

**SINCLAIR UNIT NO. 7
WATERFLOOD EOR PROJECT**

ANNUAL REPORT FOR 2017

June 15, 2018

Tundra Oil and Gas

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03/01-14-008-29W1 (Inter-Unit Injector)

02/08-14-008-29W1

03/08-14-008-29W1

02/09-14-008-29W1

02/16-14-008-29W1

02/04-15-008-29W1 (Inter-Unit Injector)

02/05-15-008-29W1

03/05-15-008-29W1

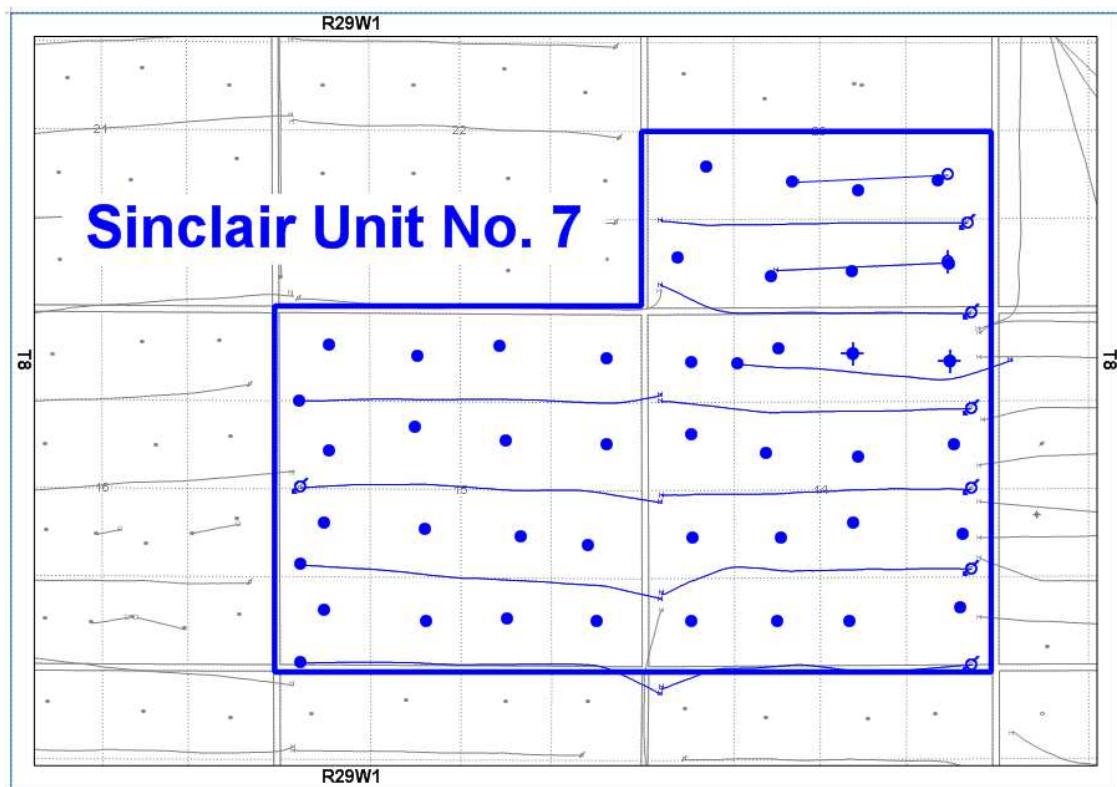
04/12-15-008-29W1

02/01-23-008-29W1

INTRODUCTION

Sinclair Unit No. 7 Enhanced Oil Recovery (EOR) Waterflood was approved under Waterflood Order No. 26 effective July 1, 2013 with Tundra Oil and Gas (Tundra) as operator. The Unit area contains 42 producing wells, 2 abandoned wells and 7 injection wells in 2½ sections in Township 8 Range 29 W1 as shown in the figure below.

Figure 1: Sinclair Unit 7 Area Outline



In accordance with Section 73 of the Manitoba Drilling and Production Regulation, Tundra hereby submits the following 2017 Annual Progress Report for Sinclair Unit No. 7.

DISCUSSION

Production History

For the wells included in Sinclair Unit No. 7, production started in March 2005 with 00/13-14-008-29W1 and 00/13-15-008-29W1. Average oil production peaked at 5.3 m³/d per well in March of 2006. This production was coming from 27 wells and totaled 142.7 m³/d for the whole Unit. In December 2017, the Unit was producing 38.43 m³/d of oil and

16.44 m³/d of water and had an average WOR of 0.39 m³/m³. Water injection commenced in Sinclair Unit No. 7 in August 2013. The rates and WOR are presented in Figure 2.

Figure 2: Sinclair Unit 7 Production/Injection Rates and WOR vs Time

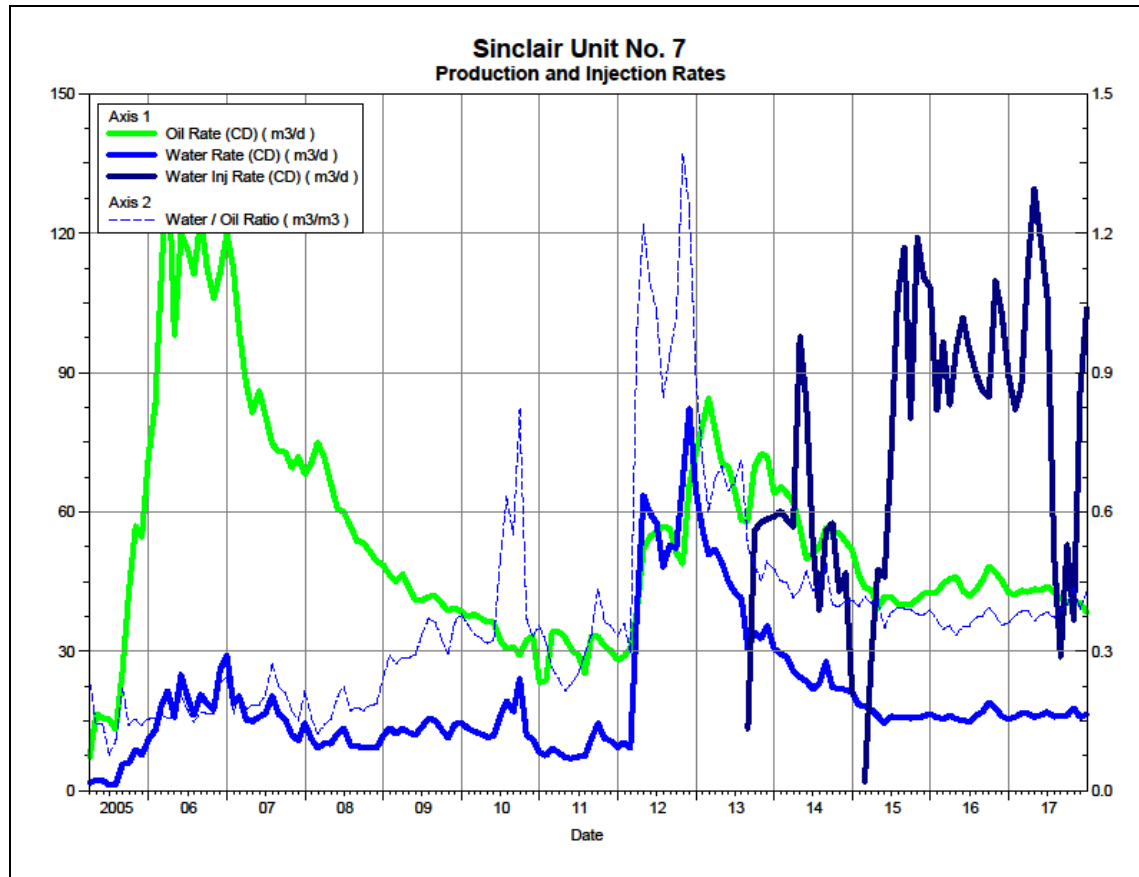
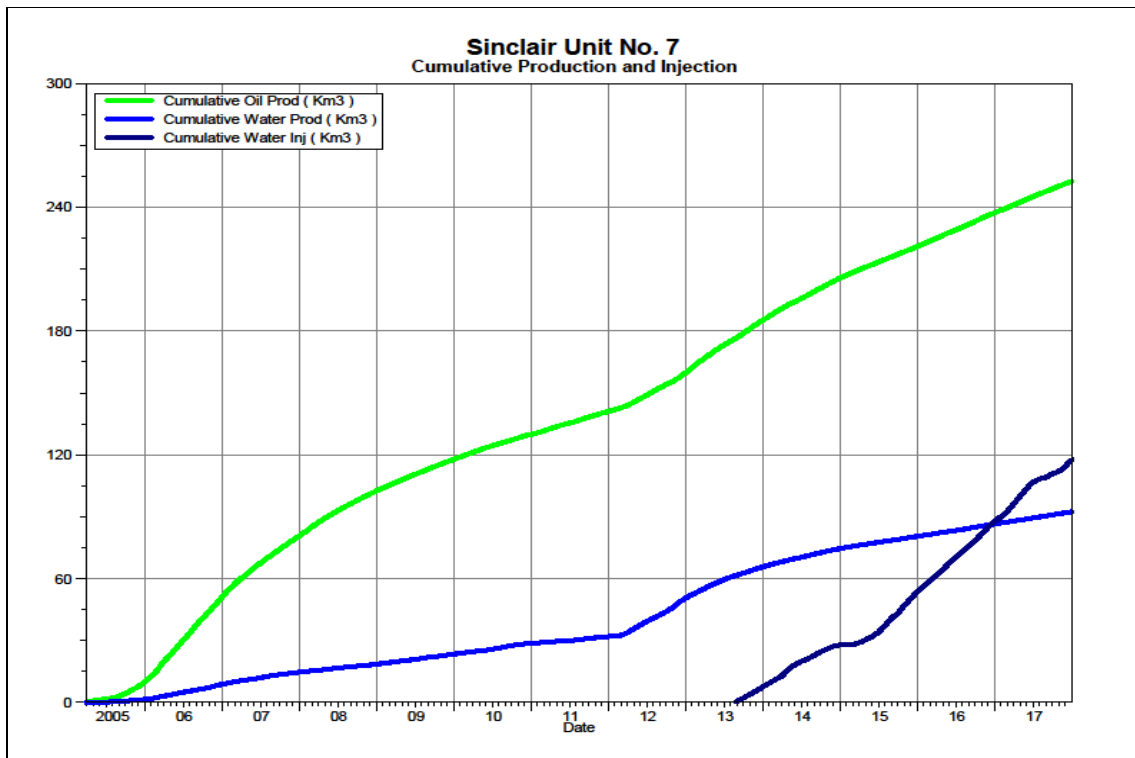


Figure 3 shows the cumulative production for Sinclair Unit 7 to the end of December 2017 as 252.6 e³m³ of oil, and 92.4 e³m³ of water, representing a 13.3% recovery factor of the OOIP (1896.0 e³m³). The cumulative water injection is 117.7 e³m³.

Figure 3: Sinclair Unit 7 Cumulative Oil, Water and Water Injected vs Time



Waterflood Development Plan

Sinclair Unit No 7 Waterflood (WF) Development Plan

Sinclair Unit No. 7 is still in the development phase at the end of 2017. In 2011, 2 of the 8 proposed horizontal injectors were drilled and the remaining 6 horizontal injection wells were drilled in 2012. In 2013, 2 inter-unit horizontal wells were drilled at 03/01-14 and 02/04-15-008-29W1/0. After producing the injectors for over a year to create voidage and improve water recovery, water injection commenced in Sinclair Unit No. 7 in August 2013 after the conversion of the 02/01-23-008-29W1 producer to an injector. In September 2017, Tundra converted the 02/05-15-008-29W1 producer to an injector. As of December 2017, Sinclair Unit No. 7 had 7 injection patterns in place, which includes the inter-unit injector at 03/01-14. In 2018, Tundra expects to convert the 03/05-15 and 04/12-15-008-29W1 existing producers to injectors.

Production performance by injector pattern are summarized in Appendix A.

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

The injection water for Sinclair Unit No. 7 will be sourced from the 16-32-007-29W1 well (Lodgepole formation). The water is treated at the 03-04-008-29W1 battery where it is filtered to 0.5 microns and has scale inhibitor added. The injection water is then distributed to the injectors through the dedicated infrastructure system.

