix D: Injector Pattern Production/Injection Rates, Cumulative and VRR Plot
and Table for the following injector:

00/16-14-010-29W1/0

Appendix A

UWI	Well Status
100/12-13-010-29W1/00	Capable of OIL Prod
100/13-13-010-29W1/00	ABD WTR Source
100/09-14-010-29W1/00	ABD WTR Injection
100/15-14-010-29W1/00	ABD Producer
100/16-14-010-29W1/00	WTR Injection
100/01-23-010-29W1/00	Capable of OIL Prod
100/02-23-010-29W1/00	Capable of OIL Prod

Appendix B

Average Monthly Injection Pressure (kPag)

Injection Pressure		Injection Pressure		Injection Pressure		Injection Pressure		Injection Pressure	
Month	100/16-14	Month	100/16-14	Month	100/16-14	Month	100/16-14	Month	100/16-14
		Jan-05	7770	Jan-08	6523	Jan-11	9600	Jan-14	-
		Feb-05	7770	Feb-08	8986	Feb-11	9600	Feb-14	-
		Mar-05	7770	Mar-08	9284	Mar-11	9755	Mar-14	-
		Apr-05	7708	Apr-08	9470	Apr-11	10800	Apr-14	-
		May-05	7400	May-08	9400	May-11	10800	May-14	-
		Jun-05	7400	Jun-08	7893	Jun-11	10783	Jun-14	-
		Jul-05	7400	Jul-08	6258	Jul-11	10406	Jul-14	-
Aug-02	1583	Aug-05	7400	Aug-08	8417	Aug-11	10155	Aug-14	-
Sep-02	3815	Sep-05	8090	Sep-08	7930	Sep-11	10003	Sep-14	-
Oct-02	11075	Oct-05	8300	Oct-08	8000	Oct-11	9510	Oct-14	-
Nov-02	11364	Nov-05	8300	Nov-08	7917	Nov-11	9820	Nov-14	-
Dec-02	11723	Dec-05	8300	Dec-08	7732	Dec-11	9900	Dec-14	-
Jan-03	11976	Jan-06	8300	Jan-09	7656	Jan-12	9629	Jan-15	-
Feb-03	11647	Feb-06	8441	Feb-09	7739	Feb-12	9500	Feb-15	-
Mar-03	4119	Mar-06	8480	Mar-09	3495	Mar-12	9710	Mar-15	-
Apr-03	2488	Apr-06	8483	Apr-09	6927	Apr-12	9977	Apr-15	-
May-03	1773	May-06	8678	May-09	7200	May-12	9900	May-15	-
Jun-03	1347	Jun-06	8601	Jun-09	7200	Jun-12	9870	Jun-15	-
Jul-03	2683	Jul-06	8600	Jul-09	7400	Jul-12	9419	Jul-15	-
Aug-03	4697	Aug-06	4994	Aug-09	7400	Aug-12	9600	Aug-15	-
Sep-03	5600	Sep-06	6585	Sep-09	7400	Sep-12	9600	Sep-15	-
Oct-03	6247	Oct-06	8406	Oct-09	8290	Oct-12	0	Oct-15	-
Nov-03	6440	Nov-06	8720	Nov-09	8909	Nov-12	385	Nov-15	-
Dec-03	6830	Dec-06	8657	Dec-09	9373	Dec-12	1071	Dec-15	-
Jan-04	6830	Jan-07	9116	Jan-10	9400	Jan-13	1149	Jan-16	-
Feb-04	6830	Feb-07	8945	Feb-10	9401	Feb-13	1156	Feb-16	-
Mar-04	6830	Mar-07	9000	Mar-10	9432	Mar-13	1200	Mar-16	-
Apr-04	6830	Apr-07	8700	Apr-10	6587	Apr-13	1250	Apr-16	-
May-04	7501	May-07	9000	May-10	9168	May-13	1268	May-16	-
Jun-04	7600	Jun-07	8910	Jun-10	9733	Jun-13	1299	Jun-16	-
Jul-04	7600	Jul-07	8974	Jul-10	10123	Jul-13	1347	Jul-16	-
Aug-04	7600	Aug-07	9000	Aug-10	10200	Aug-13	1371	Aug-16	-
Sep-04	7813	Sep-07	9000	Sep-10	9910	Sep-13	1404	Sep-16	-
Oct-04	7770	Oct-07	9001	Oct-10	9600	Oct-13	1425	Oct-16	-
Nov-04	7770	Nov-07	300	Nov-10	9600	Nov-13	-	Nov-16	-
Dec-04	7770	Dec-07	7897	Dec-10	9600	Dec-13	-	Dec-16	-

Appendix C

North Ebor Unit No. 1 Pattern Summary as of December 2016

Pattern Name	Injector Location (010-29W1)	Status	Supported Wells (010-29W1)	No. of Supported Wells	Allocation Factor	Pattern Prod Start Month	Inj Start Month	Oil Rate (m ³ /d)	Water Rate (m ³ /d)	WOR (m ³ /m ³)	Water Injection (m ³ /d)	Cum Oil (E ³ m ³)	Cum Water (E ³ m ³)	Cum Inj Water (E ³ m ³)	Monthly VRR	Cum VRR
00/16-14-010-29W1 Injector	00/16-14	WTR Injection	09-14, 12-13, 02/10-14 01-23, 02-23, 13-13, 15-14	7	0.5 1.0	Jun 1987	Jun 1990	0.8	4.1	5.1	-	46.9	37.4	99.4	0.0	1.14