Injection Wellhead Pressures

Injection started in this Unit in August 2013. The monthly wellhead injection pressure for each injector is summarized in Appendix C. Since injection in this Unit is still in the early stages, the injectors are still building up to a target injection pressure of 6300 kPaa.

Reservoir Pressure

Where practical, Tundra is committed to collecting pressure data from newly drilled wells. For Sinclair Unit No. 7, pressure data taken in 2012 and 2013 from 6 locations is available. A summary table is presented in Appendix B. Pressures are corrected to a common datum of -450 m SS for comparison with other units in the area.

Well Servicing

The following table summarizes the maintenance that was required in Sinclair Unit No. 7 during 2017:

Table 1: Sinclair Unit #7 Well Servicing

100.04-14-008-29W1.00	Pump Change	07/12/2017
100.05-14-008-29W1.00	Rigless Acid Stimulation	08/26/2017
100.10-14-008-29W1.00	Rigless Acid Stimulation	08/26/2017
100.13-14-008-29W1.00	Rigless Acid Stimulation	08/26/2017
100.05-15-008-29W1.00	Pump Change	12/08/2017
102.12-15-008-29W1.00	Rigless Acid Stimulation	11/06/2017
103.05-15-008-29W1.00	Pump Change	09/05/2017
100.16-23-008-29W1.00	Cemented Liner Clean Out	09/08/2017
102.01-23-008-29W1.00	Cleanout WIW	11/20/2017

Waterflood Performance Discussion

At the end of 2017, Sinclair Unit No. 7 had 7 injection patterns in place, including the inter-unit injector at 03/01-14. The patterns generally consist of an east-west horizontal injector placed between 8 vertical producers (line drive pattern), 4 to the north and 4 to the south. The 02/14-14-008-29W1 short horizontal location will remain a producer in this unit. It was drilled to improve oil recovery in that portion of the unit.

In 2013, the 03/01-14-008-29W1/0 and 02/04-15-008-29W1/0 horizontal locations were drilled as future inter-unit injectors. In August 2014, the 03/01-14 horizontal location was converted to an injector. Conversion of the remaining 3 future injection wells is anticipated to take place in 2018/2019.

Plots of the production and injection data along with the VRR information for each injection pattern is presented in Appendix D.

List of Appendices

Appendix A: Injection Pattern Summary

Appendix B: Reservoir Pressure Summary

Appendix C: Monthly Injection Pressures

Appendix D: Production/Injection Rates, Cumulative and VRR Plots for the following injectors:

03/01-14-008-29W1 (Inter-Unit Injector)

02/08-14-008-29W1

03/08-14-008-29W1

02/09-14-008-29W1

02/16-14-008-29W1

02/04-15-008-29W1 (Inter-Unit Injector)

02/05-15-008-29W1

03/05-15-008-29W1

04/12-15-008-29W1

02/01-23-008-29W1

Appendix A

Sinclair Unit No. 7 Injection Pattern Summary as of December 2017

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APPENDIX B

Sinclair Unit #7 - Pressure Summary

Location	Test Date	Final Pressure (kPaa)	MPP (mTVD)	KB	Datum Depth	Gradient	Pressure @ -450 masl
102/08-14-008-29W1/00	July 15 - Aug 31, 2012	2528.46	952.74	520.08	-450	8.25	2672
103/08-14-008-29W1/00	June 18 - Sept 6, 2012	2202.77	952.47	520.01	-450	8.25	2347
102/09-14-008-29W1/00	January 20 - 30, 2012	4088.56	951.37	519.87	-450	8.25	4241
102/04-15-008-29W1/00	June 26 - July 23, 2013	2429.12	956.10	519.35	-450	8.25	2429
103/05-15-008-29W1/00	June 28 - Aug 18, 2012	2107.99	956.86	519.77	-450	8.25	2214
102/13-15-008-29W1/00	Jan 28 - Feb 5, 2012	2792.92	957.82	519.87	-450	8.25	2892

Appendix C

	Average Monthly Injection Pressure (kPag)						
Month	103/01-14	102/08-14	103/08-14	102/09-14	102/16-14	102/05-15	102/01-23
Jan-13	-	-	-	-	-		-
Feb-13	-	-	-	-	-		-
Mar-13	-	-	-	-	-		-
Apr-13	-	-	-	-	-		-
May-13	-	-	-	-	-		-
Jun-13	-	-	-	-	-		-
Jul-13	0	0	0	0	0	0	0
Aug-13	0	0	0	0	0	0	0
Sep-13	0	0	0	0	0	0	0
Oct-13	0	0	0	0	0	0	0
Nov-13	0	0	0	0	197	0	583
Dec-13	0	0	0	0	1075	0	1637
Jan-14	0	0	0	0	1768	0	2526
Feb-14	0	0	0	109	2423	0	3190
Mar-14	0	0	0	784	2444	0	2919
Apr-14	0	0	0	3102	4335	0	4190
May-14	0	0	0	3136	4851	0	4806
Jun-14	0	0	0	2291	4781	0	4987
Jul-14	0	0	0	862	4366	0	4700
Aug-14	0	0	0	1523	5198	0	5283
Sep-14	0	0	0	2662	4614	0	6197
Oct-14	0	0	0	2275	4976	0	6276
Nov-14	-57	0	0	2785	4955	0	6169
Dec-14	-82	0	0	2919	3634	0	4872
Jan-15	-59	0	0	407	1144	0	2183
Feb-15	-86	0	0	-77	959	0	1969
Mar-15	-85	0	0	746	2497	0	3621
Apr-15	-86	0	0	2521	2640	0	6271
May-15	335	0	0	3335	4192	0	6124
Jun-15	1931	-4	18	3922	5479	0	6276
Jul-15	3852	-75	-83	4314	5938	0	6290
Aug-15	4631	-78	-86	4534	5928	0	6160
Sep-15	3838	-83	-88	4592	5475	0	5184
Oct-15	4476	362	-86	4832	6253	0	6276
Nov-15	4606	1649	-84	4985	6121	0	6226
Dec-15	4903	2587	380	4979	6178	0	6163
Jan-16	5008	2546	881	4930	6086	0	6279
Feb-16	5779	2978	2138	2049	6295	0	6279
Mar-16	5462	2758	2370	4367	6030	0	6086
Apr-16	5100	2989	2987	4976	6248	0	6258
May-16	6251	2991	2992	5583	6269	0	6282
Jun-16	6266	2991	2992	6104	6252	0	6279
Jul-16	6244	2986	2983	6257	6219	0	6267
Aug-16	6091	2970	2968	6168	6259	0	6263
Sep-16	6329	3103	2940	6072	6238	0	6264
Oct-16	6172	4633	4205	6075	6181	0	6220
Nov-16	6273	4974	4950	6274	6278	0	6272
Dec-16	6269	4958	4945	6275	6056	0	6072
Jan-17	4303	4928	4911	6243	6015	0	6132
Feb-17	3145	4976	5060	6273	6258	0	6273
Mar-17	4575	5714	5565	6273	6229	0	6263
Apr-17	5197	6201	6005	6273	6251	0	6274
May-17	5657	6231	6233	6254	6271	0	6280
Jun-17	6061	6271	6270	6299	6231	0	6274
Jul-17	4532	6265	6263	6275	6247	0	6258
Aug-17	2719	5455	5208	5517	4929	0	5738
Sep-17	5887	5651	5385	5463	4902	452	5543
Oct-17	5339	5273	4406	5286	4540	58	5235
Nov-17	6240	5960	4707	5784	6181	36	4794
Dec-17	6407	6455	5444	6290	6428	-90	1188

Appendix D

Rates and VRR Plots

Pattern: 03/01-14-008-29Inj Set: SinclairUnit#7

Oil Formation Vol Factor : 1.07100 m3/m3

Water Formation Vol Factor : 1.00150 m3/m3

Water / Oil Ratio : 0.28 m3/m3

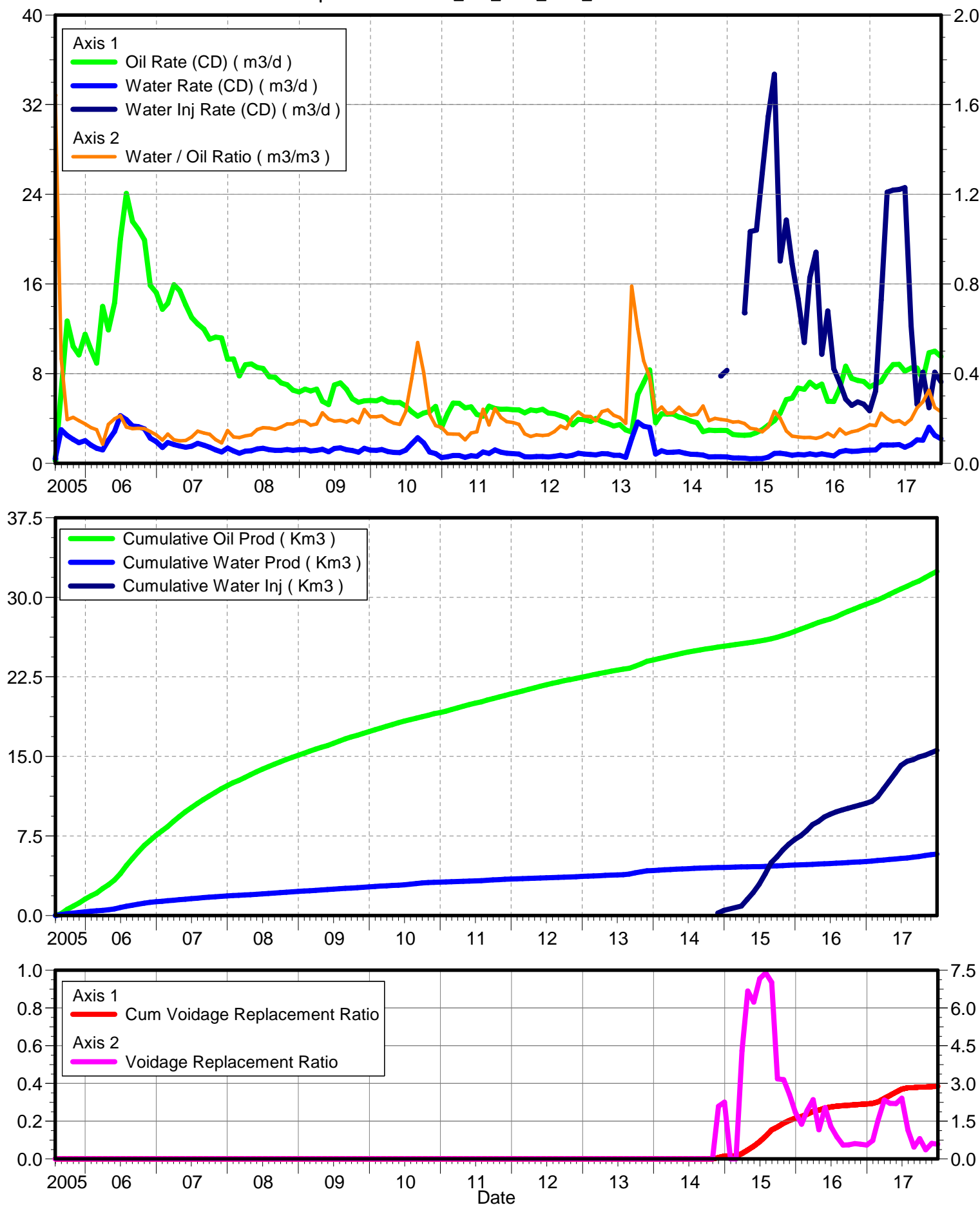
June 15, 2018

Operator: TUNDRA_OIL_AND_GAS_PARTNER

Oil Rate (CD) : 8.51 m3/d

Water Rate (CD) : 2.00 m3/d

Water Inj Rate (CD) : 7.04 m3/d



Pattern: 02/08-14-008-29Inj Set: SinclairUnit#7

Oil Formation Vol Factor : 1.07100 m3/m3

Water Formation Vol Factor : 1.00150 m3/m3

Water / Oil Ratio : 0.41 m3/m3

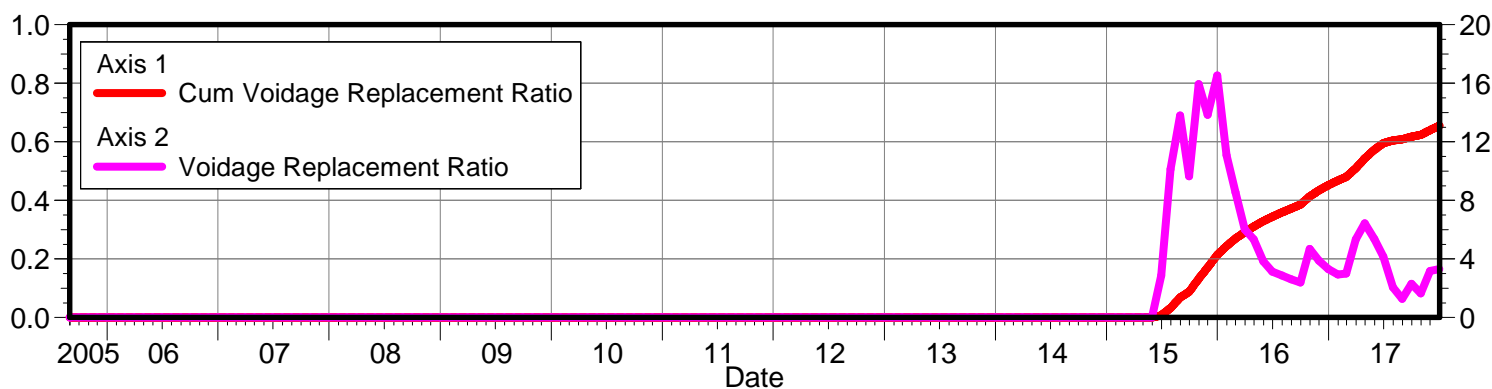
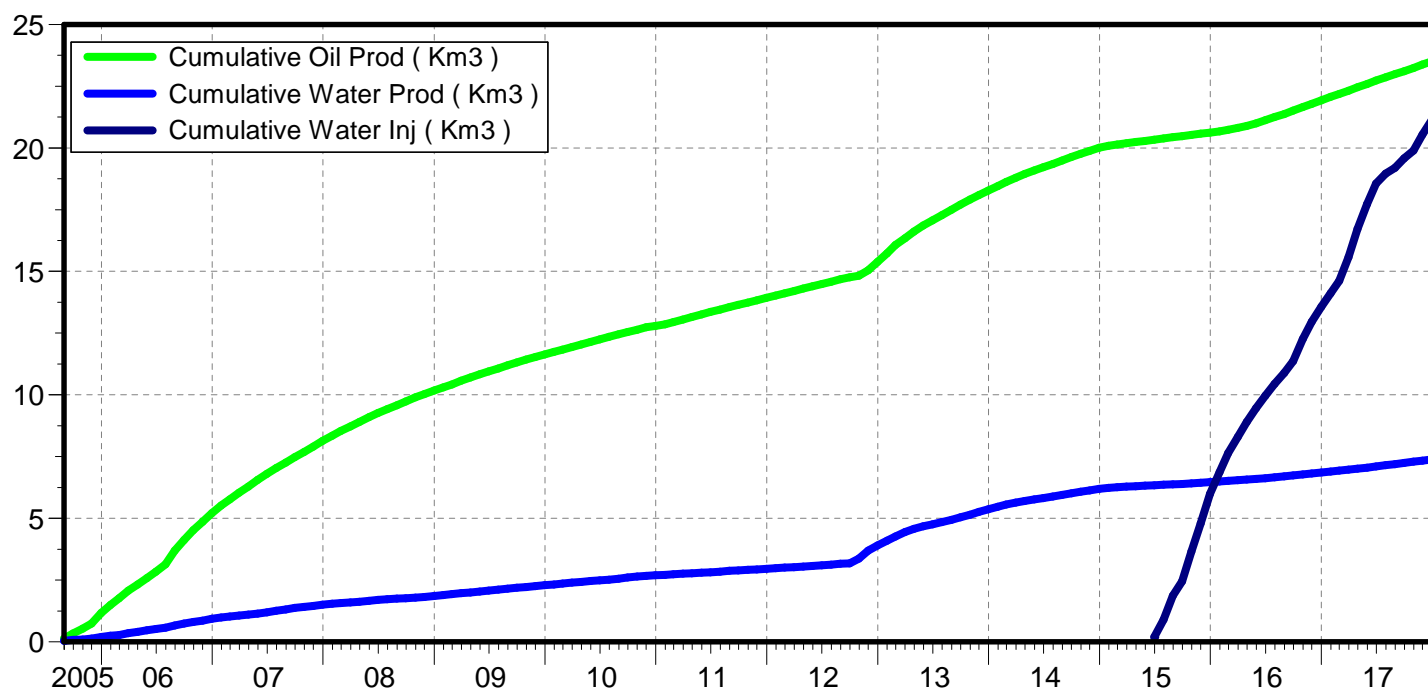
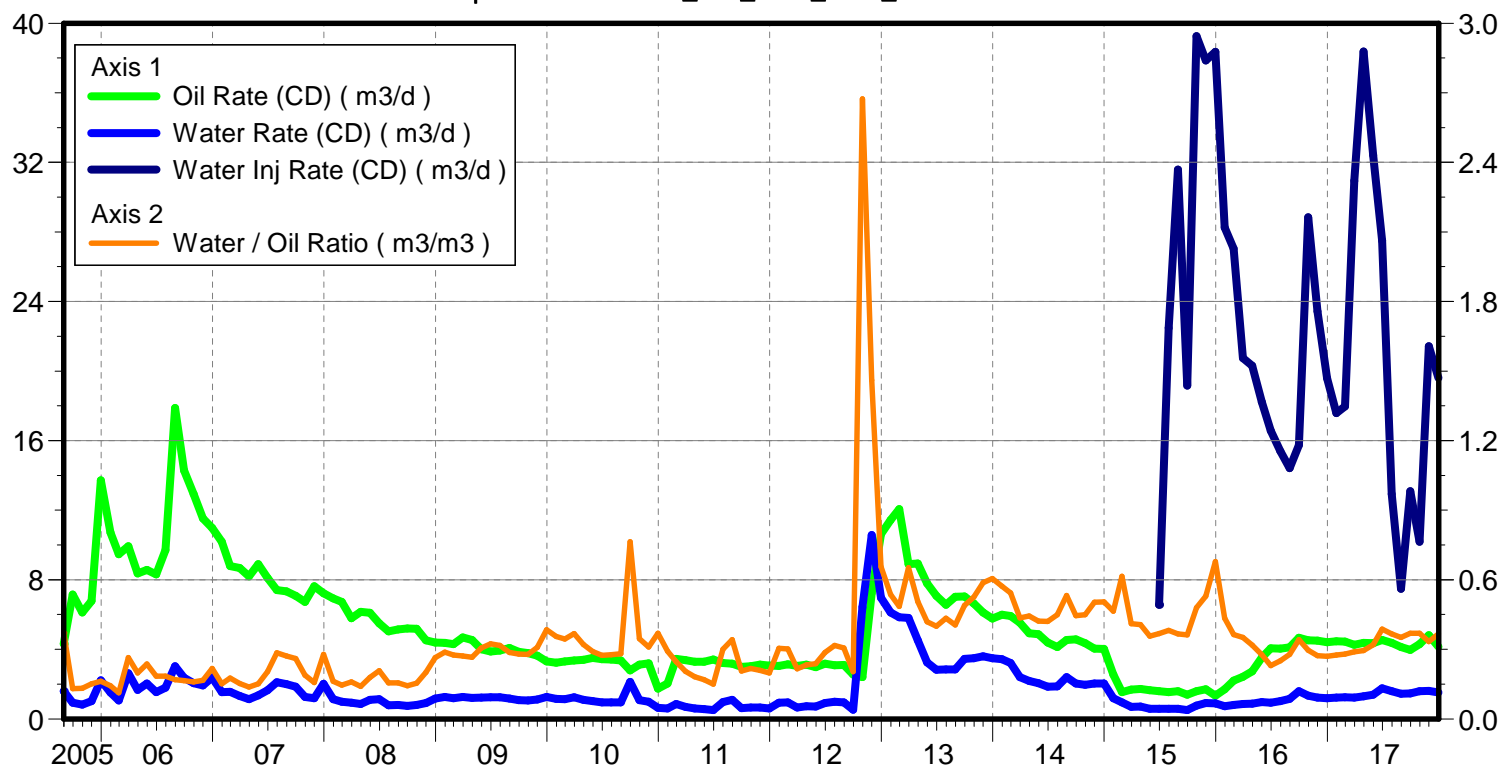
Operator: TUNDRA_OIL_AND_GAS_PARTNER