Appendix D
Rates and VRR
Plots and Tables

Oil Formation Vol. Factor : 1.0716 m3/m3

Pattern: 00/16-14-010-29Inj Set: NorthEborUnit#1

Oil Rate (CD) : 0.69 m3/d

Water Formation Vol Factor : 1.0015 m3/m3

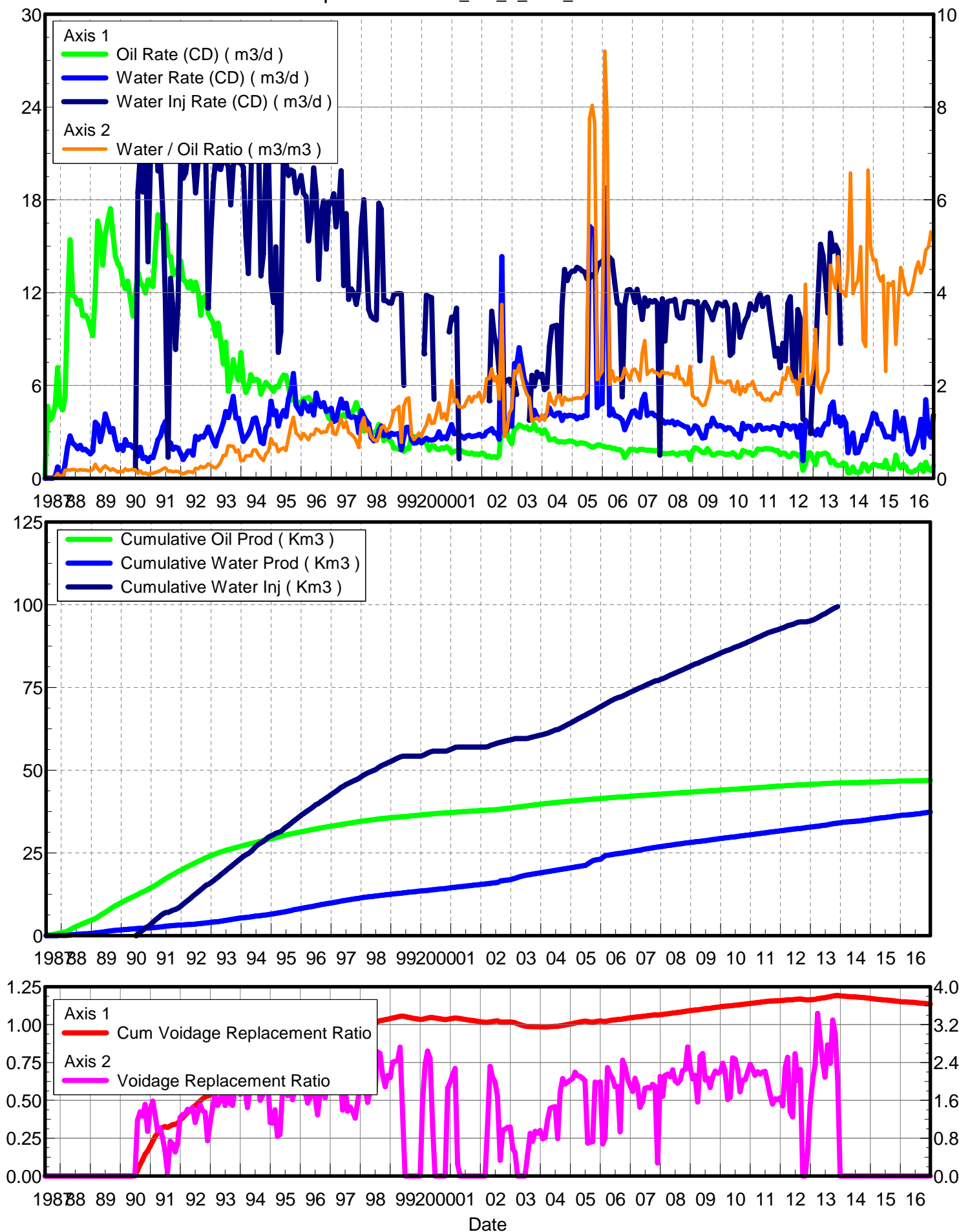
April 25, 2017

Water Rate (CD) : 3.34 m3/d

Water / Oil Ratio : 4.81 m3/m3

Operator: TUNDRA_OIL_&_GAS_LIMITED

Water Inj Rate (CD) : 8.71 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	VRR	Cum VRR
6/30/1987	0.16	0.00	0.00		0.00	0.00	0.00	0.000	0.000
7/31/1987	4.65	0.01	0.00		0.15	0.00	0.00	0.000	0.000
8/31/1987	3.76	0.01	0.00		0.27	0.00	0.00	0.000	0.000
9/30/1987	4.00	0.00	0.00		0.39	0.00	0.00	0.000	0.000
10/31/1987	4.68	0.13	0.03		0.53	0.00	0.00	0.000	0.000
11/30/1987	7.16	0.73	0.10		0.75	0.03	0.00	0.000	0.000
12/31/1987	4.69	0.21	0.05		0.89	0.03	0.00	0.000	0.000
1/31/1988	4.43	0.21	0.05		1.03	0.04	0.00	0.000	0.000
2/29/1988	5.29	0.91	0.17		1.18	0.07	0.00	0.000	0.000
3/31/1988	11.33	2.04	0.18		1.53	0.13	0.00	0.000	0.000
4/30/1988	15.41	2.74	0.18		1.99	0.21	0.00	0.000	0.000
5/31/1988	11.82	2.26	0.19		2.36	0.28	0.00	0.000	0.000
6/30/1988	11.70	2.14	0.18		2.71	0.35	0.00	0.000	0.000
7/31/1988	11.26	1.91	0.17		3.06	0.40	0.00	0.000	0.000
8/31/1988	11.50	2.13	0.19		3.42	0.47	0.00	0.000	0.000
9/30/1988	10.51	1.84	0.17		3.73	0.53	0.00	0.000	0.000
10/31/1988	10.54	1.87	0.18		4.06	0.58	0.00	0.000	0.000
11/30/1988	10.30	1.73	0.17		4.37	0.64	0.00	0.000	0.000
12/31/1988	9.75	1.57	0.16		4.67	0.68	0.00	0.000	0.000
1/31/1989	9.23	1.76	0.19		4.96	0.74	0.00	0.000	0.000
2/28/1989	12.06	3.62	0.30		5.29	0.84	0.00	0.000	0.000
3/31/1989	16.63	3.44	0.21		5.81	0.95	0.00	0.000	0.000
4/30/1989	15.86	2.37	0.15		6.29	1.02	0.00	0.000	0.000
5/31/1989	13.78	3.06	0.22		6.71	1.11	0.00	0.000	0.000
6/30/1989	15.74	4.16	0.26		7.19	1.24	0.00	0.000	0.000
7/31/1989	16.66	3.58	0.21		7.70	1.35	0.00	0.000	0.000
8/31/1989	17.44	2.99	0.17		8.24	1.44	0.00	0.000	0.000
9/30/1989	15.83	3.22	0.20		8.72	1.54	0.00	0.000	0.000
10/31/1989	14.36	2.41	0.17		9.16	1.61	0.00	0.000	0.000
11/30/1989	13.88	1.85	0.13		9.58	1.67	0.00	0.000	0.000
12/31/1989	13.58	2.11	0.16		10.00	1.73	0.00	0.000	0.000
1/31/1990	12.61	1.79	0.14		10.39	1.79	0.00	0.000	0.000
2/28/1990	12.24	2.49	0.20		10.73	1.86	0.00	0.000	0.000
3/31/1990	12.74	2.13	0.17		11.13	1.92	0.00	0.000	0.000
4/30/1990	11.67	2.17	0.19		11.48	1.99	0.00	0.000	0.000
5/31/1990	10.49	1.99	0.19		11.80	2.05	0.00	0.000	0.000
6/30/1990	11.87	2.13	0.18	0.57	12.16	2.12	0.02	0.039	0.001
7/31/1990	13.31	1.44	0.11	18.47	12.57	2.16	0.59	1.179	0.038
8/31/1990	12.64	1.99	0.16	21.02	12.96	2.22	1.24	1.355	0.077
9/30/1990	12.44	1.27	0.10	18.50	13.34	2.26	1.80	1.269	0.109
10/31/1990	11.98	1.34	0.11	21.44	13.71	2.30	2.46	1.515	0.145
11/30/1990	12.84	1.08	0.08	14.00	14.09	2.33	2.88	0.946	0.166
12/31/1990	12.53	1.35	0.11	20.78	14.48	2.38	3.53	1.408	0.197
1/31/1991	12.40	1.33	0.11	23.12	14.87	2.42	4.24	1.584	0.232
2/28/1991	14.88	1.88	0.13	23.13	15.28	2.47	4.89	1.300	0.260