Oil Rate (CD) : 4.09 m3/d

Water Rate (CD) : 1.63 m3/d

Water Inj Rate (CD) : 15.86 m3/d

June 15, 2018



Pattern: 03/08-14-008-29Inj Set: SinclairUnit#7

Oil Formation Vol Factor : 1.07100 m3/m3

Water Formation Vol Factor : 1.00150 m3/m3

Water / Oil Ratio : 0.37 m3/m3

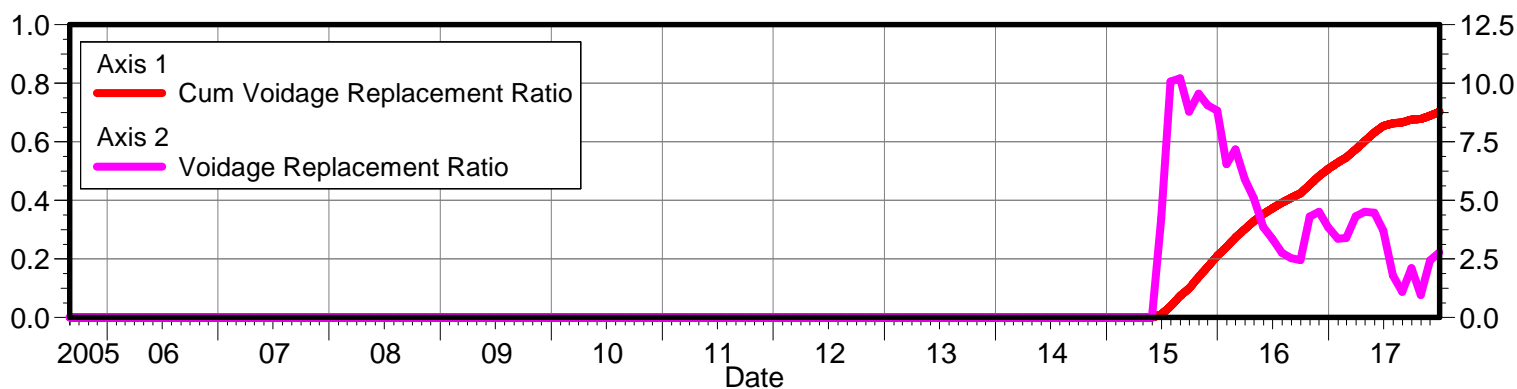
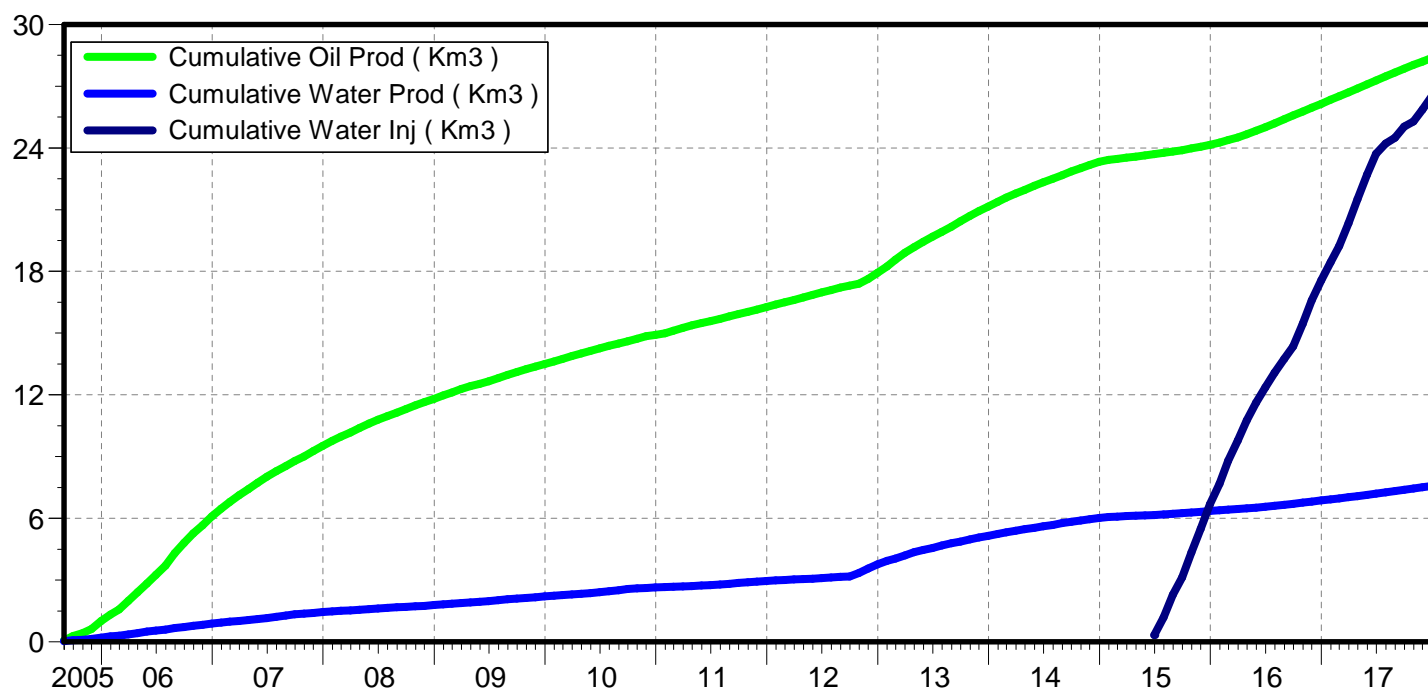
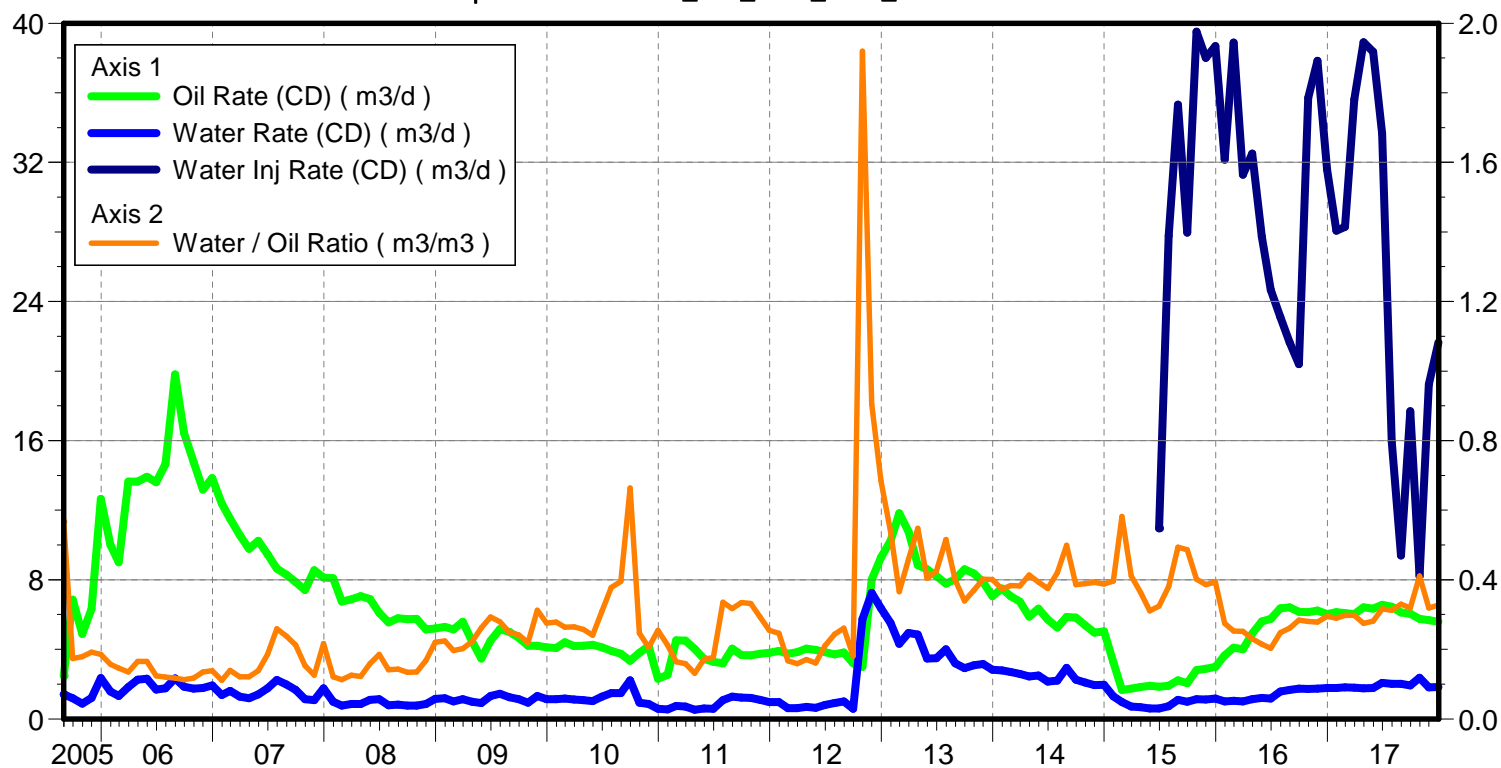
Operator: TUNDRA_OIL_AND_GAS_PARTNER

Oil Rate (CD) : 5.38 m3/d

Water Rate (CD) : 1.93 m3/d

Water Inj Rate (CD) : 23.64 m3/d

June 15, 2018



Pattern: 02/09-14-008-29Inj Set: SinclairUnit#7

Oil Formation Vol Factor : 1.07100 m3/m3

Water Formation Vol Factor : 1.00150 m3/m3

Water / Oil Ratio : 0.53 m3/m3

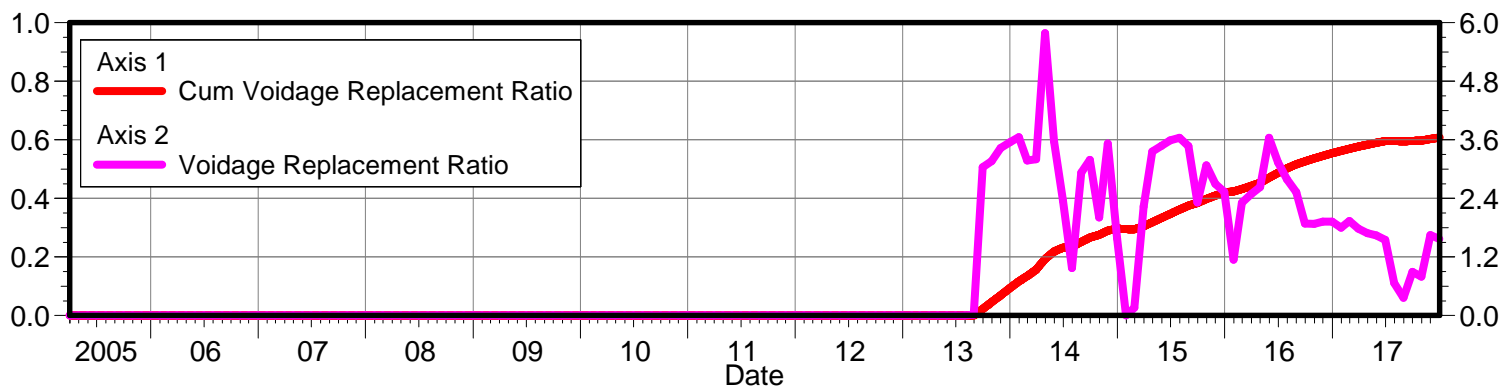
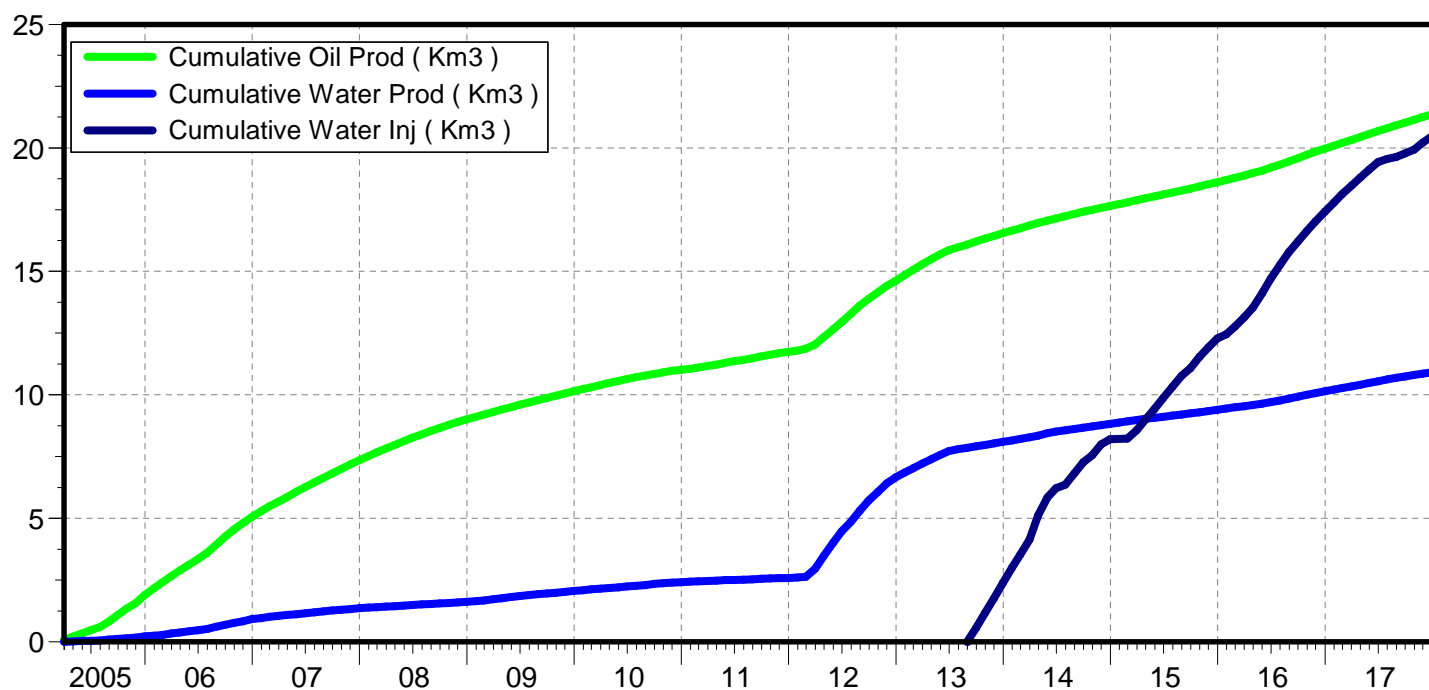
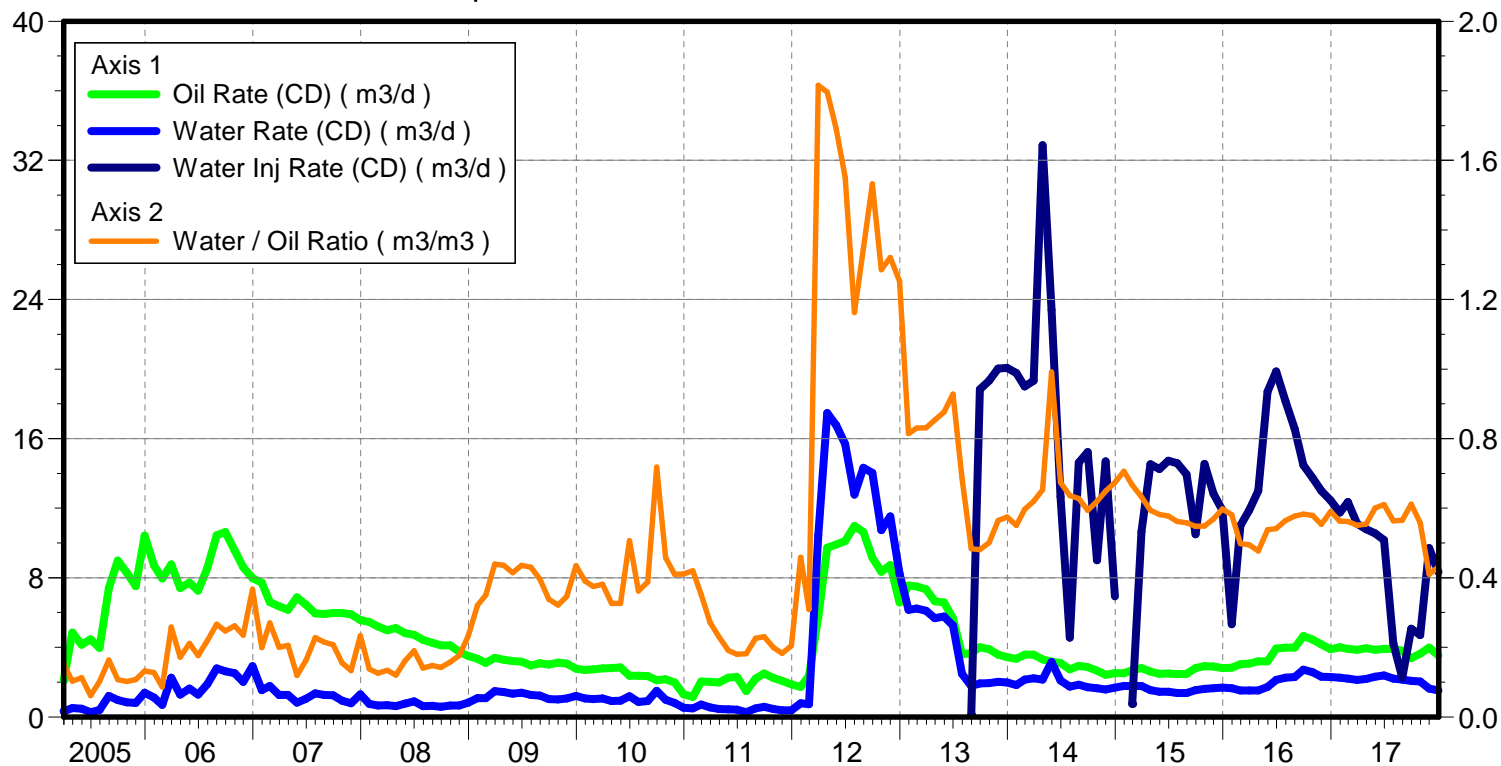
June 15, 2018