3/31/1991	17.03	2.49	0.15	19.86	15.81	2.55	5.51	0.960	0.283

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	VRR	Cum VRR
4/30/1991	16.21	2.73	0.17	20.49	16.30	2.63	6.12	1.021	0.305
5/31/1991	16.35	3.32	0.20	17.06	16.80	2.73	6.65	0.820	0.321
6/30/1991	16.38	3.68	0.22	11.37	17.30	2.84	6.99	0.536	0.328
7/31/1991	14.39	2.19	0.15	1.36	17.74	2.91	7.03	0.077	0.321
8/31/1991	14.34	2.28	0.16	12.92	18.19	2.98	7.43	0.734	0.331
9/30/1991	13.15	1.87	0.14	10.81	18.58	3.04	7.76	0.678	0.339
10/31/1991	13.40	2.02	0.15	8.33	19.00	3.10	8.02	0.509	0.342
11/30/1991	13.56	1.94	0.14	11.29	19.40	3.16	8.35	0.687	0.349
12/31/1991	14.05	1.59	0.11	20.58	19.84	3.21	8.99	1.239	0.368
1/31/1992	12.83	1.21	0.09	19.40	20.24	3.24	9.59	1.299	0.386
2/29/1992	12.71	1.48	0.12	19.74	20.60	3.29	10.17	1.309	0.401
3/31/1992	12.31	1.76	0.14	21.03	20.99	3.34	10.82	1.409	0.420
4/30/1992	12.74	1.75	0.14	21.13	21.37	3.39	11.45	1.374	0.436
5/31/1992	12.10	1.49	0.12	20.86	21.74	3.44	12.10	1.446	0.453
6/30/1992	12.68	2.71	0.21	18.44	22.12	3.52	12.65	1.134	0.465
7/31/1992	12.01	2.51	0.21	20.57	22.50	3.60	13.29	1.339	0.481
8/31/1992	10.53	2.71	0.26	21.05	22.82	3.68	13.94	1.506	0.496
9/30/1992	11.65	2.66	0.23	20.90	23.17	3.76	14.57	1.383	0.510
10/31/1992	11.80	2.93	0.25	20.95	23.54	3.85	15.22	1.347	0.524
11/30/1992	10.65	3.31	0.31	11.00	23.86	3.95	15.55	0.748	0.528
12/31/1992	10.32	2.84	0.28	15.89	24.18	4.04	16.04	1.145	0.537
1/31/1993	10.03	2.37	0.24	19.05	24.49	4.12	16.63	1.454	0.549
2/28/1993	9.20	2.08	0.23	20.67	24.75	4.17	17.21	1.734	0.562
3/31/1993	10.04	2.71	0.27	20.04	25.06	4.26	17.83	1.490	0.574
4/30/1993	8.91	3.07	0.34	19.96	25.32	4.35	18.43	1.584	0.586
5/31/1993	7.38	3.60	0.49	20.69	25.55	4.46	19.07	1.799	0.600
6/30/1993	8.79	4.31	0.49	20.48	25.82	4.59	19.69	1.493	0.611
7/31/1993	5.62	3.92	0.70	20.16	25.99	4.71	20.31	2.030	0.625
8/31/1993	6.54	4.53	0.69	17.68	26.19	4.85	20.86	1.534	0.635
9/30/1993	7.67	5.29	0.69	20.20	26.42	5.01	21.47	1.497	0.645
10/31/1993	6.81	3.88	0.57	20.55	26.64	5.13	22.10	1.840	0.658
11/30/1993	6.34	3.87	0.61	20.43	26.83	5.25	22.72	1.918	0.669
12/31/1993	8.12	3.10	0.38	20.35	27.08	5.34	23.35	1.727	0.681
1/31/1994	6.23	2.38	0.38	20.10	27.27	5.42	23.97	2.223	0.693
2/28/1994	5.54	2.65	0.48	15.68	27.43	5.49	24.41	1.830	0.701
3/31/1994	5.85	2.86	0.49	13.23	27.61	5.58	24.82	1.450	0.707
4/30/1994	6.69	3.21	0.48	19.10	27.81	5.68	25.39	1.842	0.717
5/31/1994	6.31	3.83	0.61	25.10	28.00	5.80	26.17	2.372	0.732
6/30/1994	6.39	3.90	0.61	25.98	28.20	5.91	26.95	2.419	0.747
7/31/1994	6.34	3.21	0.51	22.30	28.39	6.01	27.64	2.232	0.760
8/31/1994	5.43	2.35	0.43	13.08	28.56	6.09	28.05	1.603	0.766
9/30/1994	5.89	2.25	0.38	14.52	28.74	6.15	28.48	1.700	0.772
10/31/1994	6.20	3.25	0.52	20.42	28.93	6.25	29.11	2.069	0.783
11/30/1994	6.01	3.50	0.58	21.20	29.11	6.36	29.75	2.135	0.794
12/31/1994	5.82	4.98	0.85	12.67	29.29	6.51	30.14	1.131	0.797
1/31/1995	5.61	4.12	0.73	11.35	29.46	6.64	30.49	1.122	0.799

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	VRR	Cum VRR
2/28/1995	5.92	4.35	0.74	14.95	29.63	6.76	30.91	1.399	0.804
3/31/1995	5.91	3.38	0.57	8.14	29.81	6.87	31.17	0.839	0.804
4/30/1995	6.35	3.97	0.63	9.47	30.00	6.99	31.45	0.880	0.805
5/31/1995	6.67	4.36	0.65	21.43	30.21	7.12	32.11	1.865	0.815
6/30/1995	6.64	3.99	0.60	20.42	30.41	7.24	32.73	1.841	0.823
7/31/1995	5.95	5.13	0.86	19.58	30.59	7.40	33.33	1.703	0.831
8/31/1995	5.05	5.69	1.13	19.93	30.75	7.58	33.95	1.798	0.839
9/30/1995	5.16	6.77	1.31	19.84	30.90	7.78	34.55	1.614	0.846
10/31/1995	4.84	4.72	0.98	18.45	31.05	7.93	35.12	1.865	0.854
11/30/1995	4.82	4.45	0.92	19.02	31.20	8.06	35.69	1.982	0.862
12/31/1995	4.93	4.17	0.84	19.57	31.35	8.19	36.30	2.073	0.870
1/31/1996	5.14	4.95	0.96	18.42	31.51	8.34	36.87	1.763	0.877
2/29/1996	5.17	4.64	0.90	18.21	31.66	8.48	37.40	1.790	0.883
3/31/1996	5.22	4.35	0.83	15.35	31.82	8.61	37.87	1.546	0.888
4/30/1996	5.02	4.74	0.94	16.82	31.97	8.75	38.38	1.665	0.894
5/31/1996	4.35	4.08	0.94	20.07	32.11	8.88	39.00	2.298	0.902
6/30/1996	5.16	5.50	1.07	18.39	32.26	9.05	39.55	1.669	0.908
7/31/1996	4.70	4.89	1.04	12.86	32.41	9.20	39.95	1.296	0.911
8/31/1996	4.74	4.63	0.98	17.06	32.56	9.34	40.48	1.759	0.917
9/30/1996	4.87	4.88	1.00	17.93	32.70	9.49	41.01	1.776	0.923
10/31/1996	4.32	4.32	1.00	14.82	32.84	9.62	41.47	1.656	0.927
11/30/1996	3.88	4.43	1.14	17.87	32.95	9.75	42.01	2.083	0.934
12/31/1996	3.76	4.53	1.21	17.78	33.07	9.89	42.56	2.081	0.940
1/31/1997	3.84	3.68	0.96	18.39	33.19	10.01	43.13	2.362	0.948
2/28/1997	3.95	3.73	0.95	16.25	33.30	10.11	43.59	2.042	0.953
3/31/1997	3.99	4.51	1.13	17.50	33.42	10.25	44.13	1.994	0.959
4/30/1997	3.98	5.11	1.28	19.88	33.54	10.41	44.72	2.120	0.967
5/31/1997	4.13	4.52	1.10	12.46	33.67	10.55	45.11	1.394	0.969
6/30/1997	3.98	4.84	1.22	17.11	33.79	10.69	45.62	1.881	0.974
7/31/1997	4.11	4.05	0.99	11.55	33.92	10.82	45.98	1.368	0.977
8/31/1997	4.15	3.94	0.95	12.25	34.04	10.94	46.36	1.462	0.979
9/30/1997	4.44	3.97	0.89	11.95	34.18	11.06	46.72	1.371	0.981
10/31/1997	4.89	3.93	0.80	11.24	34.33	11.18	47.07	1.227	0.983
11/30/1997	4.43	2.93	0.66	12.12	34.46	11.27	47.43	1.580	0.986
12/31/1997	3.80	4.36	1.15	16.21	34.58	11.40	47.94	1.925	0.991
1/31/1998	3.06	3.99	1.30	18.00	34.67	11.53	48.49	2.479	0.998
2/28/1998	3.66	3.72	1.02	14.28	34.78	11.63	48.89	1.869	1.001
3/31/1998	3.25	3.52	1.08	10.91	34.88	11.74	49.23	1.558	1.004
4/30/1998	2.96	2.65	0.89	10.46	34.97	11.82	49.54	1.799	1.007
5/31/1998	2.94	2.43	0.83	10.31	35.06	11.89	49.86	1.848	1.010
6/30/1998	3.06	2.45	0.80	10.24	35.15	11.97	50.17	1.789	1.012
7/31/1998	3.46	3.07	0.89	17.78	35.26	12.06	50.72	2.625	1.019
8/31/1998	3.12	3.38	1.08	17.38	35.35	12.17	51.26	2.590	1.026
9/30/1998	2.43	2.75	1.13	11.49	35.43	12.25	51.61	2.149	1.029
10/31/1998	2.90	2.95	1.02	11.46	35.52	12.34	51.96	1.892	1.033
11/30/1998	2.48	2.68	1.08	11.33	35.59	12.42	52.30	2.126	1.036