Operator: TUNDRA_OIL_AND_GAS_PARTNER

Oil Rate (CD) : 3.77 m3/d

Water Rate (CD) : 2.05 m3/d

Water Inj Rate (CD) : 7.68 m3/d

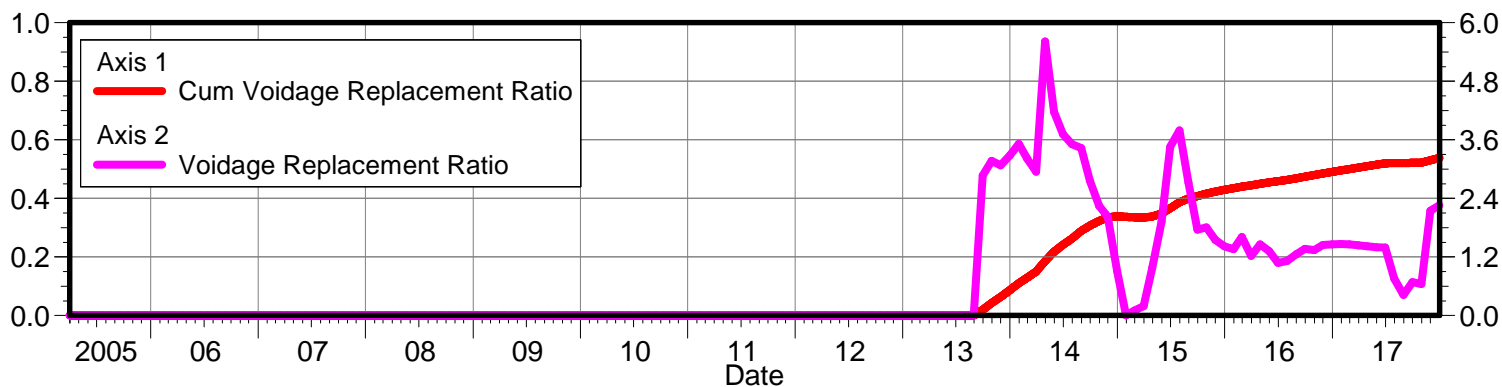
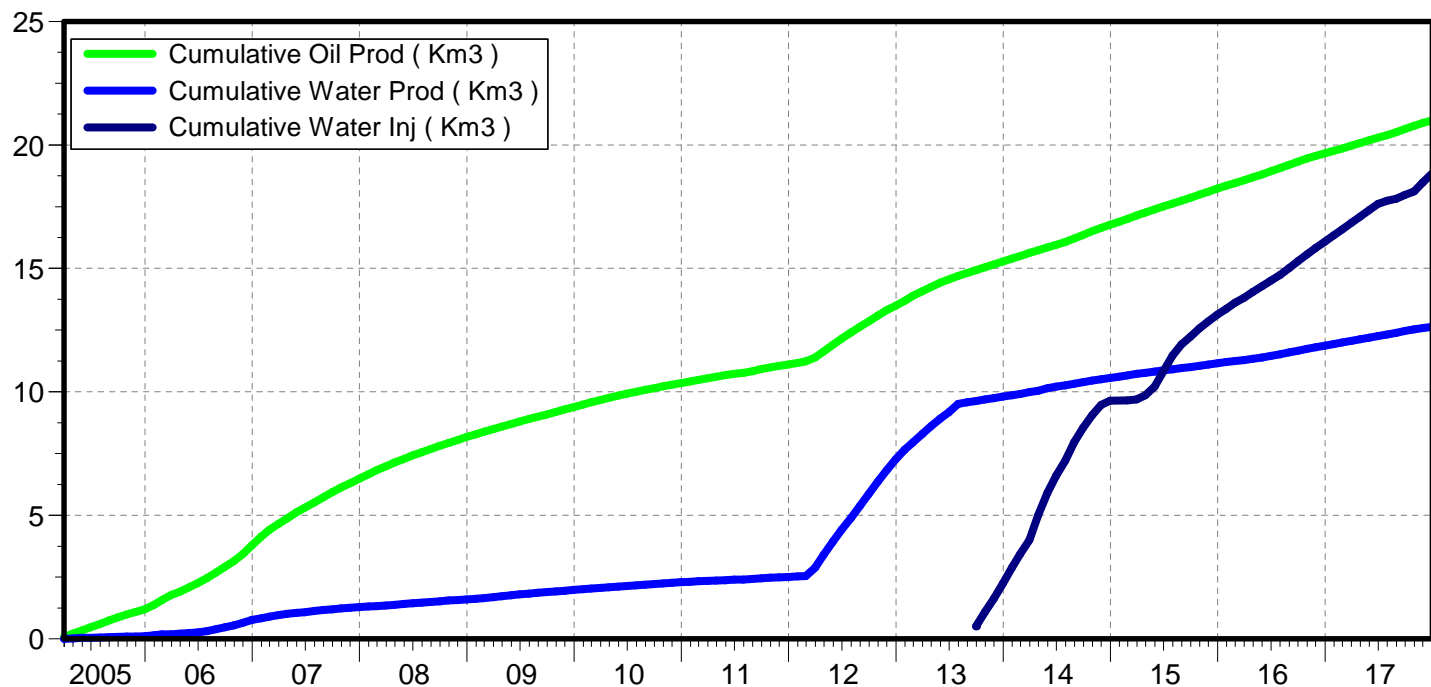
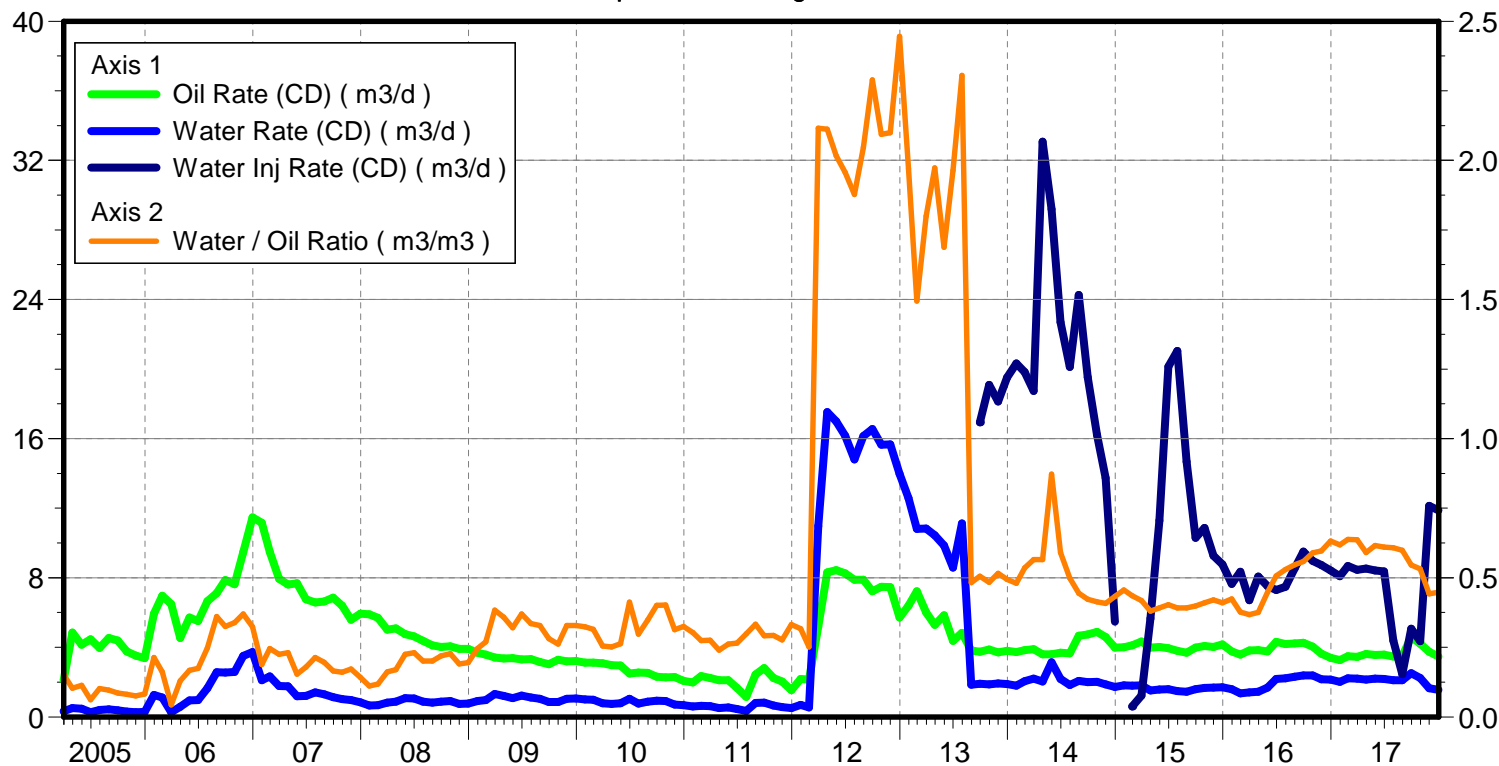


Pattern: 02/16-14-008-29Inj Set: SinclairUnit#7

Oil Formation Vol Factor : 1.07100 m3/m3
Water Formation Vol Factor : 1.00150 m3/m3
Water / Oil Ratio : 1.57 m3/m3

June 15, 2018
Operator: <Ambiguous>

Oil Rate (CD) : 3.44 m3/d
Water Rate (CD) : 1.82 m3/d
Water Inj Rate (CD) : 11.04 m3/d



Pattern: 02/04-15-008-29Inj Set: SinclairUnit#7

Oil Formation Vol Factor : 1.07100 m3/m3

Water Formation Vol Factor : 1.00150 m3/m3

Water / Oil Ratio : 0.44 m3/m3

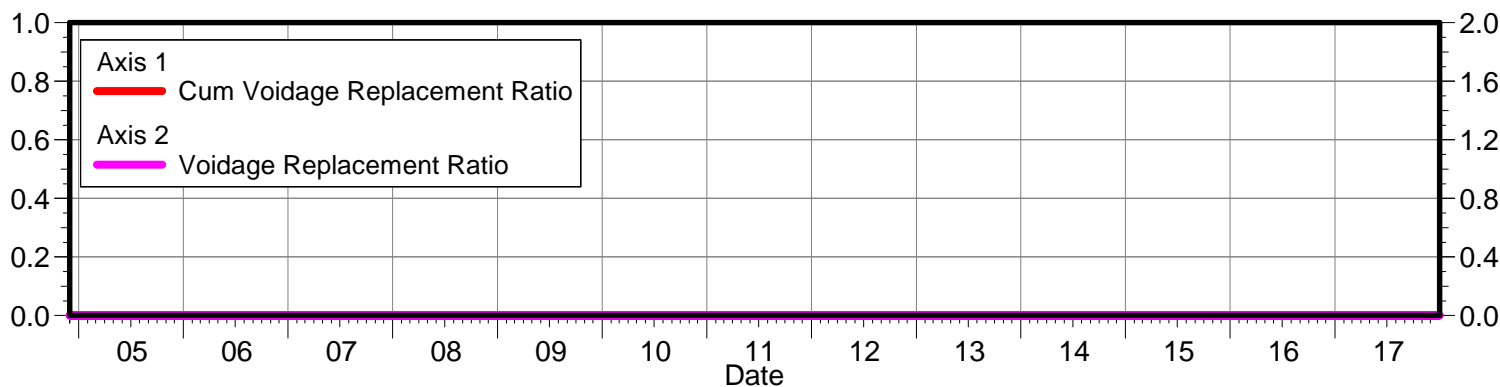
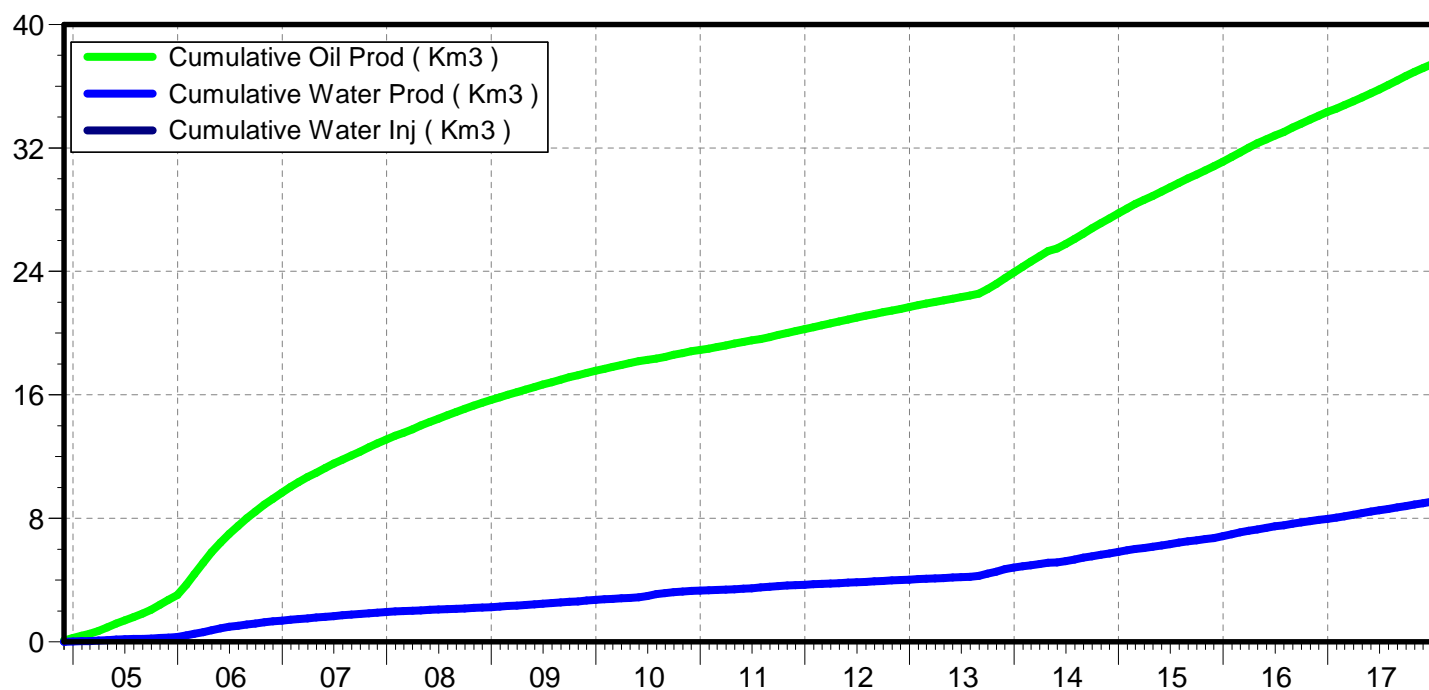
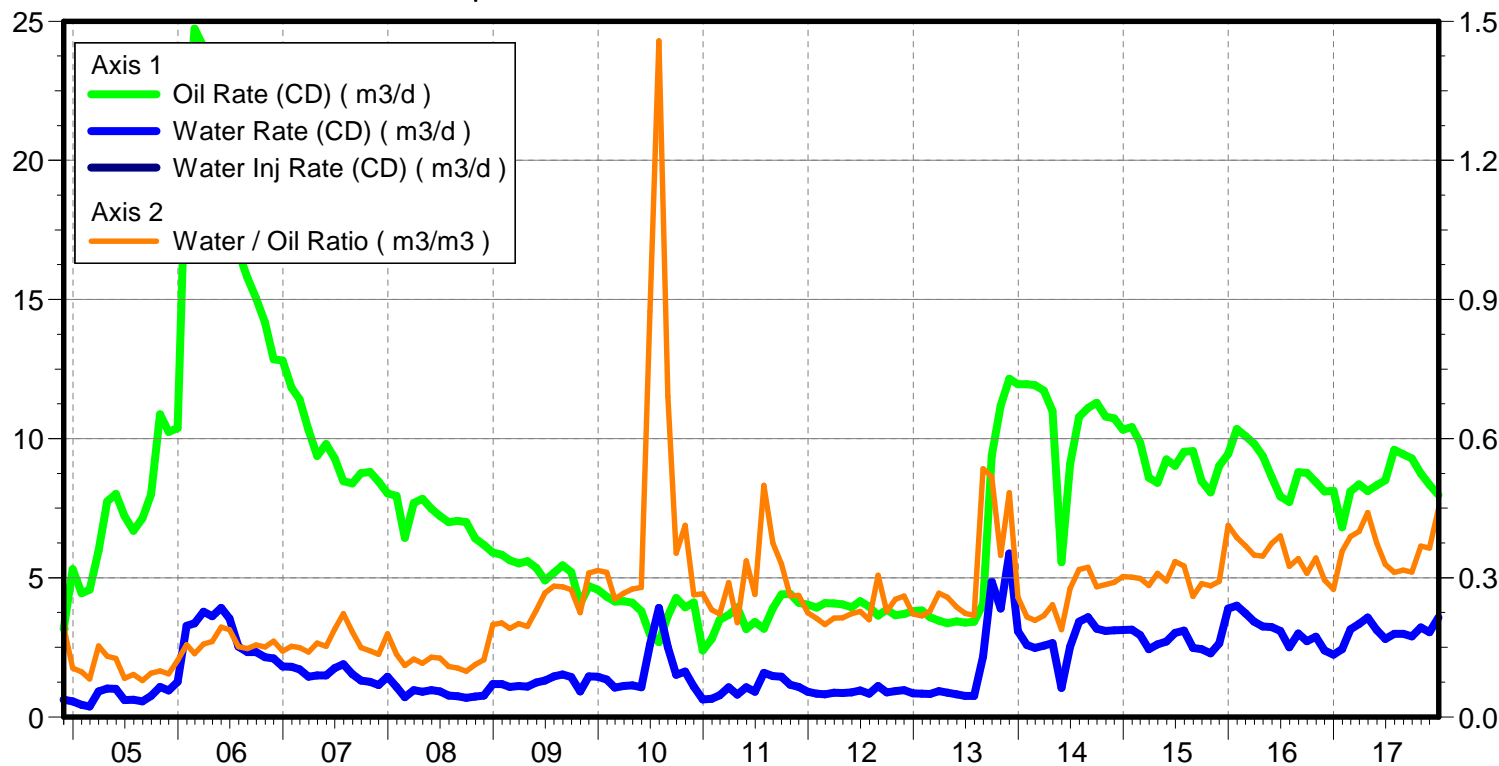
June 15, 2018