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	VRR	Cum VRR
12/31/1998	2.36	2.91	1.23	11.32	35.66	12.51	52.65	2.084	1.039
1/31/1999	1.95	2.85	1.46	11.87	35.72	12.60	53.02	2.404	1.044
2/28/1999	1.93	2.86	1.48	11.92	35.78	12.68	53.35	2.423	1.047
3/31/1999	1.87	2.89	1.54	11.93	35.84	12.77	53.72	2.438	1.051
4/30/1999	2.37	1.84	0.77	11.92	35.91	12.83	54.08	2.724	1.056
5/31/1999	1.73	2.70	1.56	6.00	35.96	12.91	54.27	1.319	1.056
6/30/1999	1.93	3.29	1.70		36.02	13.01	54.27	0.000	1.053
7/31/1999	1.91	3.30	1.73		36.08	13.11	54.27	0.000	1.050
8/31/1999	2.68	2.52	0.94		36.16	13.19	54.27	0.000	1.046
9/30/1999	2.70	2.26	0.84		36.24	13.26	54.27	0.000	1.043
10/31/1999	2.54	2.29	0.90		36.32	13.33	54.27	0.000	1.040
11/30/1999	2.54	2.48	0.98		36.40	13.40	54.27	0.000	1.037
12/31/1999	2.53	2.30	0.91		36.48	13.47	54.27	0.000	1.034
1/31/2000	2.34	2.47	1.06	8.05	36.55	13.55	54.52	1.619	1.036
2/29/2000	2.26	2.59	1.15	11.83	36.61	13.63	54.86	2.363	1.039
3/31/2000	1.83	2.49	1.36	11.73	36.67	13.70	55.22	2.640	1.044
4/30/2000	2.09	2.47	1.18	11.68	36.73	13.78	55.57	2.481	1.047
5/31/2000	2.10	2.49	1.19	5.10	36.80	13.85	55.73	1.077	1.047
6/30/2000	1.89	2.63	1.39		36.86	13.93	55.73	0.000	1.045
7/31/2000	1.85	3.00	1.63		36.91	14.03	55.73	0.000	1.042
8/31/2000	1.98	2.55	1.29		36.97	14.11	55.73	0.000	1.039
9/30/2000	1.92	2.67	1.39		37.03	14.19	55.73	0.000	1.036
10/31/2000	2.04	2.56	1.25		37.10	14.26	55.73	0.000	1.033
11/30/2000	1.91	3.04	1.59	9.46	37.15	14.36	56.02	1.863	1.036
12/31/2000	1.65	3.47	2.10	10.41	37.20	14.46	56.34	1.986	1.039
1/31/2001	1.75	2.89	1.65	10.25	37.26	14.55	56.66	2.151	1.042
2/28/2001	1.75	2.96	1.69	11.00	37.31	14.64	56.96	2.276	1.045
3/31/2001	1.84	2.83	1.54	1.25	37.36	14.72	57.00	0.260	1.042
4/30/2001	1.78	2.72	1.53		37.42	14.81	57.00	0.000	1.040
5/31/2001	1.68	2.59	1.54		37.47	14.89	57.00	0.000	1.037
6/30/2001	1.64	2.73	1.66		37.52	14.97	57.00	0.000	1.035
7/31/2001	1.58	2.77	1.76		37.57	15.05	57.00	0.000	1.032
8/31/2001	1.64	2.69	1.64		37.62	15.14	57.00	0.000	1.030
9/30/2001	1.54	2.72	1.76		37.66	15.22	57.00	0.000	1.027
10/31/2001	1.57	2.76	1.76		37.71	15.30	57.00	0.000	1.025
11/30/2001	1.53	2.84	1.85		37.76	15.39	57.00	0.000	1.022
12/31/2001	1.65	2.70	1.64		37.81	15.47	57.00	0.000	1.020
1/31/2002	1.57	2.75	1.75		37.86	15.56	57.00	0.000	1.017
2/28/2002	1.40	3.01	2.15		37.90	15.64	57.00	0.000	1.015
3/31/2002	1.44	3.09	2.14	5.01	37.94	15.74	57.16	1.083	1.015
4/30/2002	1.36	3.21	2.36	10.80	37.98	15.83	57.48	2.317	1.018
5/31/2002	1.39	2.92	2.10	9.21	38.03	15.92	57.77	2.088	1.021
6/30/2002	1.33	2.92	2.19	8.63	38.07	16.01	58.03	1.989	1.023
7/31/2002	1.47	2.52	1.71	6.89	38.11	16.09	58.24	1.684	1.025
8/31/2002	3.83	14.33	3.74	6.16	38.23	16.53	58.43	0.335	1.018
9/30/2002	3.25	2.92	0.90	6.20	38.33	16.62	58.62	0.971	1.017

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	VRR	Cum VRR
10/31/2002	3.01	3.13	1.04	6.32	38.42	16.72	58.81	0.995	1.017
11/30/2002	2.50	3.54	1.41	6.40	38.50	16.82	59.01	1.031	1.017
12/31/2002	2.23	3.36	1.51	5.98	38.57	16.93	59.19	1.039	1.018
1/31/2003	3.20	7.41	2.31	6.23	38.67	17.16	59.38	0.575	1.015
2/28/2003	3.25	7.36	2.26	5.41	38.76	17.37	59.54	0.499	1.012
3/31/2003	3.46	8.44	2.44		38.86	17.63	59.54	0.000	1.006
4/30/2003	3.37	7.38	2.19		38.97	17.85	59.54	0.000	1.000
5/31/2003	3.26	6.36	1.95		39.07	18.05	59.54	0.000	0.995
6/30/2003	3.33	6.01	1.81		39.17	18.23	59.54	0.000	0.990
7/31/2003	3.12	5.40	1.73	3.75	39.26	18.39	59.65	0.429	0.988
8/31/2003	3.20	3.95	1.23	6.65	39.36	18.52	59.86	0.901	0.988
9/30/2003	3.48	4.39	1.26	5.96	39.47	18.65	60.04	0.735	0.987
10/31/2003	3.07	3.98	1.29	6.87	39.56	18.77	60.25	0.946	0.986
11/30/2003	3.14	3.89	1.24	6.56	39.66	18.89	60.45	0.905	0.986
12/31/2003	2.88	3.93	1.37	6.74	39.75	19.01	60.66	0.961	0.986
1/31/2004	3.14	3.92	1.25	5.73	39.84	19.13	60.83	0.787	0.985
2/29/2004	2.89	4.10	1.42	5.87	39.93	19.25	61.00	0.816	0.985
3/31/2004	2.48	4.54	1.83	8.53	40.00	19.39	61.27	1.186	0.986
4/30/2004	2.51	4.16	1.66	9.79	40.08	19.52	61.56	1.430	0.987
5/31/2004	2.54	4.03	1.58	9.85	40.16	19.64	61.87	1.458	0.989
6/30/2004	2.39	4.19	1.75	9.89	40.23	19.77	62.16	1.465	0.990
7/31/2004	2.35	4.22	1.80	5.33	40.30	19.90	62.33	0.791	0.989
8/31/2004	2.37	3.74	1.58	11.13	40.38	20.01	62.67	1.776	0.992
9/30/2004	2.33	4.07	1.75	13.50	40.44	20.13	63.08	2.059	0.995
10/31/2004	2.38	4.02	1.69	12.77	40.52	20.26	63.47	1.947	0.998
11/30/2004	2.41	4.07	1.69	13.20	40.59	20.38	63.87	1.988	1.001
12/31/2004	2.38	4.05	1.70	13.40	40.66	20.51	64.29	2.031	1.005
1/31/2005	2.32	4.00	1.72	13.39	40.74	20.63	64.70	2.065	1.008
2/28/2005	2.22	3.83	1.73	13.63	40.80	20.74	65.08	2.197	1.011
3/31/2005	2.28	3.95	1.73	13.55	40.87	20.86	65.50	2.121	1.015
4/30/2005	2.27	3.92	1.72	13.41	40.94	20.98	65.91	2.110	1.018
5/31/2005	2.25	4.05	1.80	13.33	41.01	21.10	66.32	2.063	1.021
6/30/2005	2.20	4.05	1.84	12.89	41.07	21.23	66.71	2.015	1.024
7/31/2005	2.10	16.29	7.76	12.94	41.14	21.73	67.11	0.698	1.021
8/31/2005	2.00	16.11	8.03	13.15	41.20	22.23	67.51	0.720	1.018
9/30/2005	2.05	15.72	7.67	13.00	41.26	22.70	67.90	0.726	1.016
10/31/2005	2.15	4.57	2.12	13.64	41.33	22.84	68.33	1.987	1.019
11/30/2005	2.16	4.79	2.22	13.91	41.39	22.99	68.74	1.960	1.022
12/31/2005	2.09	4.82	2.31	14.03	41.46	23.14	69.18	1.990	1.025
1/31/2006	2.04	18.77	9.20	14.25	41.52	23.72	69.62	0.680	1.022
2/28/2006	2.01	15.58	7.77	14.15	41.58	24.15	70.02	0.798	1.020
3/31/2006	2.01	4.08	2.02	14.27	41.64	24.28	70.46	2.291	1.024
4/30/2006	1.93	4.47	2.31	14.08	41.70	24.41	70.88	2.153	1.027
5/31/2006	1.94	4.05	2.09	12.61	41.76	24.54	71.27	2.060	1.030
6/30/2006	1.85	4.01	2.17	11.32	41.81	24.66	71.61	1.891	1.032
7/31/2006	1.86	3.92	2.11	11.20	41.87	24.78	71.96	1.895	1.035