Operator: TUNDRA_OIL_AND_GAS_PARTNER

Oil Rate (CD) : 7.46 m3/d

Water Rate (CD) : 3.75 m3/d

Water Inj Rate (CD) : * m3/d



Pattern: 02/05-15-008-29Inj Set: SinclairUnit#7

Oil Formation Vol Factor : 1.07100 m3/m3

Water Formation Vol Factor : 1.00150 m3/m3

Water / Oil Ratio : 0.50 m3/m3

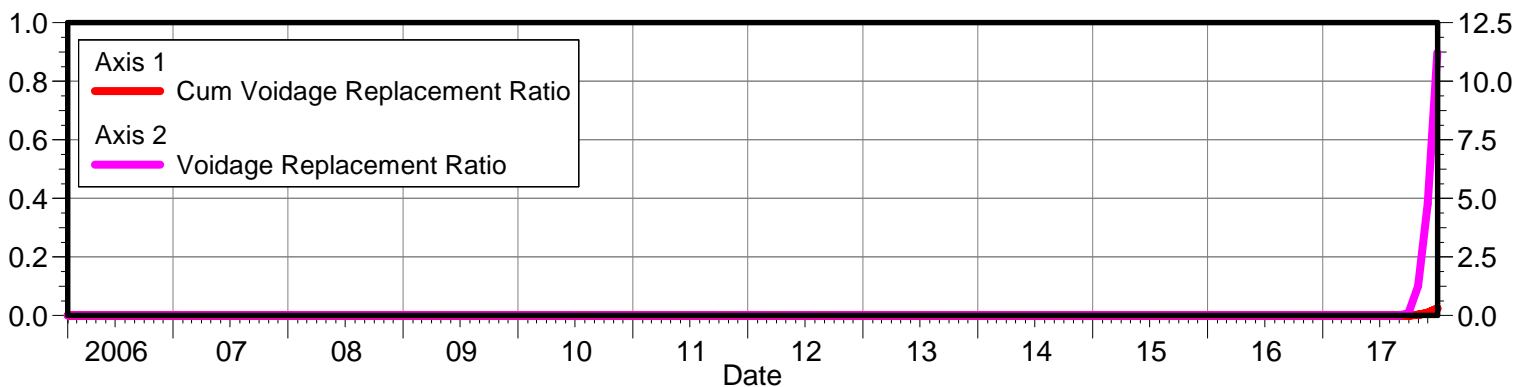
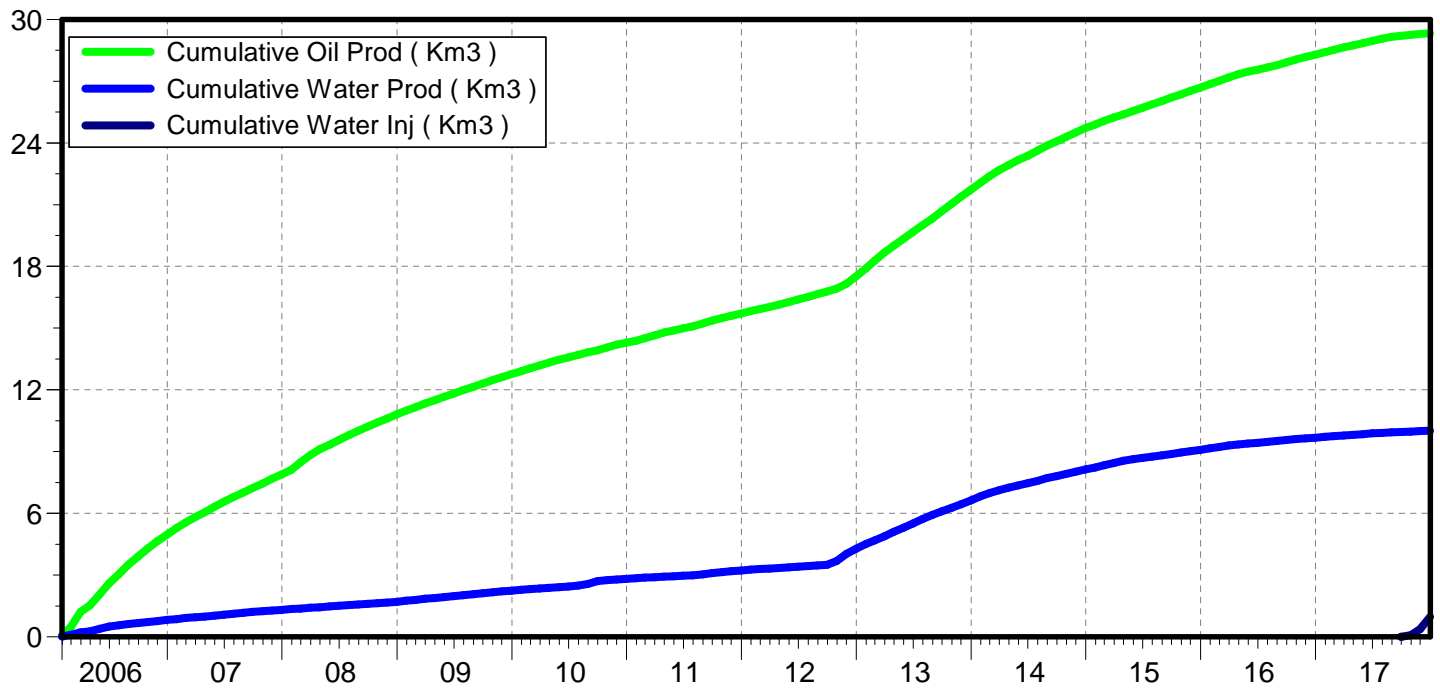
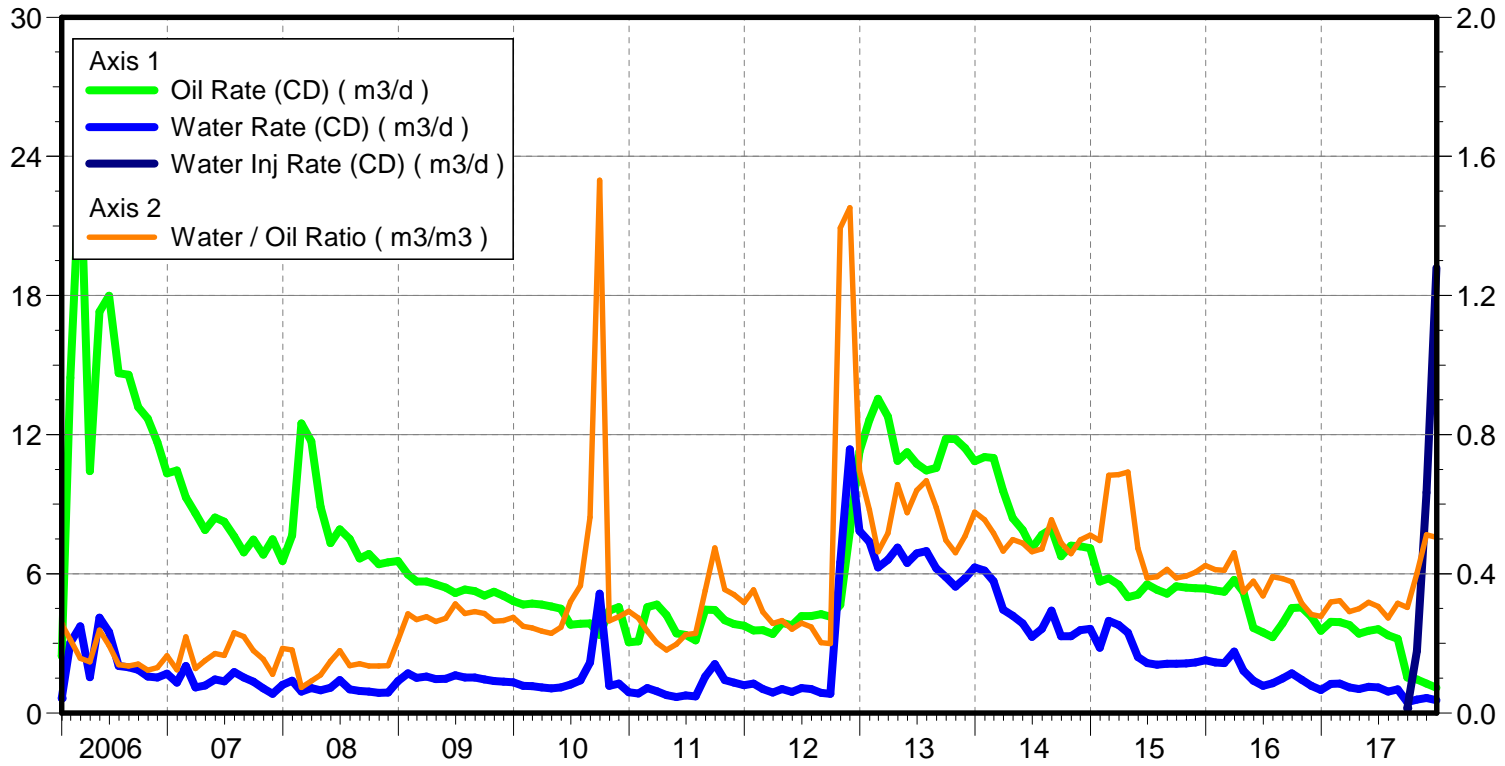
June 15, 2018

Operator: TUNDRA_OIL_AND_GAS_PARTNER

Oil Rate (CD) : 0.87 m3/d

Water Rate (CD) : 0.38 m3/d

Water Inj Rate (CD) : 36.89 m3/d



Pattern: 03/05-15-008-29Inj Set: SinclairUnit#7

Oil Formation Vol Factor : 1.07100 m3/m3

Water Formation Vol Factor : 1.00150 m3/m3

Water / Oil Ratio : 0.40 m3/m3

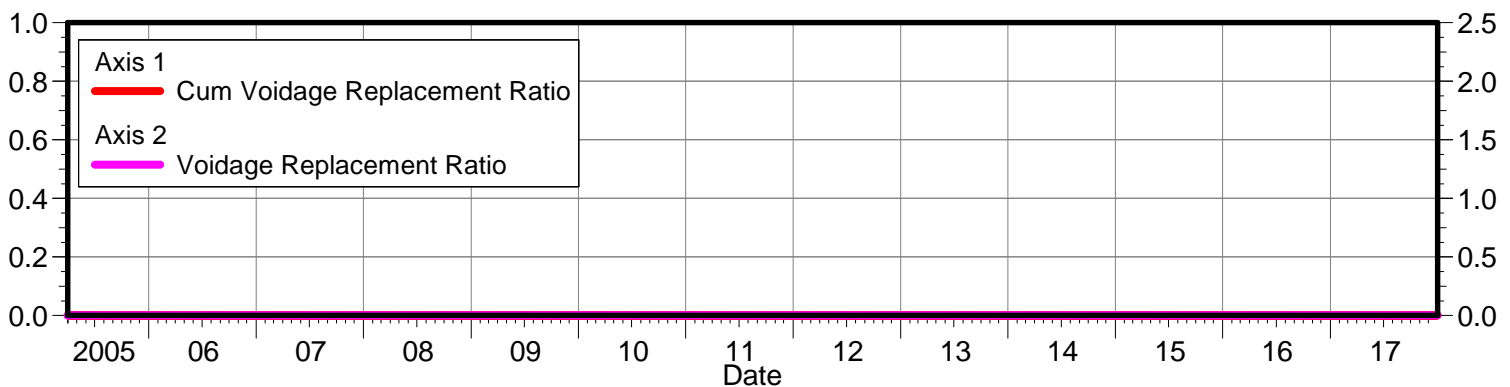
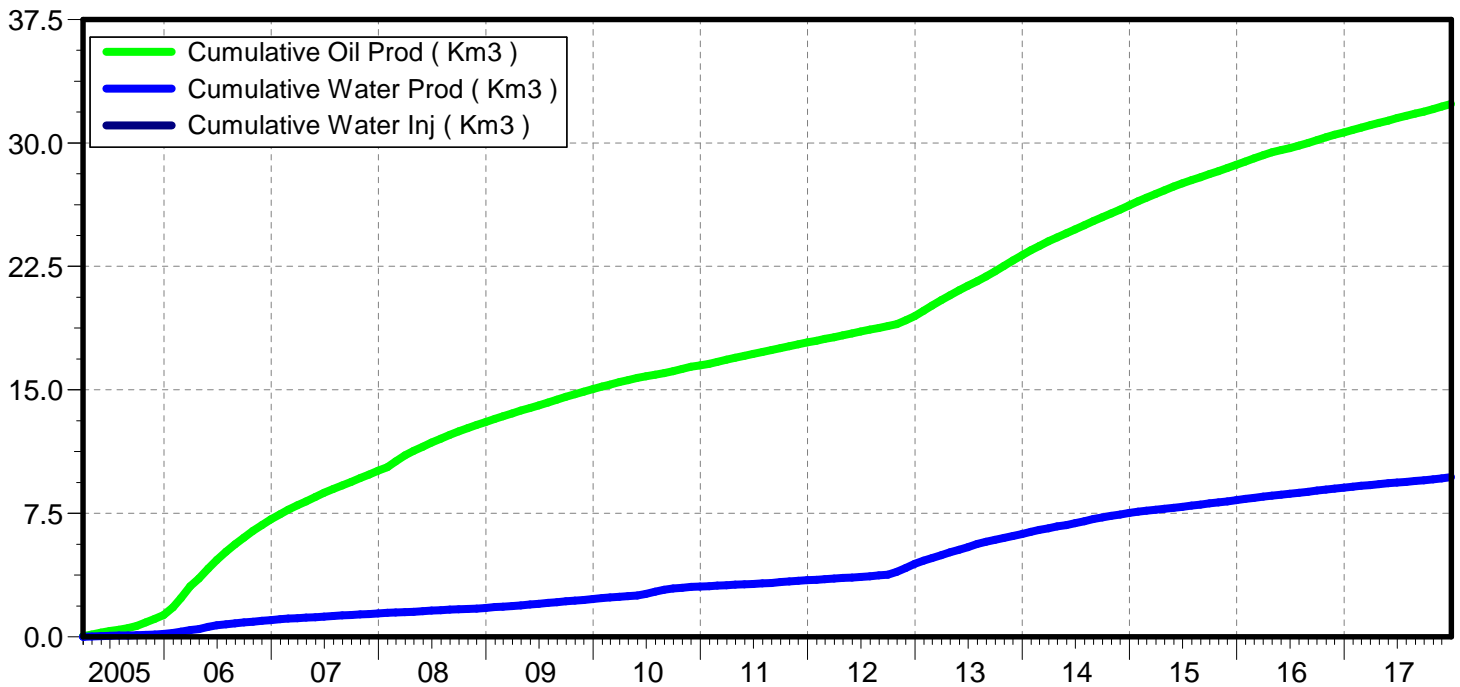
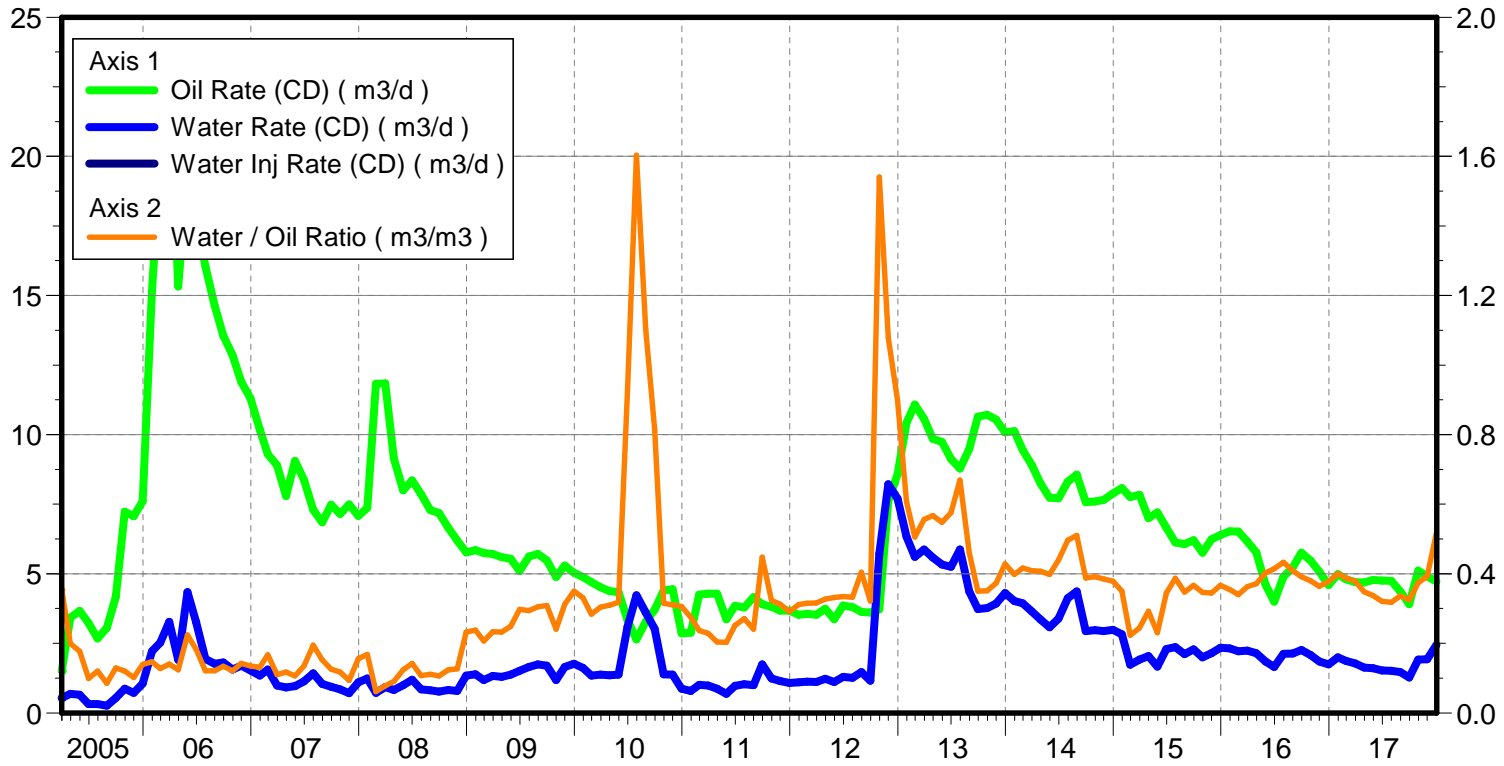
Operator: TUNDRA_OIL_AND_GAS_PARTNER