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	VRR	Cum VRR
8/31/2006	1.74	3.75	2.16	5.26	41.93	24.90	72.12	0.938	1.034
9/30/2006	1.33	3.14	2.37	11.18	41.97	24.99	72.46	2.452	1.037
10/31/2006	1.60	3.56	2.23	12.15	42.01	25.10	72.83	2.305	1.040
11/30/2006	1.87	3.94	2.11	12.21	42.07	25.22	73.20	2.056	1.043
12/31/2006	1.85	4.32	2.33	12.02	42.13	25.36	73.57	1.906	1.045
1/31/2007	1.86	4.36	2.35	11.36	42.19	25.49	73.93	1.790	1.047
2/28/2007	1.77	4.03	2.27	12.22	42.24	25.60	74.27	2.063	1.049
3/31/2007	1.87	3.93	2.10	11.30	42.29	25.73	74.62	1.906	1.052
4/30/2007	1.88	5.07	2.70	10.26	42.35	25.88	74.93	1.451	1.053
5/31/2007	1.83	5.43	2.97	11.65	42.41	26.05	75.29	1.577	1.055
6/30/2007	1.81	4.06	2.24	11.13	42.46	26.17	75.62	1.857	1.057
7/31/2007	1.82	4.19	2.31	11.48	42.52	26.30	75.98	1.872	1.059
8/31/2007	1.80	4.20	2.34	11.38	42.57	26.43	76.33	1.860	1.061
9/30/2007	1.77	4.04	2.28	11.50	42.63	26.55	76.67	1.939	1.063
10/31/2007	1.79	4.05	2.26	11.30	42.68	26.67	77.02	1.892	1.065
11/30/2007	1.66	3.64	2.20	1.49	42.73	26.78	77.07	0.276	1.063
12/31/2007	1.63	3.77	2.31	11.60	42.78	26.90	77.43	2.103	1.066
1/31/2008	1.58	3.56	2.26	8.88	42.83	27.01	77.70	1.690	1.067
2/29/2008	1.61	3.64	2.27	11.40	42.88	27.12	78.04	2.126	1.069
3/31/2008	1.60	3.60	2.24	11.46	42.93	27.23	78.39	2.159	1.072
4/30/2008	1.65	3.70	2.24	11.47	42.98	27.34	78.73	2.100	1.074
5/31/2008	1.59	3.45	2.17	11.56	43.03	27.45	79.09	2.245	1.077
6/30/2008	1.50	3.62	2.41	10.50	43.07	27.55	79.41	2.012	1.079
7/31/2008	1.64	3.52	2.14	10.35	43.12	27.66	79.73	1.964	1.081
8/31/2008	1.60	3.42	2.14	10.37	43.17	27.77	80.05	2.023	1.083
9/30/2008	1.66	3.33	2.01	11.37	43.22	27.87	80.39	2.228	1.085
10/31/2008	1.63	3.30	2.02	11.43	43.27	27.97	80.75	2.262	1.088
11/30/2008	1.20	2.90	2.41	11.40	43.31	28.06	81.09	2.727	1.090
12/31/2008	1.75	3.12	1.78	11.39	43.36	28.15	81.44	2.282	1.093
1/31/2009	1.97	3.39	1.72	11.30	43.42	28.26	81.79	2.053	1.095
2/28/2009	1.92	3.30	1.72	11.41	43.48	28.35	82.11	2.130	1.097
3/31/2009	1.80	2.92	1.63	7.58	43.53	28.44	82.35	1.566	1.098
4/30/2009	1.66	2.61	1.57	11.09	43.58	28.52	82.68	2.532	1.101
5/31/2009	1.65	2.63	1.59	11.37	43.63	28.60	83.03	2.588	1.103
6/30/2009	1.92	3.40	1.77	11.09	43.69	28.70	83.36	2.032	1.105
7/31/2009	1.69	3.36	1.98	10.72	43.74	28.81	83.70	2.073	1.107
8/31/2009	1.49	3.88	2.61	10.25	43.79	28.93	84.01	1.872	1.109
9/30/2009	1.53	3.56	2.32	10.86	43.84	29.04	84.34	2.089	1.111
10/31/2009	1.63	3.36	2.07	11.34	43.89	29.14	84.69	2.220	1.113
11/30/2009	1.64	3.42	2.09	11.26	43.94	29.24	85.03	2.176	1.115
12/31/2009	1.62	3.33	2.06	11.15	43.99	29.35	85.37	2.201	1.118
1/31/2010	1.53	3.13	2.05	11.38	44.03	29.44	85.73	2.385	1.120
2/28/2010	1.56	3.27	2.09	11.03	44.08	29.53	86.04	2.233	1.122
3/31/2010	1.55	3.25	2.09	7.95	44.13	29.64	86.28	1.617	1.123
4/30/2010	1.65	3.13	1.90	8.13	44.17	29.73	86.53	1.661	1.124
5/31/2010	1.53	2.85	1.86	11.21	44.22	29.82	86.87	2.497	1.127

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	VRR	Cum VRR
6/30/2010	1.36	2.84	2.08	10.62	44.26	29.90	87.19	2.471	1.129
7/31/2010	1.41	2.54	1.81	9.11	44.31	29.98	87.47	2.254	1.131
8/31/2010	1.80	3.54	1.96	9.73	44.36	30.09	87.78	1.780	1.132
9/30/2010	1.72	3.20	1.86	10.20	44.41	30.19	88.08	2.024	1.134
10/31/2010	1.67	3.36	2.01	10.50	44.47	30.29	88.41	2.038	1.136
11/30/2010	1.67	3.34	2.00	11.28	44.52	30.39	88.75	2.200	1.138
12/31/2010	1.48	3.08	2.08	11.00	44.56	30.49	89.09	2.363	1.140
1/31/2011	1.62	3.10	1.91	10.88	44.61	30.58	89.42	2.251	1.142
2/28/2011	1.89	3.41	1.80	11.58	44.66	30.68	89.75	2.129	1.144
3/31/2011	1.86	3.42	1.84	11.92	44.72	30.79	90.12	2.203	1.146
4/30/2011	1.85	3.17	1.71	11.10	44.78	30.88	90.45	2.157	1.148
5/31/2011	1.92	3.23	1.68	11.62	44.84	30.98	90.81	2.200	1.151
6/30/2011	1.90	3.26	1.71	11.71	44.89	31.08	91.16	2.214	1.153
7/31/2011	1.90	3.17	1.67	10.29	44.95	31.18	91.48	1.979	1.154
8/31/2011	1.86	3.34	1.79	9.14	45.01	31.28	91.77	1.714	1.156
9/30/2011	1.77	3.28	1.85	7.88	45.06	31.38	92.00	1.523	1.156
10/31/2011	1.79	3.24	1.81	8.39	45.12	31.48	92.26	1.630	1.157
11/30/2011	1.53	2.79	1.82	7.15	45.17	31.56	92.48	1.612	1.158
12/31/2011	1.63	3.53	2.16	8.72	45.22	31.67	92.75	1.652	1.159
1/31/2012	1.60	3.40	2.13	7.58	45.27	31.78	92.98	1.485	1.160
2/29/2012	1.43	3.41	2.39	11.29	45.31	31.88	93.31	2.289	1.162
3/31/2012	1.40	3.18	2.27	11.74	45.35	31.97	93.67	2.512	1.164
4/30/2012	1.62	3.38	2.08	7.01	45.40	32.08	93.88	1.371	1.164
5/31/2012	1.60	3.36	2.10	6.35	45.45	32.18	94.08	1.251	1.165
6/30/2012	1.47	2.65	1.81	10.91	45.49	32.26	94.41	2.584	1.167
7/31/2012	1.54	3.43	2.23	10.25	45.54	32.37	94.73	2.020	1.168
8/31/2012	0.52	1.14	2.20	3.81	45.56	32.40	94.84	2.251	1.169
9/30/2012	0.90	3.75	4.18		45.58	32.51	94.84	0.000	1.167
10/31/2012	1.64	3.36	2.05		45.63	32.62	94.84	0.000	1.165
11/30/2012	1.64	3.36	2.05	2.90	45.68	32.72	94.93	0.567	1.164
12/31/2012	1.25	2.97	2.37	6.49	45.72	32.81	95.13	1.506	1.164
1/31/2013	0.88	2.81	3.21	7.72	45.75	32.90	95.37	2.061	1.166
2/28/2013	1.59	3.15	1.98	11.43	45.79	32.99	95.69	2.356	1.168
3/31/2013	1.51	2.79	1.84	15.13	45.84	33.07	96.16	3.436	1.171
4/30/2013	1.60	3.27	2.05	14.40	45.89	33.17	96.59	2.889	1.174
5/31/2013	1.62	3.54	2.19	12.78	45.94	33.28	96.99	2.424	1.177
6/30/2013	1.51	3.49	2.31	10.68	45.98	33.39	97.31	2.089	1.179
7/31/2013	1.01	4.63	4.59	15.85	46.02	33.53	97.80	2.774	1.182
8/31/2013	1.15	4.93	4.30	14.66	46.05	33.68	98.25	2.383	1.185
9/30/2013	0.89	3.62	4.09	15.07	46.08	33.79	98.71	3.297	1.188
10/31/2013	0.84	3.99	4.77	14.70	46.10	33.91	99.16	3.010	1.192
11/30/2013	0.84	3.38	4.04	8.71	46.13	34.02	99.42	2.038	1.193
12/31/2013	0.98	3.95	4.02		46.16	34.14	99.42	0.000	1.191
1/31/2014	0.91	3.57	3.92		46.19	34.25	99.42	0.000	1.189
2/28/2014	0.37	1.65	4.47		46.20	34.30	99.42	0.000	1.188
3/31/2014	0.39	2.55	6.58		46.21	34.37	99.42	0.000	1.187

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	VRR	Cum VRR
4/30/2014	0.73	2.92	3.98		46.23	34.46	99.42	0.000	1.185
5/31/2014	0.40	1.65	4.16		46.24	34.51	99.42	0.000	1.184
6/30/2014	0.39	1.66	4.26		46.26	34.56	99.42	0.000	1.183
7/31/2014	0.42	2.12	4.99		46.27	34.63	99.42	0.000	1.182
8/31/2014	0.93	2.75	2.97		46.30	34.71	99.42	0.000	1.180
9/30/2014	0.88	2.49	2.84		46.32	34.79	99.42	0.000	1.179
10/31/2014	0.47	3.10	6.64		46.34	34.88	99.42	0.000	1.177
11/30/2014	0.71	3.52	4.97		46.36	34.99	99.42	0.000	1.176
12/31/2014	0.89	4.20	4.71		46.39	35.12	99.42	0.000	1.173
1/31/2015	0.87	4.11	4.71		46.41	35.25	99.42	0.000	1.171
2/28/2015	0.80	3.53	4.40		46.44	35.35	99.42	0.000	1.170
3/31/2015	0.83	3.51	4.25		46.46	35.45	99.42	0.000	1.168
4/30/2015	0.72	3.13	4.36		46.48	35.55	99.42	0.000	1.166
5/31/2015	1.16	2.66	2.30		46.52	35.63	99.42	0.000	1.164
6/30/2015	0.64	2.69	4.20		46.54	35.71	99.42	0.000	1.163
7/31/2015	0.64	2.66	4.16		46.56	35.79	99.42	0.000	1.162
8/31/2015	0.60	2.54	4.24		46.58	35.87	99.42	0.000	1.160
9/30/2015	1.49	4.30	2.89		46.62	36.00	99.42	0.000	1.158
10/31/2015	0.88	3.36	3.80		46.65	36.11	99.42	0.000	1.156
11/30/2015	0.68	3.06	4.54		46.67	36.20	99.42	0.000	1.155
12/31/2015	0.90	3.88	4.30		46.70	36.32	99.42	0.000	1.153
1/31/2016	0.73	2.91	4.00		46.72	36.41	99.42	0.000	1.151
2/29/2016	0.45	1.79	3.95		46.73	36.46	99.42	0.000	1.150
3/31/2016	0.39	1.57	4.00		46.75	36.51	99.42	0.000	1.149
4/30/2016	0.42	1.76	4.20		46.76	36.56	99.42	0.000	1.149
5/31/2016	0.52	2.35	4.50		46.77	36.64	99.42	0.000	1.147
6/30/2016	0.60	2.80	4.66		46.79	36.72	99.42	0.000	1.146
7/31/2016	0.86	3.81	4.42		46.82	36.84	99.42	0.000	1.144
8/31/2016	0.44	2.00	4.59		46.83	36.90	99.42	0.000	1.143
9/30/2016	1.03	5.07	4.92		46.86	37.05	99.42	0.000	1.141
10/31/2016	0.58	2.90	4.99		46.88	37.14	99.42	0.000	1.139
11/30/2016	0.50	2.66	5.31		46.90	37.22	99.42	0.000	1.138
12/31/2016	0.80	4.08	5.10		46.92	37.35	99.42	0.000	1.136