Oil Rate (CD) : 4.58 m3/d

Water Rate (CD) : 2.86 m3/d

Water Inj Rate (CD) : * m3/d

June 15, 2018



Pattern: 04/12-15-008-29Inj Set: SinclairUnit#7

Oil Formation Vol Factor : 1.07100 m3/m3

Water Formation Vol Factor : 1.00150 m3/m3

Water / Oil Ratio : 0.60 m3/m3

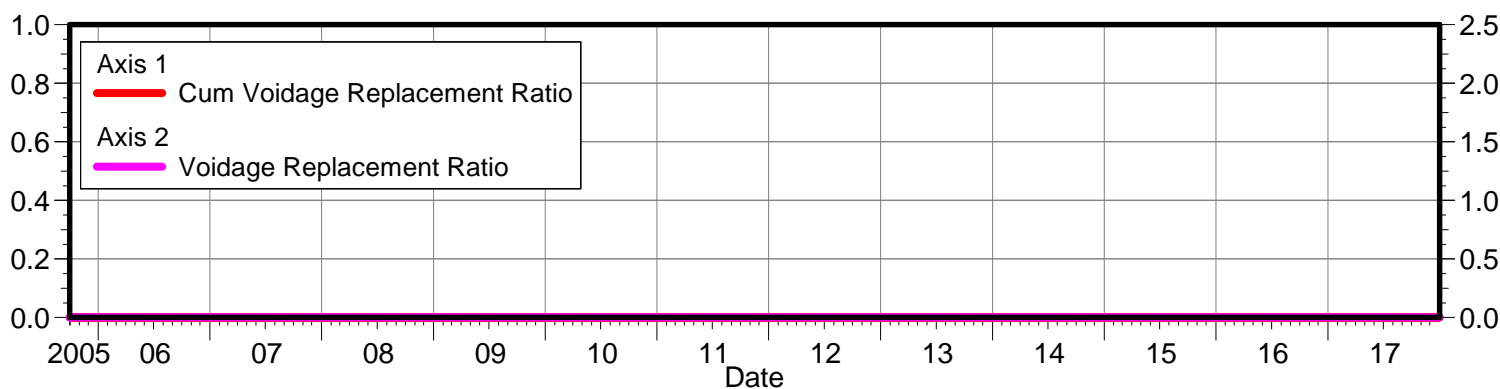
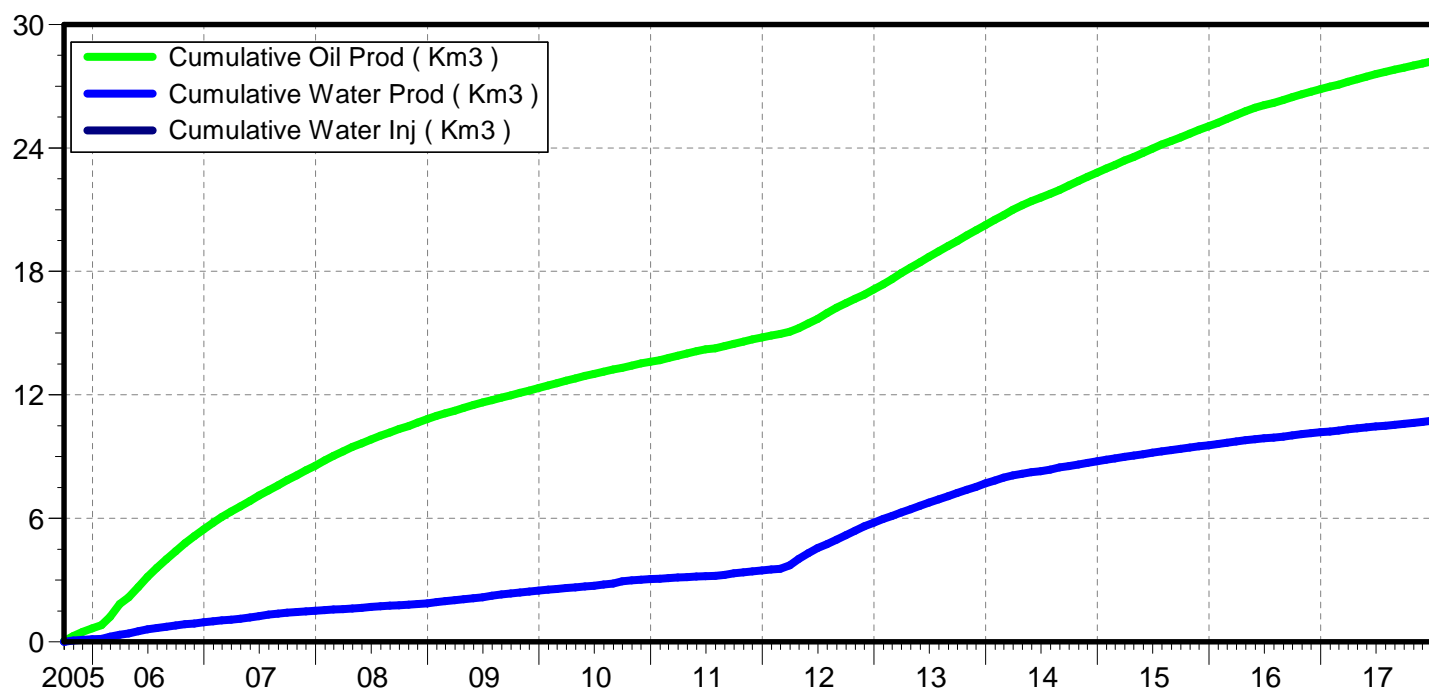
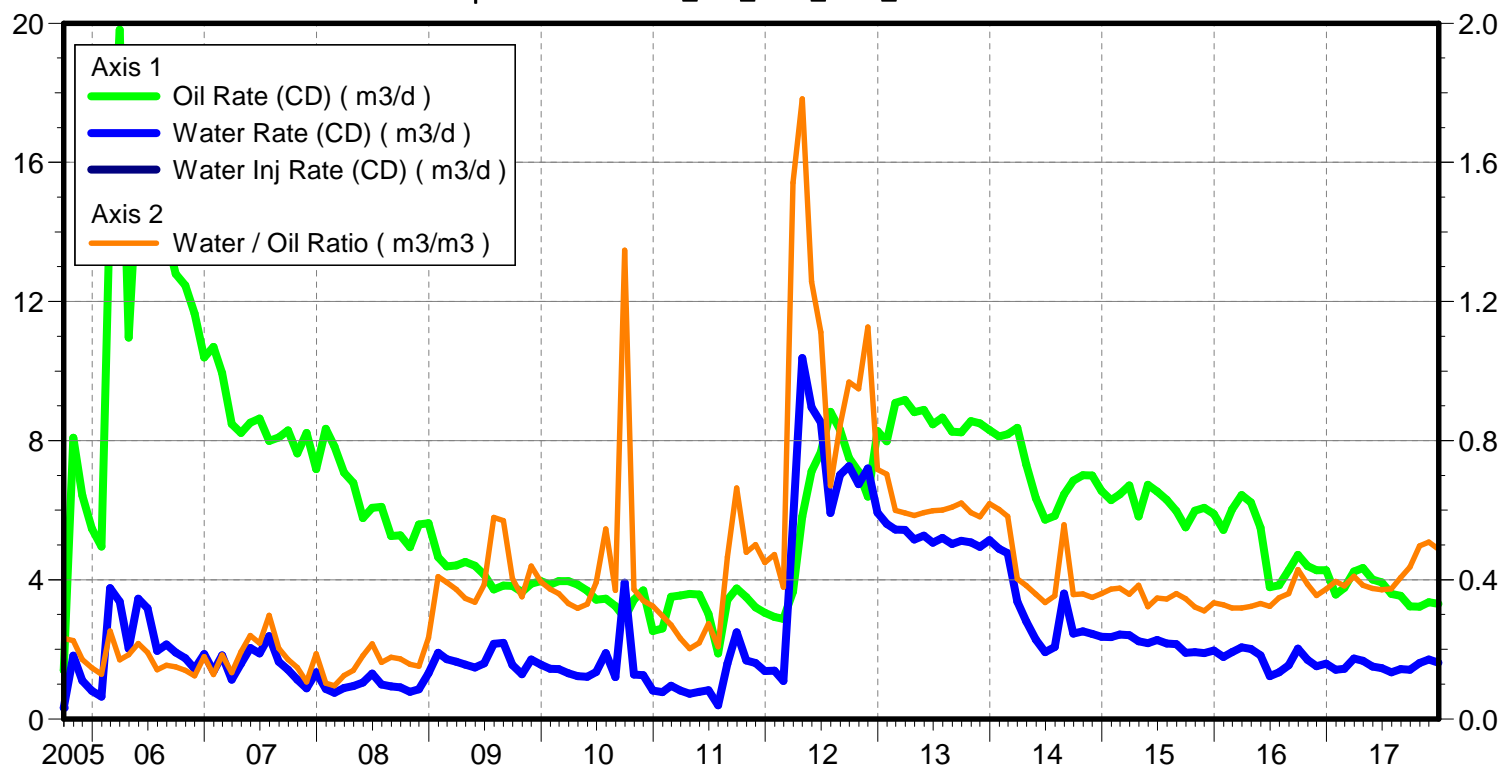
June 15, 2018

Operator: TUNDRA_OIL_AND_GAS_PARTNER

Oil Rate (CD) : 1.60 m3/d

Water Rate (CD) : 0.65 m3/d

Water Inj Rate (CD) : 1.04 m3/d



Pattern: 02/01-23-008-29Inj Set: SinclairUnit#7

Oil Formation Vol Factor : 1.07100 m3/m3
 Water Formation Vol Factor : 1.00150 m3/m3
 Water / Oil Ratio : 1.70 m3/m3

June 15, 2018
 Operator: <Ambiguous>

Oil Rate (CD) : 3.37 m3/d
 Water Rate (CD) : 3.61 m3/d
 Water Inj Rate (CD) : 30.79 m3/d

